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July 5-8, 2023 | Wageningen | The Netherlands

Transforming Consumption-Production
Systems Toward Just and Sustainable Futures



BOOK OF ABSTRACTS

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Wishing you a wonderful conference filled with insightful discussions and fruitful connections!

SCP23 Organizing Team

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A: Thursday, July 6, 11.00-12.15

A01: Beyond Growth: Structural Changes for Sustainable Consumption and Production

Session Chair: Oksana Mont

Room: B: Omnia, R: Podium (max. 269)

Financial innovations for sustainable economies and transformative social justice.

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Current financial systems are accelerating socially and ecologically destructive production and consumption cycles. Financial innovations are needed to transform societies and economies toward a more just and sustainable future. Integrating insights from sustainable transitions studies, climate justice and financial geography approaches, this research aims to address how transformative change can be achieved. In order to do so, this paper reviews and explores a range of financial innovations that are possible including those pertaining to central banks and monetary policy. This research shows that in financialized and debt-based economies central banks must be a part, and could be central, to sustainable transformation. The lack of attention to finance and financial innovation in sustainable production and consumption research is an area that requires urgent attention.

Barriers and Enablers of 1.5° Lifestyles: Shallow and Deep Structural Factors Shaping Lifestyles and Climate Governance

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Transforming consumption and lifestyles toward sustainability cannot be achieved by individual behaviour change alone but requires changes in the structures in which this behaviour is embedded. However, “structure” is a blurry concept and scholars use it in a multitude of ways. Recognising the need to mainstream lifestyles compatible with the targets of the Paris Agreement, we have conducted a literature review and a Delphi survey asking which structures can – directly or indirectly – be identified as impactful barriers or enablers of 1.5° lifestyles. We seek to bring more clarity into the blurry picture of structural factors impacting the sustainability of consumption and lifestyles by systematizing political, economic, technological, and societal structures the literature identifies as impactful. Conceptually, we do so on the basis of the material or ideational, as well as shallow or deep nature of structures. Thereby, the article throws light on the deep and opaque material and ideational structures lying underneath and shaping the sustainability impact of the more visible, shallow structures typically considered in public debates about sustainability governance. Shallow structures, according to our definition, are more specific and visible, have a narrower focus, and it is easier to identify specific responsible actors able to change them within the current power relations. By contrast, deep structures are broader, less discernible, and more difficult to change, and they potentially cannot be dismantled without changes in existing power relations. Our results show that shallow structures tend to support the pursuit of (green) growth, focus on technological efficiency and innovation to avoid unpopular practice changes, and they appeal to individual action and responsibility rather than broader political intervention in pursuit of structural change. Transforming deep structures would challenge taken for granted pillars of the current political and economic system, societal institutions and technological and innovation infrastructures, putting the spotlight on inequities and exploitative relations within societies and particular between the Global North and South. It would also involve a focus on provisioning for needs satisfaction for all within planetary and societal boundaries. We conclude that without changes in material and ideational, shallow and deep structures, households cannot necessarily be expected to make (or even have) sustainable choices and contribute to sustainability on the macro level. Our research, thus, highlights the need to consider and address these deep structures for any effective pursuit of transformation.

How can engineers help with a just and sustainable degrowth? Findings from an engineering department's degrowth colloquium

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#Problem statement. Engineers design products and processes to improve the human condition, and they do so within the constraints of the environment. Humans do not have unlimited access to resources, so engineers must design efficiently – getting the biggest benefit for the least amount of input and effort. This description of engineering may sound “green”, but it is increasingly clear that efficiency alone does not deliver global-scale resource demand reductions. The Jevons Paradox, rebound effects, and the intertwined nature of economic growth and ecological degradation have become key topics in the sustainability dialogue, and yet they feature little in engineering curricula. This leaves environmentally-minded engineering students grasping for answers to the question, what can we do?

#Research aim. At Purdue University, students and faculty from engineering disciplines are now holding a monthly Degrowth colloquium to open a space for dialogue on this topic and to collaboratively explore degrowth literature. Our work aims to develop a core of readings and discussion topics that allow engineers to confront the question, “What can engineers do about degrowth?”

#Theoretical approach. Degrowth scholarship has emphasized the need for innovation to bring about an alternative economic system, and we expect engineers will be a vital piece in the creation of that alternative. However, engineering education and training still rely heavily on thinking within a growth-driven paradigm of efficiency and extraction, limiting the tools useful for engineering alternative systems. Furthermore, degrowth thinking and scholarship has primarily come from social science disciplines. We establish our motivation for this work by reviewing the intersection of degrowth and sustainable technology literature, identifying the need for increased attention to engineering disciplines.

#Methods/inquiry approach. In this paper, we introduce methods for considering degrowth and post-growth concepts among engineers, and we present results from a survey of Degrowth Coffee Hour participants’ interest in the topic and ideas for further research and action.

#Findings. We find that engineering researchers are increasingly concerned that traditional environmental sustainability concepts such as energy efficiency and the triple bottom line do not deliver lasting impact reductions. There is a great need to acknowledge rebound effects and ecological spillover, and then to somehow control for these factors as technology is continually updated. Addressing this issue in the engineering disciplines is critical and urgent. If engineers are not exposed to alternative ways of thinking, it will hinder their ability to contribute to a truly just and sustainable transition of our energy and infrastructure systems.

#Conclusions & Scientific Implications. There is both an opportunity to expand the curriculum for engineers, and a strong desire for alternative paradigms/narratives from engineers-in-training and students. Based on our evaluation, we encourage academic institutions to meet this need by introducing alternatives to the “Faster, Cheaper, Better” narrative many students learn in undergraduate education. And we provide examples of how engineering education could incorporate more transdisciplinary and interdisciplinary perspectives specifically with connections to engineering—e.g., histories of engineering and economic expansion, social implications of engineering, and engineering within macroeconomic structures.

Post-growth sustainable agrifood systems: a SSCP research agenda

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Contemporary global agrifood systems harm the environment and are a major cause of the climate crisis. They are also entrenched in the patterning of dominant socio-economic systems, food culture, and social practices to create interdependencies that make them hard to untangle and reform. To date, most strategies for improving agrifood system sustainably have been largely superficial and fail to address the deeply rooted institutional, policy, and economic structures and logic that maintain the status quo. Profoundly changing agrifood systems to be sustainable will require an entirely different metabolism divorced from the paradigm of endless growth (McGreevy et al. 2022). Post growth food metabolisms will require prioritizing alternative values- sufficiency over efficiency, regeneration over extraction, distribution over accumulation, commons over private ownership, and care over control (ibid.). The good news is that many examples of post-growth food production, business models, culture, and governance already exist, but they can be isolated and still face myriad challenges. To fully take root, robust post-growth sustainable agrifood systems will need to entangle themselves into our societal imagination, social practices, and cultures of consumption and production.

This paper captures a series of perspectives from the SSCP literature and asks how research and action for post-growth sustainable agrifood systems can flourish. Sufficiency and well-being, reconceptualizing the “good life,” consumption corridors, alternative forms/modes of work, economic localization, creating room for *dépense*, alternative forms of governance, and the role of food technology—each of these themes is of critical importance to the realization of post-growth foodways and systems of provisioning. The paper explores these themes through the literature and offers a set of research questions to guide future research.

McGreevy, Steven R., et al. (2022) "Sustainable agrifood systems for a post-growth world." *Nature Sustainability* 5,12, 1011-1017.

A02: Moving towards a food-waste free world: Combining different approaches to reduce food waste

Session Chair: Ilona de Hooge
Room: B: Omnia, R: Quantum 1 (max. 30)

Reducing food waste of suboptimal products with authenticity and sustainability marketing strategies

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It is gradually becoming acknowledged that humans' use of natural resources exceeds the planet's possibilities (Steffen et al., 2015), making it essential to reduce our resource usage. The production of food requires extensive use of natural resources (FAO, 2013), and produces greenhouse gas emissions (Garnett, 2011). Yet, about one-third of all food produced is wasted (FAO, 2013; Parfitt et al., 2010), amounting to millions of tons of food being wasted yearly (Buzby & Hyman, 2012; Buzby et al., 2011). The reduction of food waste is therefore stated as one of the necessary world-wide actions for a more sustainable future.

One of the essential causes of food waste is supply chain actors' and consumers' unwillingness to sell, buy, or consume suboptimal products. These products diverge from the perfect standards on the basis of peripheral product aspects, such as appearance, but not on the basis of product quality or safety (De Hooge, 2021, De Hooge et al., 2017). Consumers appear unwilling to buy suboptimal products, which in turn motivates supply chain actors to remove suboptimal products from the production line. Therefore, motivating consumers to purchase suboptimal products would reduce food waste at all steps of the supply chain.

Yet, it is currently unclear how consumers can be motivated to purchase suboptimal products in ways that are also sustainable and financially viable for supply chain actors. Multiple studies have examined potential marketing strategies for suboptimal products, but they either have difficulties motivating consumers to purchase suboptimal products (e.g., Aschemann-Witzel, 2017, 2018), or difficulties motivating consumers in a way that supply chain actors would support (De Hooge, 2022; De Hooge et al., 2018; Raak et al., 2017).

The current research examines how consumers can be encouraged to purchase suboptimal products in viable ways for supply chain actors. We present two marketing strategies, namely sustainability and authenticity marketing strategies. The sustainability strategy provides consumers with information on sustainability aspects related to food waste of suboptimal products (e.g., "Embrace imperfection: Join the fight against food waste!"). The authenticity strategy highlights the product's genuineness, origin, or naturalness (e.g., "Naturally imperfect: Apples the way they actually look!"). In a series of three experiments, conducted in different European countries, we examined whether these two marketing strategies would affect consumers' quality perceptions of, and purchase intentions for suboptimal products. Compared to a situation without marketing strategies, both sustainability and authenticity strategies

appeared to increase consumers' purchase intentions for suboptimal products. In addition, the authenticity strategy increased consumers' quality perceptions of suboptimal products. Moreover, in two field experiments we examined whether the two strategies would increase suboptimal products sales. At both a local market and in a supermarket, sustainability and authenticity marketing strategies increased the sales of suboptimal products. Together, these findings reveal that sustainability and authenticity strategies can benefit suboptimal products, and can thus support the fight against food waste.

Exploring circular animal feed concepts from a consumer acceptance perspective

Siet Sijtsema, Anke Janssen, Mariet van Haaster-de Winter, Sandra van der Haar, Hilke Bos-Brouwers

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Transforming towards a more circular food system requires involvement of all relevant stakeholders. In the Dutch Public-Private Partnership (PPP) Project RENEW, farmers, feed production, resource management and catering companies, NGOs and researchers from both natural and social sciences joined up to develop new circular feed concepts. The aim is to develop an integrated food system design to valorise side flows from retail and food services as feed for non-ruminant livestock (poultry, pigs). Consumer acceptance is an important condition to develop these concepts that are economically attractive, beneficial to the environment and safe for animals and people alike.

A multi-method approach was applied to gain insights on awareness and attitudes of consumers towards animal feed practices and their conditions for acceptance of using side flows as ingredients for animal feed as well as their propensity to buy and consume meat and eggs from circular fed animals. In focus group discussions different variables that influence consumer acceptance of circular feed were explored. After that various concepts to communicate on circular-fed meat & eggs and their sustainability aspects were developed in co-creation sessions in which both consumers and food chain stakeholders participated. Finally, the attractiveness of these concepts, of what will and will not work was tested in a consumer survey (N=1500), launched by end 2022. During all stages of the research, all partners of the project closely collaborated in the design and interpretation of results. The qualitative and quantitative findings provided an overview of variables influencing consumer acceptance of circular feed, including a lack of knowledge and low interest in food and animal production systems in general and in feed production more specific. It also delivered insights on the effects of various ways to inform consumers on the use of circular feed, for example with regards to terminology used, and visual cues.

The results of the project contribute to the scientific foundation in support of the safe application of side flows as animal feed, by delivering new insights on consumer acceptance in combination with economic feasibility and climate impact.

The Food Waste Free-Week - building momentum with for reducing consumer food waste

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Consumers are the biggest wasters in the food chain. Agenda setting and awareness are important to get the consumer moving and to change behaviour. During the national Food Waste-Free Week, from 12 to 18 September 2022, millions of Dutch consumers took action against food waste. This campaign, organized by the foundation Food Waste Free United (Samen Tegen Voedselverspilling), The Netherlands Nutrition Centre (Voedingscentrum) and more than 140 partners inspired people to buy, cook and store waste-free. A wide variety of food system actors are open to cooperation in this area and private companies are actively tapping into this topic and momentum. Research shows that you can reach many people with this intervention and encourage consumers to take action.

The Food Waste Free United foundation is the public-private movement that is committed to SDG 12.3 in the Netherlands. Within Food Waste Free United all important initiatives and expertise against food loss and waste come together and are accelerated. Food businesses from the entire supply chain, knowledge institutions, national and local governments and ngo's collaborate on the ambition of halving food waste by 2030. The foundation maintains a joint, systemic and impact oriented approach with 'Target-Measure-Act' as a main principle.

The foundation organized several campaigns together with the Netherlands Nutrition Centre to positively inspire consumers to waste less food. Amongst others:

- Campaign about the difference between 'best before' and expiry dates and how to handle both dates.
- Campaign about bread, the most wasted product in Dutch households.
- National Food Waste-Free Week: organized with over 100 partners to inspire millions of consumers to buy, cook and store without food waste.

The 2022 edition was already the fourth time the national Waste-Free Week was organised. The goal of this week is to positively inspire Dutch consumers to buy, cook and store food in a waste-free manner. Partners were involved with contributions such as publicity in the national media, visibility in most supermarkets, posters at bus stops, socials and local activities. Moreover, hundreds of school classes join the Taste Mission Food Waste, and tools such as a fridge sticker and a food buddy are distributed throughout the country.

Also see: Food Waste-Free Week 2022, the Netherlands – Aftermovie (https://youtu.be/uY7xeBI7_Ug)

Social tipping points for a circular food system transition in cities– The case of urban organic waste

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Teresa Wolf, Trainee Global Sustainability, Melitta Group, Minden, Germany

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Cities as central collection points for organic waste offer great opportunities to valorize it into higher-value products than compost or bioenergy. However, urban organic waste currently mainly ends up in landfills, incinerators, or open dumps. As sociotechnical systems, cities are stabilized by regimes that coordinate the activities of actors and social groups creating inertia, lock-ins, and path dependencies in existing systems. It is, therefore, important to understand how transitions to a new more circular system occur and how socio-cultural, economic, ecological, and institutional changes react to each other and result social tipping points. The aims of this study are twofold. First, the relevant factors influencing organic waste valorization in cities and their interaction are identified and, second, the impact of changes in these factors contributing to tipping points for circularity are explored. Using Amsterdam as a case study, this study uses a fuzzy cognitive mapping approach to explore stakeholders' opinions about relevant system elements that drive a transition of the urban organic waste system towards circularity. In addition, the multi-level perspective (MLP) is used as a guiding theory of sustainability transitions to analyze the transition pathway and cluster the driving factors. For example, expert perspectives suggest that engagement in innovative waste valorization activities will remain in niches without industrial and political engagement. The financial returns from such technologies can only be achieved with large-scale production and waste homogeneity. The municipality of Amsterdam needs to take a leadership role in organizing a circular waste system and should promote exchanges between stakeholders and provide supporting data on waste composition and volumes. There is a particular need for industrial investors to integrate high-value technologies into circular business models. Regulatory or economic adjustments at national and EU levels can significantly impact this industrial engagement. The analysis of the expert opinions revealed ten different tipping points driving the circular organic waste system and showed that the transition process requires a change of attitude towards waste in all societal groups in order for the majority of society to support the shared vision of circularity.

Convenient tools and social norms: The effectiveness of an intervention to diminish household food waste

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Reducing food waste is one of the key sustainability targets, and food waste in households constitutes a substantial part of the issue. Effective interventions that decrease household food waste are urgently needed, and these could target various underlying behaviours such as planning, storing, preparing and consuming. However, theory-driven research testing such interventions are rare, and studies comparing different intervention options are especially lacking. Moreover, in testing the effectiveness of such interventions, possible influences caused by the measurement of food waste needs to be considered.

To address the calls for more intervention testing, and especially for testing interventions using a variety of information tools, we test the effectiveness of a tool package that includes tools targeting different stages of the food management process. Drawing upon the Motivation-Opportunity-Ability (MOA) framework, we expect that the effects of this tool-based intervention can be improved upon by the addition of motivational elements. The MOA framework claims that abilities, opportunities and motivations all need to be sufficiently present to spur behavioral change. Whereas the tool package directly addresses ability and opportunity barriers, motivational barriers may persist if not also addressed. Specifically, the current study examines the addition of social norm messages in the intervention, to test if effects are stronger when this element is present as well.

In addition to testing the tool package (with and without motivational messages), in a second study, we assess to what extent effects may be due to the action of measurement itself. Self-reported food waste measurements may increase the awareness of participants about the food that they waste, and may in and by itself potentially decrease food waste. Empirical evidence for such effects, however, is scarce.

We test our hypotheses in two experiments, where households receive a tool package and report food management behaviors and amount of food waste. Experiment 1 (n=150) had a 2-group design (tool package vs. tool package with social norm message, with pre- and post-measurement. Experiment 2 (n=279) used a Solomon four group design, manipulating the presence/absence of a pre-measurement and the presence/absence of the tool package. Findings of the studies show that the tool package significantly improves food management behaviours, and decreases self-reported food waste substantially. Effects on waste-preventing food management behaviours are stronger when social norm elements are added in the intervention. Results of the second study indicate that the effects are not due to measurement. Our results provide insights to policy makers about the effectiveness of interventions, and the added benefit of including social norm messages. Furthermore, our results indicate that the self-report survey measurement is suitable to assess the effects of interventions without having its own influence on food waste levels.

A03: Sustainable Prosumerism and the Circular Economy – Taking stock and moving towards new horizons

Session Chair: Thomas Smith

Room: B: Omnia, R: Quantum 4 (max. 30)

Does energy prosumption foster energy citizenship and energy democracy? A quali-quantitative study of two Renewable Energy Communities (REC)

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Renewable energy communities (REC) are rapidly spreading in the EU. Indeed, according to some studies by 2050 37% of European citizens will be involved in a REC (Kampman, Blommerde, and Afman 2016). From a sociological perspective RECs appear to challenge the passive role of consumers in the energy transition producing new forms of collective prosumerism. Indeed, consumers participating in energy communities collectively own through shareholding their renewable energy plants and thanks to the cooperative nature of many RECs they may play a more proactive role in decision making processes concerning renewable energy production (e.g. what plants to build, of which kind of renewable source, what size of the plant, where to locate it etc). Accordingly in the literature RECs have been recently related to the emerging and interlinked concepts of energy citizenship and energy democracy (Devine-Wright 2007; Wahlund and Palm 2022). However, these issues remain more assumed than proven. The risk has been raised that participants limit their role to investors rather than being willing to bring fundamental changes regarding how energy is consumed and produced (Islar and Busch 2016; Van Veelen 2018). Therefore, this paper aims to assess the potential of energy communities to bring about forms of energy citizenship and energy democracy. To do that we focus on two case studies of medium-large energy communities in the European Union- namely *ènostra* in Italy and *Ecopower* in Belgium- questioning the current practices of democracy and citizenship of their members. From the methodological point of view, we adopt a mix-method approach, conducting first an online survey (N=5402) and then complementing quantitative data with semi-structured interviews with their members and staff (N=20). The results show that consumer engagement can vary across members and remains complex. For example, some of the members present a low level of participation but develop at the same time other forms of engagement towards energy transition (e.g. retrofitting of their homes). A second result concerns the relationship between the two cases of cooperatives and the new wave of REC recently promoted by the new European directive (European Parliament 2018). Contrary to the recent emphasis on geographical proximity the cases considered show that the organization of prosumers in a community of interest rather than on a community of place can be an advantage. Cooperatives members feel strongly part of their communities and act as gatekeepers, diffusing energy

communities' models where they live and creating new territorial ramifications to foster energy transition.

Food prosumers in Almere: small-scale but omnipresent

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The concept of prosumption is as of yet not used much in the world of food. This is remarkable, as there have always been people who produce (part of) the food they consume. Moreover, literature that discusses alternatives to the global food system describes many forms of food production that would qualify as prosumption, such as community gardening, home growing, gleanings and foraging.

In this contribution we explore the usefulness of the concept of prosumption in relation to food. We start the presentation with a reflection on sociological conceptualisations of prosumption. We look at the work of Toffler and Ritzer, but also at literature discussing food self-provisioning – a concept that could potentially be termed prosumption.

Our empirical research was carried out in Almere, a medium-sized city in the Netherlands. We examined food prosumption by using an online survey (N = 835) and semi-structured interviews with prosumers (N = 12). We place these results in the broader context of Almere's new neighbourhood Oosterwold, where inhabitants are obliged to devote part of their land to food growing.

Prosumption is omnipresent amongst our respondents. Two thirds of them produce food for their own consumption in some way. Notably, however, this is often small-scale and little time consuming. More heavy forms of prosumption, such as community or allotment gardening, are much less present in our sample. Respondents have mostly personal and pragmatic reasons for growing their own food, such as the enjoyment of gardening and the pleasure of producing food. They are hardly motivated by profound concerns about sustainability or a wish to create a 'radical' alternative food system. Inhabitants of the urban agriculture neighbourhood Oosterwold can be divided into those who are highly committed to growing food, and those who do so because of municipal regulations.

Seeing the often pragmatic motivations for prosumption (e.g. fun, pleasure, regulations), we conclude that a pragmatic approach to the concept of prosumption in the field of food is more appropriate than sociological interpretations linking prosumption to such grand themes as power, capitalism and activism. While these last themes may be present and may link to other motivations, they should in no way be assumed.

This presentation will mainly focus on the session's proposed question 'Who are prosumers and what can be learned from them?', and to a lesser extent to the question 'What different understandings of prosumerism exist, and in which ways are these complementary or contradictory?'

Postcapitalist Prosumerism – The role of alternative production networks in sustainable economies

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What role do prosumers have in confronting the wicked sustainability challenges and re-shaping what has been called the 'imperial mode of living' (Brand and Wissen, 2021)? This presentation will address this question by pointing towards 'postcapitalist prosumerism': an increasingly prominent arena of ethical economic action, emerging to address some of the key unsustainabilities of contemporary society.

The presentation will trace conceptual debates around the meaning of prosumerism – from its origins up to the present day – before identifying some principles of postcapitalist prosumerism. These principles and characteristics will be illustrated with empirical examples from an ongoing Marie Curie Individual Fellowship project on 'alternative production networks' – networks which enable citizens and communities to come together to produce and manufacture for their own needs. These networks have risen to prominence in the wake of the production disruptions seen during Covid-19, but build on long pre-existing concerns in heterodox and sustainable economics.

Practice-centred prosumerism in a circular society: Opportunities and limits

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Current efforts in the European Union to establish a circular economy include proposals for the promotion of circular consumption practices. However, the nature of these circular consumption practices and their potential linkages with resurgent and newly emergent forms of prosumerism remains unclear. Social-scientific consumption research that deploys practice approaches and that focuses on the material and social elements of routine everyday practices can make a significant contribution to enhancing understanding the relationship between sustainable prosumerism and circularity. This paper presents conceptual and empirical insights from CircEular, a Horizon-funded European project that explores potential circular pathways for an EU low-carbon transition. Particular attention is paid to forms of prosumerism that focus on the provision and use of services in the context of housing and domestic resource use. The paper combines insights from practice-theoretical work on consumption with in-depth case studies of change initiatives in Germany and Europe that seek to (re-)connect the production and consumption of resources in households and that promote district- and community-level commoning practices to lower consumption and increase sufficiency. It will be shown that an over-emphasis on economic aspects of circularity has hitherto eclipsed the potential contribution of prosumerism and circular consumption in households and communities. This contrasts with novel conceptual approaches that advocate for a fundamental rethinking and radical redesigning of the relationship between production and consumption to foster everyday prosumerism. It is argued that new forms of practice-centred prosumerism harbour the potential to transform an increasingly digitalised and globalised system of production and consumption, thereby enhancing circularity to prevent ecological collapse. In particular, the paper identifies (infra)structural, social and cultural conditions that create conditions for domestic and community-level prosumerism and related forms of circularity that connect with existing everyday practices. The paper concludes with some recommendations for policy makers to enhance prosumerism and circularity across the European Union.

Circular Economy Infrastructure: why we need track and trace for reusable packaging

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Information and communication technologies are recognised to be sufficiently mature to support traceability for reusable packaging at large scale, however, issues of data management, data integration, trust and collaboration in this complex ecosystem remain under-explored. We suggest that Digital Passports and mandatory reporting could provide a way to audit and incentivise reuse of packaging, allowing governments to focus on prevention and framing packaging as an asset, rather than inevitably turning into waste after a short single-use cycle. Digital Passports can address business' concerns (or excuses) for not investing in reusable packaging from helping with determining affordability through measuring packaging lifespans; meeting health and safety standards through batch coding and evidencing cleaning checks; addressing reputational concerns through clear documentation on the environmental impact of reusable items; and making reusable packaging competitive through waste taxation that actually measures reuse and not weight. We explore Digital Passports, not simply as a technical intervention but as boundary objects that are useful in supporting collaboration, identifying points of miscommunication between key actors along the value chain, from misconceptions of health and safety regulations to a distinction between retailers and manufacturing brands appetite for investing in reuse. We aim to provide a solid foundation for future research on Digital Passports, the digital circular economy and reusable packaging to build. We also share recent applications, including reuse rates and life cycle assessments, of traceability supporting reuse in the UK.

A04: Critical Perspectives on Sustainable Consumption Discourse

Session Chair: Bas van Vliet

Room: B: Omnia, R: Quantum 2 (max. 30)

Values in policy: framing strong sustainable consumption?

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Understanding consumption as a super wicked problem, many argue an extremely urgent need for transitions, but also recognise the complexity in making change happen. Advocates for strong sustainable consumption emphasise that reprioritisation of values is a prerequisite for deep societal transformations, but there is a lack of understanding what this means, both theoretically and in practice. Addressing this ambiguity, the paper aims to explore how different values relate to different perspectives on transitions to sustainable consumption, and to investigate what values are mediated in the policy discourse on (sustainable) consumption in Sweden.

Researchers have identified three ideal-type positions in relation to sustainable consumption (e.g. improve/change/reduce), differing in their interpretations of what the problem is, what should be changed and how. Values shape such interpretations and the way sustainable consumption is enacted through policy and planning can be expected to, in turn, reinforce certain values. As current consumption practices uphold and perpetuate individualistic and power-centred so-called extrinsic values, this study departs from the normative assumption that intrinsic values are “deep transformation values” conducive to societal action and resilience, hence critical in enabling strong sustainability.

Approaching the Swedish policy discourse on sustainable consumption, the study draws on analytical categories used to characterise different interpretations of sustainable consumption transitions, such as scale and type of change, agency, and governance. The analysis is conducted on a selection of policy related documents, examined with reference to the analytical categories and coded with regards to the ideal-type sustainable consumption positions expressed. The emerging narratives (quotes) are then interpreted to understand what values are reinforced in the Swedish policy discourse on sustainable consumption. Preliminary findings indicate that “improving” consumption is associated with achievement, power and self-direction values (the two former falling into the extrinsic values category), “changing” consumption with universalism, benevolence and conformity values (the two former with intrinsic values connotations) and “reducing” consumption as having rather diverse associations spanning universalism, self-direction, conformity and tradition values.

The theoretical contribution outlines how values could be embodied and expressed (and, by extension, re-affirmed and enacted) within different positions on transitions to sustainable consumption. Illustrating this, the article also assesses the Swedish policy discourse to examine whether the national policy is conducive to strong sustainable consumption. Finally, the article discusses the role of values as an essential and critical component to be addressed in the strive for deep transformations.

Governance of the circular consumer: comparative policies in Ireland and Wales

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A key driver of global environmental change is increased material consumption (Wilk, 2002, Stephenson et al., 2010, Kirikkaleli and Adebayo, 2021) and as a result, many environmental governance frameworks aim to alter consumption practices. The circular economy (CE) framework has, in the past decade, become a key global environmental governance concept that relies on significantly restructuring both production and consumption systems (Catulli, 2012). However, existing research and policy focuses more on technical, theoretical and production-centric debates than the all-important consumption dynamics of the CE, leaving this area underexplored conceptually and empirically (Kirchherr et al., 2017). Despite the variety of CE policies and approaches applied through governance, the majority do not frame consumer involvement as anything more than an issue of awareness or acceptance (Camacho-Otero et al., 2018).

This paper presents research into how CE governance shapes the landscape of circularity that consumers interact, using Wales and Ireland as case studies. Preliminary examination of Welsh and Irish CE governance documents indicate differing approaches to framing the individual and their consumption practices, evidenced in different aims, roadmaps and policy instruments. These neighbouring countries have both developed environmental governance approaches within the wider EU framework. However, recent events, including Brexit, the EU Circular Action Plan and national-level governance shifts, mean that Irish and Welsh circular governance differ substantially. Using the circular discourse typology (Calisto Friant et al., 2020) and Foucault's definition of discourse (Foucault, 1991) as a frame, this work will critically analyse how the individual and their consumption practices have are constructed through CE governance approaches utilised in each country. This analysis will provide a unique insight into how the construction of circular consumption relates to the conceptualisation of the circular economy in each governance context. An enhanced understanding of how circular governance is constructed and then enacted would provide much needed critical and empirical knowledge into the social dynamics of circular economy governance.

Bibliography

- CALISTO FRIANT, M., VERMEULEN, W. J. V. & SALOMONE, R. 2020. A typology of circular economy discourses: Navigating the diverse visions of a contested paradigm. *Resources, Conservation and Recycling*, 161, 104917.
- CAMACHO-OTERO, J., BOKS, C. & PETTERSEN, I. N. 2018. Consumption in the circular economy: A literature review. *Sustainability (Basel, Switzerland)*, 10, 2758.
- CATULLI, M. 2012. What uncertainty? Further insight into why consumers might be distrustful of product service systems. *Journal of Manufacturing Technology Management*.
- FOUCAULT, M. 1991. *The Foucault effect: Studies in governmentality*, University of Chicago Press.
- KIRCHHERR, J., REIKE, D. & HEKKERT, M. 2017. Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, conservation and recycling*, 127, 221-232.
- KIRIKKALELI, D. & ADEBAYO, T. S. 2021. Do renewable energy consumption and financial development matter for environmental sustainability? New global evidence. *Sustainable Development*, 29, 583-594.
- STEPHENSON, J., NEWMAN, K. & MAYHEW, S. 2010. Population dynamics and climate change: what are the links? *Journal of Public Health*, 32, 150-156.

WILK, R. 2002. Consumption, human needs, and global environmental change. Global environmental change, 12, 5-13.

Can pro-environmental values lead to sustainable food consumption in the Global South

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As we face climate change and ecological imbalance at various spatial scales, pro-environmental values are becoming prominent and also seen as critical to driving sustainability transitions. Ample scholarly works show the significance of pro-environmental value-laden actions in driving sustainability transitions, and in most occasions, this premise holds. However, we see an exception when it comes to sustainable food consumption. This paper elaborates on how vegetarianism and veganism, a pro-environmental value based on biocentrism, fail to ensure sustainable food consumption practices. The transition from a non-vegetarian diet to a vegetarian or vegan diet is considered a pro-environmental value for two major reasons: 1. keeping in mind that animal products by industrial animal farming have high environmental footprints. 2. following the principle of reverence for life, sacrificing animals for consumption, or enabling industrial animal farming that induces animal cruelty calls for ethical actions toward animals.

Many times, these values have historical-religious roots, like how the ethical value of ahimsā that one finds in Jainism corresponds to these pro-environmental values, and in the discourse of green religion, Jainism is considered one of the earliest religions that had environmental ethics embedded in it. Here, I would like to put forth two arguments: 1. these pro-environmental values are not always beneficial for sustainable food consumption. With case studies from the Global South, I will illustrate how a pro-environmental value-laden shift in the diet a. leads to higher and often qualitatively different environmental footprints b. damages the local ecology and economy, c. raises diverse social justice concerns and thereby hinders attaining Sustainable Development Goals. 2. If there is a top-down intervention to implement these dietary shifts, it can adversely impact individual well-being and can create societal unrest.

However, there is no denying that sustainable food practice is crucial for attaining sustainability, as food production contributes 34% of GHGs emissions. The last section of this paper proposes that focusing on a spatio-temporal consumption system based on a framework of community-based ethic might help us to achieve sustainable food practices. Through additional case studies from the Global South, this paper will establish the robustness and feasibility of this proposal.

The process of social institutionalization of air travel and its determinants: the case of two Polish metropolitan areas

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This study expands our knowledge of the social institutionalization of flying and the social determinants and inequalities related to using air flights through a representative survey (N=4150) conducted in two urban agglomerations in Poland (Poznań and Tricity) between November 2022 and February 2023.

Air travel is one of the social practices that exert a particularly strong and rapidly growing impact on climate, while the share of its benefits and costs is very unevenly distributed (Büchs & Mattioli, 2021; Gössling & Humpe, 2020). The existing studies have provided knowledge about the correlates of high intensity of flying and associated emissions, particularly income and other basic socio-demographic characteristics (e.g. Büchs & Mattioli, 2021); living in cities, especially their centres (e.g. Czepkiewicz et al., 2018); having good access to airports (Bruderer Enzler, 2017); dispersed and international social networks and migration backgrounds (Mattioli & Scheiner, 2022), and cosmopolitan or global identity (Oswald & Ernst, 2021).

Taking these factors into account, this study also examines social and biographical processes fostering the emergence and persistence of flying practices. Drawing on Frändberg's (2006) and Mattioli's (2016) work we understand institutionalization as the embedding of regular use of flights in everyday life where they become a normal and legitimate way of carrying out certain activities. In this process, air flight turns into an essential need satisfier, which provides flying with a strong moral justification (c.f. Schmidt et al., 2023).

We analyze the advancement of the process of social institutionalization of flying (frequency of using flights as means of realizing different activities; assessments of the necessity to use flying for different activities and the difficulty of giving it up; habits associated with air flights). We examine social inequalities that relate to this process, including inequality in the share of associated GHG emissions. We also unpack the relationships between the degree of habituation of flying and:

- socialisation and experiences with long-distance travel at different life stages,
- accumulated mobility skills,
- social norms emerging around flying.

While responding to the need to study the role of habituation and socialization in institutionalizing long-distance travel practices (Mattioli, 2020), the presentation broadens the geographical and cultural scope of our knowledge. Poland is one of those countries for which the data on the institutionalization of flying is very limited, even though it has experienced a sharp increase in the intensity of air travel and its emissions for the last two decades.

This quantitative picture of the processes of institutionalisation of flying will be deepened by the qualitative research conducted in 2023-24, which will not be the subject of this presentation.

Democratizing Sustainable Consumption Governance – From Personal Sacrifice to Sustainable Limits

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Contemporary sustainability and climate governance frameworks, from the European Green Deal to the Sixth Assessment Report of the IPCC and beyond, have highlighted the importance of demand-side reduction strategies to provide essential breathing space needed to meet current climate targets in the short and medium term. In this context, the debate on policy and governance approaches to “sustainabilize” consumption and lifestyles has gained momentum, echoing strategies already promoted during the early 1990s (conscious consumer purchasing, eco-labelling, financial investments in household-energy efficiency, etc.) but also advocating more progressive tools and models (wellbeing economy, doughnut economics, degrowth, consumption corridors, etc.) to inform policy practice, also acknowledging structural problems of economic and democratic systems. However, and although the notion that “sustainability transitions must be organized democratically” is hardly disputable in many science and policy circles, we still lack knowledge about the extent to which “democracy” has been featured, thematically or analytically, in contemporary sustainable consumption debates.

While the well-established distinction between “weak” and “strong” sustainable governance approaches is useful to systematize and evaluate the proliferation of demand-side options, this paper argues that the role of the “demos”, or the democratic quality of the debated options, should be additionally invoked to rate their compatibility with societal trajectories (climate protests, right-wing populism, etc.) and especially to highlight the political process dimension (public acceptance, legitimacy, sustainable preference transformation, etc.). The paper constitutes a first attempt towards such a theoretical endeavour. To approach this goal, it revisits the consumption governance debates and discourses from the early 1990s until today, charting the development from a strong focus on individual responsibility and personal sacrifice to incorporating considerations of planetary boundaries, wellbeing, sufficiency, and the “good life” (i.e., sustainable limits). The analysis illustrates the extent to which scholarly contributions have addressed (or neglected) the democratic dimension in discussing demand-side options, with what consequences, and, by drawing on theoretical and conceptual work at the democracy-environment nexus, makes the case for its clear relevance and much needed consideration to support sustainable transformations in the field of consumption. Based on this overview, the paper selects promising governance approaches that at once clearly aim to reduce absolute material throughput, improve societal wellbeing, and devise explicit democratic pathways to get there.

A05: The Wellbeing Economy: Pathway to Consumption Sufficiency and a Post-Growth Economy?

Session Chair: Anders Hayden
Room: B: Atlas, R: Atlas 1 (max. 80)

The transformative capacity of wellbeing economics: comparing narrative strategies of the Wellbeing Economy Alliance and Wellbeing Economy Governments

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The reliance of current economic systems on economic growth is increasingly being questioned in the context of the climate emergency and rising social inequalities and conflicts. Political backing for post-growth initiatives has been limited to date. However, advocacy work by the Wellbeing Economy Alliance (WEAll) on the wellbeing economy aims to shift narratives around the purpose of the economy away from a focus on economic growth and led to the formation of the Wellbeing Economy Governments (WEGos) in Scotland, Iceland, New Zealand, Wales and Finland. Narratives are an important dimension of power (Fuchs 2016) and should hence be considered in studies on the transformative capacity of alternative economic approaches. Drawing on qualitative documentary and interview data, this paper compares narrative strategies employed by the WEAll and WEGos in relation to GDP as a measure of economic performance, economic growth as a policy objective, and capitalism as the underlying economic system. Analysing narratives around capitalism is important in this context because growth orientation is an inherent feature of capitalist economies.

Our findings identify disparities between the narratives put forward by the WEAll and WEGos. While WEAll promotes the deprioritisation of economic growth as a policy objective, WEGos remain more narrowly focused on complementing GDP as a measure of performance with other indicators. WEAll also explicitly questioned economic growth as a political priority while WEGos did not, focusing criticism on GDP as a measure. WEAll criticised several dimensions of the capitalist economic system and called for a transformation of the “system”, but rarely named capitalism directly. WEGos also criticised dimensions of the capitalist system but were less explicit in calling for system change. Findings therefore align with those by Hayden and Dasilva (2022) who argue that the WEGos have adopted a “‘weak post-growth’ approach” approach. Our paper adds to the literature by examining possible reasons for the divergence between WEAll and WEGo narrative strategies which we argue link more broadly to the hegemonic role of instrumental, structural and narrative power (Fuchs 2016) of the current growth-oriented capitalist economic and political system. Based on this analysis, we offer reflections on possible strategies that could strengthen the post-growth orientation of WEGo approaches.

This paper would fit well with the proposed session on The Wellbeing Economy as it addresses several of the questions raised in the session proposal, especially: “What lessons does the experience of Wellbeing Economy Governments (WEGo) provide about ability and limits of the wellbeing economy concept to take sufficiency-oriented, post-growth ideas into the political mainstream?” and “To what extent, and in what ways, does a wellbeing economy’s shift away from GDP as the primary indicator of prosperity toward a multidimensional understanding of wellbeing help advance a transformative approach to issues of consumption and sustainability?”

The contribution of Protected Needs to a wellbeing economy – an empirical inquiry into how adopting universal human needs and sufficiency in consumption are linked

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Rico Defila, University of Basel

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Achieving sustainability in consumption requires a societal transformation that is not limited to superficial changes of individual behavior. Rather, the required transformation has to reach down to the societal goals and paradigms, that is, to "deep leverage points" (Meadows 1999, Abson et al. 2017). The notion of a good life offers an alternative narrative to the current master narrative by suggesting to use the achievement of sustainable wellbeing for present and future generations as a societal goal instead of economic growth. To what extent this is feasible depends on whether it is possible to develop a theory of wellbeing that resonates to people, can be universally applied, and can be used to justify limiting consumption. This is the question that we will explore in our presentation.

We have developed the theory of Protected Needs (a theory of quality of life for the context of sustainability; Di Giulio & Defila 2020) and, together with other scholars, we have developed the concept of consumption corridors (suggesting to limit consumption with a view to ensuring wellbeing for present and future generations, or, in other words, a concept of sufficiency that is justified by wellbeing; Blättel-Mink et al. 2013, Defila & Di Giulio 2020). Both concepts are a potential fundament of a wellbeing economy. In a survey fielded in Switzerland, we have inquired into how both concepts are received in Switzerland, and we have started to explore how the two concepts are linked. First data analysis shows how people that adopt or reject the notion of universal human needs react to the idea of limiting consumption for the sake of wellbeing of others (Di Giulio & Defila 2021). In our presentation, we will focus on the following: A more in-depth analysis of the data and linking the results to the theory of change (Retolaza Eguren 2011) will reveal to what extent the theory of Protected Needs helps us to uncover characteristics of movers, floaters, and blockers of a wellbeing economy.

Abson, Fischer, Leventon, Newig, Schomerus, Vilsmaier et al. (2017). Leverage points for sustainability transformation. *Ambio*, 46(1), 30-39.

Blättel-Mink, Brohmann, Defila, Di Giulio, Fischer, Fuchs et al. (2013). Konsum-Botschaften. Was Forschende für die gesellschaftliche Gestaltung nachhaltigen Konsums empfehlen. Hirzel.

Defila, Di Giulio (2020). The Concept of "Consumption Corridors" Meets Society: How an Idea for Fundamental Changes in Consumption is Received. *JoCP*, 43, 315-344.

<https://doi.org/10.1007/s10603-019-09437-w>

Di Giulio, Defila (2021). Building the Bridge between Protected Needs and Consumption Corridors. *SSPP*, 17(1), 117-134. doi: 10.1080/15487733.2021.1907056

Di Giulio, Defila (2020). The 'good life' and Protected Needs. In Agni, Doris, & Anders (Eds.), *Routledge Handbook of Global Sustainability Governance* (pp. 100-114). Routledge.

<https://doi.org/10.4324/9781315170237-9>

Meadows (1999). *Leverage Points: Places to Intervene in a System*. Hartland, VT: The Sustainability Institute.

Retolaza Eguren (2011). *Theory of Change: a Thinking and Action Approach to Navigate in the Complexity of Social Change Processes*. Humanist Institute for Development Cooperation / UNDP.

Wellbeing Economy: Green and Inclusive Growth? Or a Breakthrough Beyond Growth to Sufficiency?

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Although there are strong arguments that a post-growth, sufficiency-oriented approach to environmental challenges is needed, it faces great obstacles in contemporary political economies with a widespread belief in the imperative of production and consumption growth. However, the idea of a wellbeing economy, which has roots in post-growth, post-consumerist thinking and efforts to move beyond GDP as a prosperity measurement, has found considerable support among mainstream political actors including governments and international organizations. Notable developments include the emergence of the Wellbeing Economy Governments (WEGo) and support for the wellbeing economy within the OECD and European Union institutions. Does the growing support for a wellbeing economy represent, as some observers have claimed, the long-sought breakthrough for a sufficiency-oriented, post-growth economic approach?

To help answer this question, we conduct case studies of two countries (Finland and Wales) that recently joined WEGo and another (Canada) that has participated in WEGo gatherings and developed its own wellbeing framework. The case studies are based on an analysis of documents (e.g. speeches and opinion pieces by government leaders, government budgets and related background documents, official documents outlining new “beyond GDP” wellbeing measurements, governing party policy statements, agreements on coalition government policy agendas) to assess the degree to which a wellbeing economy orientation has affected government policy priorities and particularly the orientation toward economic growth and ideas of sufficiency. In addition, the paper draws on an analysis of online content from the recently formed World Wellbeing Movement, which illustrates an additional way that the concept of wellbeing is being shaped to appeal to actors in government and business.

The presentation will build on and extend our initial analysis (Hayden and Dasilva 2022), which found, based on examination of the three founding WEGo nations (New Zealand, Scotland, and Iceland), that the emerging practice of the wellbeing economy involves efforts to achieve greener and more inclusive growth alongside a “weak post-growth” approach. Evidence to date indicates that governments with a wellbeing economy orientation are, to varying degrees, downplaying the centrality of economic growth as the overarching policy goal and moving “beyond GDP” by introducing new wellbeing measurements and using them in policymaking. In addition, a limited number of policies consistent with ideas of sufficiency are evident, which could potentially be built on and broadened. However, movement in a post-growth direction is limited by continuing dependence on economic growth as a means to achieve key intermediate goals, such as employment creation and provision of welfare state services, that are closely associated with the overarching goal of wellbeing. The paper will include thoughts on what would be required for the wellbeing economy to become a “strong post-growth” approach, while also pointing to developments that threaten to further water down the concept as it is mainstreamed.

Reference:

Hayden, Anders, and Clay Dasilva. 2022. “The Wellbeing Economy: Possibilities and Limits in Bringing Sufficiency from the Margins into the Mainstream.” *Frontiers in Sustainability* 3.
<https://doi.org/10.3389/frsus.2022.966876>.

Less to take care of: Interactions between wellbeing, sufficiency and consumption

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The climate crisis and the current energy crisis demand a shift on all levels - on the individual as well as on the political level. Concepts like "living better with less" as discussed by the sufficiency principle gain more and more relevance. The idea of a "better life" resonates with discussions of a well-being economy that goes beyond traditional economic indicators and addresses individual and societal well-being. For the present study, we define sufficiency as creating the social, infra-structural, and regulatory conditions for changing individual and collective lifestyles in a way that reduces energy demand and greenhouse gas (GHG) emissions and simultaneously contributes to societal well-being. Thus, to identify sufficiency-oriented lifestyles, we combined an output-oriented individual carbon footprint with well-being. The study's aim is to assess how consumption contributes to well-being and how well-being and lifestyles (with different levels of carbon intensity) are related.

We conducted an online survey with a total of 9500 respondents from five European countries (Germany, France, Italy, Denmark and Latvia). We applied a carbon footprint calculator covering heating, electricity, diet and motorized mobility as well as questions covering a variety of factors of well-being. In addition, we asked respondents about further aspects of consumption including (1) whether they possess appliances requiring a lot of energy, (2) the frequency of buying new clothes and (3) how often they flew. All data was referring to the year 2021 (including restrictions due to the pandemic). Based on the results of the carbon footprint calculation, we split the sample into three groups: individuals with a low carbon lifestyle, with an average carbon lifestyle and with a high carbon lifestyle. For each of these groups, we examined how well-being interacts with the carbon footprint of different sectors. In addition, we compared the groups regarding socio-economic and psychological attributes. Thereby, we examined drivers and barriers on the level of impact and well-being. Finally, we embed the findings in the national context and derive policy implications based on our results that can help to achieve a wellbeing economy - potentially with less consumption and more wellbeing - for everyone.

Provisioning for Sufficiency: Envisaging Production Corridors

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Presenter: Richard Bärnthaler, Richard.Baernthaler@wu.ac.at (in person)

This article deepens the framework of a sufficiency economy, which provides a vision to guide a post-growth wellbeing economy and defines sufficiency as the space between a floor of meeting needs and a ceiling of ungeneralisable excess. This framework can be applied to the domains of consumption and production. Complementing existing research on consumption corridors, our aim is to conceptualize the idea of a production corridor. To develop this notion, we survey a range of helpful concepts starting with objective and universal human needs to establish a “floor” and planetary boundaries to establish a “ceiling.” We then assess in some detail a range of conceptual debates that pertain to production: (1) Marxian categories of labour, (2) the production boundary, (3) provisioning and the foundational economy, (4) social reproduction, and (5) unnecessary labour. These debates permit us to start identifying essential production, which enables the satisfaction of human needs within planetary boundaries, and excess production, which contributes neither to need satisfaction nor human flourishing but drives planetary overshoot. This distinction further allows for an “in-between” domain of the economy, situated between the floor and ceiling. This discussion concludes with a more detailed model of production embedded in the framework of the sufficiency economy. We then “dynamise” this model to sketch a production corridor under climate-mitigation imperatives. It considers in turn the essential economy, the excess economy, and the in-between economy. The final section summarises our depiction of the production corridor leading to rapid but fair decarbonisation of the economy.

A06: Re-placing meat in current and future food practices

Session Chair: Arve Hansen, Johannes Volden, Ulrikke Wethal

Room: B: Omnia, R: Quantum 3 (max. 30)

Re-founding meat: From flesh to plant-based

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This paper builds on work in philosophy of science and technology to argue that emerging food biotech is creating new concepts of meat. Philosophy of science has been increasingly engaging with applied science and technoscience fields, including agricultural and food research. This is because scientific work itself is changing, responding to calls for societal impact, addressing grand societal challenges, and achieving sustainable development goals.

One key field of envisioned action -for science and society- is transforming the global food system. In the last fifty years, per capita meat consumption has, on average, across the world, doubled, while the earth's population itself doubled (Weis 2013). This quadrupling of meat consumption has relied on the technological intensification of livestock production and of systems of provision: leaving a significant ecological 'hoofprint' on the planet's air, lands and waters, and on other life, or biodiversity. Reducing the consumption of intensively farmed animals is thus key for reducing climate emissions. This paper explores how technoscientific work on 'alternative proteins' is changing ideas about meat as exclusively animal-based.

I have previously argued that everyday ideas can get transfigured into new scientific concepts, by being founded in scientific knowledge-making practices. These new founded concepts often keep their everyday names but work as scientific ideas sustaining and generating more science. For example, when economists measure 'wellbeing', they are not using some everyday idea of wellbeing to do this, but found a common idea in an epistemic-metaphysical-social context of economics, and articulate it as a new, founded, economics concept that they can operationalise and measure (Efstathiou 2016). But can founded concepts jump back to everyday life and how? This talk explores how founded concepts travel back to everyday life by examining meat and meat concepts.

I propose that this type of creative meaning-making is happening with ideas of 'meat' (and 'burger', 'mince', etc.) within food science and technology practices. Companies like Impossible Burger, Beyond Meat or, cultured meat company, GOOD Meat are founding everyday ideas of meat into novel plant- or cell-based food biotechnology contexts creating new founded, meat concepts. They do this through activities ranging from imitating the molecular properties of (animal-based) meat or growing tissue in a lab, to vision-statements and marketing matching the "good stuffs" of meat (Sexton 2016). Though the result here is not, or not only, found science but found meat. This paper shows how meat is founded in science but also re-entering the culinary practices of everyday life, bringing 'meat' back to the plate in new forms.

Keywords: meat, found meat, founded concepts, found science, food science and technology, Impossible Burger, Beyond Meat

References

- Efstathiou, Sophia. 2009. The use of 'race' as a variable in biomedical research. PhD diss. University of California, San Diego.
- Efstathiou, Sophia. 2012. "How ordinary race concepts get to be usable in biomedical science: An account of founded race concepts." *Philosophy of science*, 79(5), 701-713.
- Efstathiou, Sophia. 2016. "Is it possible to give scientific solutions to Grand Challenges? On the idea of grand challenges for life science research." *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences*, 56, 48-61.
- Efstathiou, Sophia, with Nydal, Rune, Laegreid, Astrid, and Kuiper, Martin. 2019. "Scientific knowledge in the age of computation: Explicated, computable and manageable?" *Theoria. Revista de Teoría, Historia y Fundamentos de la Ciencia*, 34(2), 213-236.
- Sexton, Alexandra. (2016). Alternative proteins and the (non) stuff of "meat". *Gastronomica*, 16(3), 66-78.

Constructing demand: How contemporary food practices reproduce the demand for meat in Norway

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The demand for meat products doubled in Norway between the 1960s and the 2010s (Ueland et al. 2022), and meat has moved from the periphery to the centre of peoples' diets (see Weis 2013). This demand is not simply about changes in consumer preferences and diets, but closely connected to geographies and politics of land, agriculture, and industrialisation in Norway. Today, demand for meat appears stubborn and resilient amid much talk about meat reduction. Indeed, after a slight decrease since 2014, meat consumption reached the highest point ever recorded in 2021 (Animalia, 2022). This paper aims to understand how demand for meat is constructed and reproduced through contemporary Norwegian food provisioning and eating practices. The analysis is based on a wide range of quantitative and qualitative data materials, including interviews with consumers in urban and rural areas of Norway, short interviews with consumers in urban parks, and a nationally representative consumer survey. The paper makes use of two theoretical perspectives: First, how consumption is defined by 'systems of provision' (Fine, 2002; Bayliss and Fine, 2020). This implies seeing supply and demand as interrelated, i.e., studying the ways in which supply both responds to and 'breeds' demand (Rinkinen et al. 2020). Second, we understand the consumption of foodstuff as embedded in and occurring as part of normatively structured social practices. This approach highlights the intricate and co-constitutive relationship between socio-material arrangements (e.g., supplying of food) and human action (e.g., domestic eating), acknowledging how (meat-intense) standards of eating are produced and reproduced in a continuous interplay between different actors/institutions (political bodies, agriculture, food producers, supermarkets, restaurants/cafeterias, households etc.), across urban and rural settings. Empirically, we study how consumers in different Norwegian contexts understand, explain and justify the role of meat across different interrelated food practices. In doing so, we show how demand is continuously constructed and reinforced through the ways in which consumers plan, shop, eat and waste food, and how this in turn is co-shaped by the provisioning strategies of different market actors.

References:

Animalia (2022). Kjøttets tilstand 2022. 228470-kt22-hele-korr12-dsc.pdf (animalia.no)

Bayliss, K., & Fine, B. (2020). A Guide to the Systems of Provision Approach. Springer International Publishing.

Fine, B. (2002). The world of consumption: the material and cultural revisited. London: Routledge.

Rinkinen, J., Shove, E., & Marsden, G. (2020). Conceptualising demand: A distinctive approach to consumption and practice. Routledge.

Ueland, Ø., Rødbotten, R., & Varela, P. (2022). Meat consumption and consumer attitudes – A Norwegian perspective. *Meat Science*, 192, 108920.

<https://doi.org/10.1016/j.meatsci.2022.108920>

Weis, T. (2013). *The ecological hoofprint: The global burden of industrial livestock*. Bloomsbury Publishing.

Re-configuring institutionalized food practices towards meat reduction: 'Outdoor grilling' and the 'Friday taco' in Norway

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It is now widely acknowledged that current meat consumption patterns in affluent countries are unsustainable and that the climate and nature crises call for less meat-intensive diets.

Recognizing this, an increasing number of consumers self-identify as flexitarians or reducetarians, choosing to eat less meat on some occasions but not others. Previous research has uncovered a wide range of social and material obstacles to successful meat reduction. With this in mind, lowering the environmental footprint of meat-heavy meals that are extensively and frequently consumed could be an effective strategy for achieving more sustainable food patterns. With this premise as a starting point, this paper investigates two meat-intensive food practices as sites for transforming 'institutionalized meals' towards meat reduction.

We explore and compare the narratives of two particular food practices as they appear across in-depth interviews with households in Norway (N=70) about the role of food in everyday life and the prospect of reducing and substituting meat. The first is the 'Norwegian taco' – a Tex-Mex style meal usually including tortillas, meat, and vegetables; often in part prefabricated and routinely eaten during weekends across Norway. This meal, which might be thought of as a food institution and a surprisingly central aspect of contemporary food culture in Norway, has become incredibly popular since its introduction with the influx of international food products on the market in the 1980s and 1990s. The second is the typical 'outdoors grilling' practice, commonly performed on terraces and balconies and disposable grills across Norway during spring and summer, or around bonfires all year around. While this practice is more temporally and spatially flexible than the Friday taco meal, it is still highly routinized and based on a market segment of meat-heavy convenience foods.

Across the sample, these two food practices were often brought up by participants as contested sites for meat reduction. An analysis of such reflections demonstrates that these food practices represent more than a meal. In both cases, the food experiences extend much further than the products and ingredients in use: they are intrinsically tied to specific rituals, traditions, routines, temporalities, conventions and social interactions – as well as the affective states related to all of these. The findings both illustrate the complexity involved in re-configuring such 'institutionalized' meals and hint at opportunities for accomplishing change. The paper argues that successful meat reduction cannot focus solely on individuals' attitudes or the availability of plant-based alternatives but must also challenge the meaning of meat in deeply rooted and institutionalized food conventions and traditions.

What does it mean to replace meat? Cross-cultural meat practices and their implications for a protein transition

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Conventional sources of animal-based protein, such as meat and milk, are damaging planetary and public health. In this context, Western food system actors are calling for a 'protein transition' from animal-based to plant-based protein. A significant area of societal and scientific interest in this direction is the development of meat analogues. These plant-based products – designed to closely simulate conventional meat-based equivalents – are intended to easily replace meat, fitting seamlessly into people's established menus and consumption patterns in place of animal-based foods. Indeed, among certain (wealthy, educated) people in certain (urban, Western) places, meat analogues have been relatively successful. But will this mode of meat replacement work elsewhere, on a larger scale?

This paper argues that replacing 'meat' is not simply a question of substituting one thing for another. Rather, it entails a wholesale reconfiguration of a constellation of food provisioning and consumption practices, as well as their attendant sociotechnical architectures. Consequently, culturally-specific approaches to achieving a 'protein transition' cannot be transposed across contexts.

The paper is based on an exploration of meat-related food practices in Western Europe and Southeast Asia, drawing on qualitative fieldwork and existing research literatures. With consumption as a broad focus, we first elaborate what constitutes 'meat' in the West and how this has arisen. We explain how Western 'meat replacement' is inextricably connected to the thing it replaces, reflecting how meat is 'uncoupled' from its relations of production. Contrasting this with Asia, where meat is 'coupled' to its constitutive practices, we highlight the incompatibility of meat analogues in contexts where meat is a 'lively' commodity. Consequently, we argue that the use of meat analogues to achieve a protein transition is limited in its cultural-geographic applicability. Further, we suggest that debates on food system transformation might profitably conceptualise 'meat' not as a product, but as a practice.

Can edible insects become the new meat? Exploring consumers' experimentation with insect foods in everyday life

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Edible insects are often proposed as one of several 'alternative proteins' with potential to substitute conventional meat in the future. Because insects are protein-rich, nutritious, and seem to require less resources (land, water, and energy) than regular livestock animals, some believe insect farming could be a 'silver bullet' to the meat problem (Halloran et al. 2016). Insects are regularly eaten in many parts of the world, but insect foods are branded as a 'novel' or 'future' food in the so-called Global North. With a fast-growing market, some have predicted that edible insects could soon become a 'foodie craze' among consumers in Europe (Megido et al. 2018). The envisioned 'successes' of emerging foods like edible insects is often hypothesized via quantitative measures of consumers' acceptance, or sensorial interventions in controlled research settings. While extensive research has been conducted to explore consumers' attitudes towards, and willingness to eat, different kinds of insects, little is known about how consumers engage with insect foods in their everyday lives outside of the artificial settings of the laboratory (cf. House 2019). Tasting sessions can be a form of 'visceral witnessing' (Sexton et al. 2022) in the encounter with new foods, but they obfuscate the contextual embeddedness of food in daily life.

Recognizing the limited academic attention to the mundane and quotidian aspects of dietary transition towards alternative proteins, this paper analyses data from a study that recruited ten households in Norway to experiment with market-available edible insect products for two weeks and record their experience through logging, photography, and personal reflections. In-depth interviews were conducted before and after the experimentation period. This food intervention allowed studying consumers' experiences and 'visceral encounters' with insect foods in the context of their everyday lives in a place where insects are relatively uncommon as ingredients. Drawing on social practice theories of eating and visceral food geographies, the study explores how the 'edibility' and 'desirability' of insects were negotiated by consumers and the strategies used to implement unfamiliar foods into new and established food practices. While questioning the extent to which edible insects can substitute meat in the food practices of consumers in Norway, I suggest that familiarization with new foodstuffs can provide avenues for re-thinking established food norms and patterns towards more sustainable food futures.

References

- Halloran, Afton, Nanna Roos, Jørgen Eilenberg, Alessandro Cerutti, og Sander Bruun. 2016. «Life Cycle Assessment of Edible Insects for Food Protein: A Review». *Agronomy for Sustainable Development* 36 (4): 57. <https://doi.org/10.1007/s13593-016-0392-8>.
- House, J. (2019) 'Insects are not "the new sushi": theories of practice and the acceptance of novel foods', *Social & Cultural Geography*, 20(9), pp. 1285–1306. Available at: <https://doi.org/10.1080/14649365.2018.1440320>.
- Megido, R. C., E. Haubruge, og F. Francis. 2018. «Insects, The Next European Foodie Craze?» https://doi.org/10.1007/978-3-319-74011-9_21.
- Sexton, A.E., Garnett, T. and Lorimer, J. (2019) 'Framing the future of food: The contested promises of alternative proteins', *Environment and Planning E: Nature and Space*, 2(1), pp. 47–72. Available at: <https://doi.org/10.1177/2514848619827009>.

Sexton, A.E., Garnett, T. and Lorimer, J. (2022) 'Vegan food geographies and the rise of Big Veganism', *Progress in Human Geography*, p. 03091325211051021. Available at: <https://doi.org/10.1177/03091325211051021>.

A07: Sustainability Transition: Towards a social-psychological understanding of human motivations within the production-consumption system (1/3)

Session Chair: Soumyajit Bhar

Room: B: Atlas, R: Atlas 2 (max. 80)

Triggering inclusive transitions through cooperatives

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This study investigates the role of identity in fostering or hindering the scale-up of renewable energy supply and related activity by energy cooperatives. Most studies investigating the role of group identity per se focus on the benefits of group identities, such as fostering motivation and perceived efficiency for sustainable actions through group membership. Yet, this perspective tends to underestimate the negative effects of social identity for inclusive energy transitions. For example, energy communities are, so far, often made-up of older men with higher education levels and a good income. This creates a particular group identity that is likely to attract people with similar characteristics - while at the same time making it less attractive to join for people with different characteristics, e.g. a different gender or education level.

With this in mind, this study examines the case of a federation of energy cooperatives with more than 70 energy cooperatives in the North of Germany. In an inter- and transdisciplinary project, we analyze the different interests and identities of the energy cooperatives, the implications for inclusivity and exclusivity, and the consequences in terms of the propensity for different types of citizen to join particular energy cooperatives. A specific focus will be on the early phase of identity formation of the different cooperatives. The goal is to draw inferences that encompass (i) the level of the individual (e.g. individual motivations and barriers to join energy cooperatives), (ii) the group level of the energy cooperative (e.g. an analysis of the communication strategy), (iii) the organisational level of the energy cooperative (e.g. on providing workshops for new energy cooperatives); and (iv) the political level (e.g. potential need for more support to the voluntary engagement of citizens).

Through the above, we aim to connect different process levels in our analysis and inferences, such as the effect of policy support in terms of lowering individual barriers for joining an energy cooperatives e.g. regarding time and financial investment (individual sacrifices). In this way, we aim for a theoretical and practical balance between supporting but not over-emphasizing individual agency in energy transitions. We also reflect on the interplay of identity-related norm change and norm institutionalisation, and policy and technological change, i.e. the interplay of structures that are internal and external to individuals. This has implications for policy questions such as how presumption may be normalised (further upscaled) beyond energy communities, what we may learn from the experiences of energy communities in this respect, and how identity plays a role in this, particularly in terms of the roles that social and individual norms play in shaping identity.

Knowing Sufficiency

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The “sufficiency turn” in sustainability science has arrived not a day too late. While the notion of sufficiency has long existed in the environmental literature, knowing sufficiency in operational, procedural terms is yet to be resolved. How much is enough? And, how do we ask and answer that question in diverse developmental contexts? In the Anthropocene, this question needs to be asked of individuals but also of collectives. The law of diminishing marginal utility points an individual to sufficiency (satiation) as one meaning of the word used here. However individuals and collectives inhabit a habitus that mediates between structure and behaviour. In the world beyond microeconomics textbooks, individual choice alone, based on diminishing marginal utility and mediated by the market, fails the challenge of knowing sufficiency. Not only do standard economics tools fail to enable sufficiency at the level of individual choice, they are silent about objective social conditions (i.e. production-consumption systems and ultimately the global economy geared toward the most efficient possibilities for accumulation) that shape consumption. The socio-ecologically educated macroeconomist is limited to pleading that society should make the morally correct choice of turning off growth. But s/he fails to see insatiability in some places and exploitation and injustice in others as objective requirements for the accumulation of capital. Our question of knowing sufficiency then turns on collective capabilities to calibrate the use and allocation of, and the limits to the accumulation of capital. The latter without accountability to justice, engenders a habitus of production and productivity *ad infinitum*, within which only the odd ascetic finds sufficiency. It's hardly a prescription for knowing sufficiency, collectively. Knowing sufficiency, through justice, turns on the collective capabilities of democratic governance to interrogate normative preferences, priorities as well as the objective conditions of accumulation. This paper examines the governance of urban mobility in a metropolitan city and the governance of a rural solar micro-grid system and asks if they are equipped to know sufficiency?

Insights into public-private conundrum to realize double dividend at the intersection of social-psychology and political economy

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Both sustainability transition and sustainable consumption literature adopt a theory of change that centers around the individual agency. This individual agency is conceptualized to take the route of voluntary simplicity for transforming the growth-centered neoliberal political economy. This eventually offers individuals a higher sense of wellbeing. The voluntary simplicity premise is conceptually dependent on the concept of double dividend, which calls for decoupling material need-satisfiers from wellbeing and reorienting them to non-material need-satisfiers through community-based living. As this panel presents, the concept of double dividend also provides a tangible direction for converting the private-public conundrum to a private-private relationship. However, we need to ask how to realize this double dividend both in the Global North and in response to the call of leapfrogging in the Global South.

To that end, I present a critical take on this call for voluntary simplicity dependent on the concept of the double dividend, first by categorically analysing the fundamental motivations behind recent proposals of ultra-high-net-worth individuals to favor technological salvation pathways over adopting voluntary simplicity. To shed light on whether voluntary simplicity is likely to be the norm or some fringe exceptions, the structure of motivations will be examined through the lens of two fundamental complexities that are an integral part of today's neoliberal political economy. Firstly, due to the globalized supply chain, the scale of the public has expanded from local/regional to global. Now, because of the increased distancing between production and consumption, individuals cannot experience or witness the impact of their consumption choices. Secondly, because of this distancing, the share of private harm or benefit in the public harm or good has reduced significantly. The private share of a public good is now minuscule. So, this concretizes the private-public conundrum further and eventually hinders the realization of double dividend.

Second, the neoliberal political economy has struck a chord with fundamental human motivation by allowing individuals to realize a sense of individuality by offering materially-enabled exit options necessary for higher wellbeing. Even though the concept of a double dividend emphasizes the need to adopt community-oriented living to unpack non-material need-satisfiers, community-oriented living might not provide individuals the option to exit out of conflict situations and therefore, might fail to offer a sustained sense of wellbeing.

On the basis of these two critical expositions, I analyse how far the call for leapfrogging to realize this double dividend in the Global South seems tenable. The question is how far the role of individuals' subjective experience of pathways to material freedom allows them to realize that those pathways do not lead to sustained wellbeing and therefore motivates them to make an informed choice of voluntary simplicity towards realizing double dividend. The presentation ends with posing two questions: a) is there adequate moral motivation for individuals to choose voluntary simplicity except the individuality offered by this materially-enabled informed choice; b) can voluntary simplicity lead to sustained wellbeing when the public-private conundrum has been reinforced within a neoliberal political economy?

At a Distance, All Is Well: The Intertwining Relationship Between System Justification, Psychological Distance, and Environmental Concern

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In the face of increasingly challenging environmental developments, achieving broad support for pro-environmental policies and business practices has become more important than ever. It is therefore particularly important to address people resisting the social change needed to tackle environmental problems.

By linking system justification and construal level theory, we propose that the tendency to justify the overarching social structure (system justification) increases the psychological distance (the degree to which people feel removed) of environmental problems. As a result, environmental problems are not perceived as urgent or are simply downplayed. Based on our framework, there are thus two starting points to convince people who resist the social change needed to tackle environmental problems. First, one could try to put the overarching social structure in question, which might in turn decrease the psychological distance of environmental problems and therefore increase the perceived urgency. System justification theory, however, posits that threats to the system lead to exactly the opposite reaction, i.e., an increase in system justification, finally strengthening resistance to social change. Second, one could try to decrease the psychological distance in such a way, that it is not perceived as a threat to the social system. This should finally result in an increased perceived urgency of environmental problems, also for people who generally resist the social change needed to tackle environmental problems. The first part of our theorizing was tested with a correlational study (Study 1) with N = 196 participants from the US. As expected, system justification was positively correlated with psychological distance, whereas psychological distance was negatively correlated with measures of environmental concern (both on a global and general level). Subsequent bootstrap-tests indicated a significant indirect effect via psychological distance, thus corroborating our theorizing.

The second part of our theorizing was tested in an experimental study (Study 2) with N = 130 participants from the US, manipulating system justification by having participants read a newspaper article questioning the system (system threat condition) or affirming the system. The pattern of results revealed a moderated mediation such that for people low in trait system justification (as measured before the experiment), system threat decreased psychological distance, which in turn increased global environmental concern. No such effect, however, was observed for participants high in trait system justification, thus indicating that for them threats to the system had no effect on psychological distance and global environmental concern.

A further study that is currently conducted aims at decreasing psychological distance in such a way, that it is not perceived as a threat to the social system. This should increase perceived urgency of environmental problems, even for people high in trait system justification.

On a theoretical level, by linking system justification and construal level theory, our research facilitates a more nuanced view on the question of why for some people different efforts aiming at questioning the status run into the void. On a practical level, it bears implications for the

framing of environmental problems and a targeted approach of audiences through ideological market segmentation.

Social relations and reduced consumption – obstacles and possibilities

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Social relations play a crucial role when people aim to adopt a more sustainable lifestyle. Our relations are entrenched with norms, rituals, and status orientation surrounding consumption that often act as obstacles if one tries to make sustainable choices. But social networks can also, if supportive, facilitate a transition to alternative practices and lifestyles. This spurs the question of what types of communities and relational support is needed for such facilitation, and further, how can people organize their social lives in ways that enable more sustainable lifestyle choices? One such alternative sustainable lifestyle choice is to consume less. Voluntary reductions of consumption have mostly been studied in relation to voluntary simplifiers and other committed frontrunners. This ongoing study aims to contribute with knowledge about obstacles and possibilities experienced by more mainstream consumers, namely individuals who are planning, or have recently started, to reduce their consumption. Through qualitative interviews and follow-up memory notes from interviewees about their experiences, the study follows 20-25 individuals in their attempts to lower their consumption. 10 individuals are interviewed twice, with 9-12 months in between the interviews. Some interviews are also done with more committed downshifters, who are expected to already have overcome several obstacles in their processes. The preliminary results of the study point to that most interviewees do not experience any serious social difficulties in the initiating, often “softer” phase of consumption reduction. The difficulties enter when their ambitions to reduce consumption target social activities such as dining out, gift-giving or travelling with family and friends. The study offers insights into the various nature of difficulties experienced in relation to others when aiming to reduce one’s consumption and shows how these difficulties may change over time. The results further highlight the potential that is to be found in supportive social networks. We have yet to decide on a theoretical perspective but are considering looking at the journey toward reduced consumption as part of a transformative learning process, and, consequently, to use the framework of transformative learning as a theoretical lens. To surmount social-relational obstacles is an essential part of individual transitions to more sustainable lifestyles and learning more about how these obstacles may be overcome offers opportunities to facilitate for reduced consumption at a larger scale.

A08: Living Labs: Reflecting on the structuration of transformation; addressing impacts, replicability and scalability (1/4)

Session Chair: Julia Backhaus, Julien Forbat
Room: B: Omnia, R: Auditorium (max. 108)

Understanding key factors for motivation and engagement in living labs

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Living labs are key to achieving the sustainability transition. Reason for this is that through their transdisciplinary process they engage and integrate the needs of different local stakeholders to develop efficiency or sufficiency solutions for the local context. However, for the uptake of solutions to breach the immediate living lab context, we need to understand relevant factors for upscaling. There are few empirical and comparative evaluations of the factors relevant for upscaling living lab processes and findings. While most research on sustainability transition processes emphasizes the crucial role of users, citizens and other stakeholders, there is still a gap in the understanding of driving factors of motivation and longer-term engagement of these stakeholders in living lab processes and in driving forward change. Of particular interest are shared visions and goals, the 'commitment' of members, structural factors such as resources and organizational capacities (e.g. funding and leadership), as well as local connectivity. In this research we investigate factors of motivation and engagement in transdisciplinary co-creation processes in living lab contexts. Specifically, we utilize a mixed method approach, analysing interview, focus group and survey data of transdisciplinary co-creation processes within the living lab Wettstein. Wettstein is a neighbourhood in the city of Basel (Switzerland) in which the neighbourhood association 'Wettstein 21' founded a living lab 'Quartierlabor Wettstein' to co-create ways to develop the district into a more climate neutral and sustainable district (e.g. develop superblocks). In this talk, we present data regarding motivation and engagement in the co-creation processes to understand these key factors relevant for upscaling living labs.

Squaring the circle of closing the loop: The synchronization of Living Labs along the material cycle of bioplastics

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After 100 years, plastic, the light and robust “magic material” applicable in nearly all areas of life has revealed its accompanying dark sides: environmental pollution and multiple threats to human and animal health. Next to reduce-reuse-recycle initiatives in research and industry targeting conventional plastics, bioplastics have emerged as a viable alternative. However, due to their superiority to fossil-based plastics in terms of a number of sustainability aspects, bioplastics tend to be overlooked in initiatives aimed at closing material loops.

The Aachen Bioplastics Cycle Living Labs Incubator (ABC-LLI), a new, exploratory research initiative at RWTH Aachen University seeks to combine and align the experience, expertise and efforts of local and regional stakeholders in a network of synchronized Living Labs to study opportunities for circular material flows of bioplastics. In this feasibility study, more than 15 research groups at and around Aachen University across the natural, social and engineering sciences collectively and in collaboration with external stakeholders aim to identify the most sensible approach to setting up a strategic network of multiple Living Labs along the material cycle of bioplastics. To this end, insights from interviews with scientific experts, stakeholder workshops and public engagement pilot studies with different target groups inform the emerging plan of action.

Since the SCORAI-ERSCP-WUR conference marks the halftime point of the ABC-LLI research initiative, the project team is keen to present preliminary findings for feedback and discussion. Inspired by Donella Meadow’s “Places to Intervene in a System” (1999), a typology of experiments in sustainability science by Caniglia et al. (2017) and a typology of more than 30 Living Lab initiatives at and around RWTH Aachen University (Backhaus et al. 2022), we seek to identify the best strategies towards creating several, synchronized Living Labs to square the circle of closing the loop. Of particular concern in this regard are challenges pertaining to the persistence of unsustainable production-consumption systems (Mathai et al. 2021) and whether networked Living Labs may function as catalysers to overcome some of these persistencies.

References

- Backhaus, J., John, S., Böschen, S., de la Varga, A. & Gramelsberger, G. (2022). Reallabore um die RWTH Aachen: Rückblicke, Einblicke, Lichtblicke, pnd - planung neu denken, 1/2022 Transformatives Forschen trifft Stadtentwicklung. doi: 10.18154/RWTH-2022-05170
- Caniglia, G., Schäpke, N., Lang, D. J., Abson, D. J., Luederitz, C., Wiek, A., Laubichler, M. D., Gralla, F. & von Wehrden, H. (2017). Experiment and evidence in sustainability science: A typology. *Journal of Cleaner Production*. 169, pp. 39-47, doi: 10.1016/j.jclepro.2017.05.164
- Mathai, M. V., Isenhour, C., Stevis, D., Vergragt, P., Bengtsson, M., Lorek, S., Mortensen, L. F., Coscieme, L., Scott, D., Waheed, A. & Alfredsson, E. (2021). The Political Economy of

(Un)Sustainable Production and Consumption: A Multidisciplinary Synthesis for Research and Action. Resources, Conservation and Recycling, 167, 105265, doi:

10.1016/j.resconrec.2020.105265

Meadows, D. H. (1999). Leverage Points: Places to Intervene in a System. The sustainability Institute.

From Theory to Practice: integration of NBS in urban landscape governance through Living Labs. Evidence from Europe and Latin America.

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As Nature-based solutions (NbS) emerge as providers of co-benefits for the improvement of urban environments, they call for an alternative approach to the consumption and production of urban landscapes. NbS multiforms, multifunctionality and multi-benefits, entail multidisciplinary, multi-actor, and collaborative co-production and co-management. They challenge the conventional socio-technical urban development regimes in place and cause them to strive to be integrated within the mainstream landscape planning and design culture. Amid the pathways to integrate NBS in urban governance, towards more sustainable and resilient landscapes, Living Labs (LLs) are being increasingly promoted by research and development institutions. They are regarded as potential instruments for NBS design and implementation in cities and it is being trialed across the world. However, the extent to which LLs can foster NBS integration is yet unclear. There is a predominant ambiguity regarding to what capacity can LLs contribute to transformative change in and beyond its border. LLs are considered a new tool towards landscape development being regarded as grounds for knowledge creation and awareness raising while also often regarded as small, punctual and resource-consuming projects (time, personnel and financial resources) that can act as isolated events fading away without provoking any significant effect. There is an overall gap regarding how this typology of projects can promote wider impacts, in particular in the environmental and sustainability fields. This study dives into this gap. It asks how landscape projects following a Living Lab approach act as a catalyst for the uptake of NBS in urban landscape governance. Through the case studies of Bogota, Buenos Aires, Santiago and Turin, part of the H2020 project CONEXUS, it investigates LLs impact for transformative change in Europe, where the approach of LLs are already widely in course, and in Latin America, where the practice is at its beginning. This research aims to (i) understand how LLs are being translated to the landscape and NBS field in practice; (ii) the effects that LLs have on the uptake of NBS in local urban landscape governance in EU and LA in the short term; (iii) comprehend the opportunities and shortcomings that LLs present towards the uptake of NBS for transformative change and (iv) assess if LLs are considered successful tools for NBS integration. The research follows a before and after multiple case study design, to gather insights before and after the LLs intervention. The methods used include a literature analysis to assess the state of the art of NBS and LLs, an in-depth analysis of official LLs documents to take stock of LLs structure, activities and reported characteristics; and a collection of primary data through qualitative interviews to gather the perspective and experiences of LLs direct and indirect participants before and after the project. Findings from this study can guide future research and development actions regarding LLs support and implementation towards the development and mainstreaming of environmental innovations such as NBS. It further sheds light on LLs and NBS experiences in Latin America contributing to expanding the knowledge of those practices in this region.

Three years later... What are the habits and routines of our ENERGISE-households?

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Presenter: Veronique Vasseur, veronique.vasseur@maastrichtuniversity.nl (in person)

Households around the world are experiencing dramatic changes in light of the COVID-19 pandemic and the drastic increase of energy prices. Habits and routines are being disrupted, reinterpreted, reorganized and renegotiated, albeit under constraints and in most cases involuntarily. Due to higher impacts on lower income households, relevant social justice issues are implicated in these changes. This is also the case in The Netherlands, in the words of Netherlands Minister for Climate and Energy Policy Rob Jetten: "Energy saving hasn't received the attention it deserves in recent years. We are changing that now. It's wise to save energy for several reasons: it's good for your wallet, good for the climate and it helps us to become less dependent on gas from Russia." (Rijksoverheid.nl).

Cultural change is a key ingredient in successful energy transitions (O'Rourke and Lollo 2015). Households energy consumption is a function of who we are, where we come from, and the socio-cultural and material contexts in which we live. Societal norms and routines with regard to work, education, family life, consumption and recreation greatly determine our patterns of energy use as well as our ability and willingness to change those patterns (ENERGISE 2016). In order to analyse this household energy consumption, including their societal norms and routines, the use of Living Lab approaches demonstrated that reductions are possible when routinized practices are disrupted through experimentation (Sahakian et al., 2021).

A Living Lab approach is used to test two energy reduction challenges to two groups of households, an individual-focused and a community-oriented approach, to reduce indoor temperature to a maximum of 18°C ('heating challenge') and half the number of weekly laundry cycles relative to a baseline ('laundry challenge'). Their implementation took place in late 2018, with the study continuing in 2019 with a follow-up survey three months after the end of the challenge period. Quantitative and qualitative data were collected before, during, and after the challenges. We analysed how 'doing laundry' and 'keeping warm', as very different types of practices, responded to the change initiative. Average changes in reported temperatures indicated that reductions are possible, without an emphasis on individuals or technologies as central to change.

Is this still the case, three years after? And can we determine if and to what extent these behaviors have been conditioned by a dual shock from the coronavirus pandemic (COVID-19) and the rise of gas prices? In order to answer these questions, the same households are analysed with a follow-up survey administered three years after the end of the challenges. This introduced an element of comparison over time in which participants were able to reflect on changes in their everyday lives, from before the challenges to three years after. Our findings show that reductions are possible when routinized practices are disrupted through experimentation. The longitudinal study showed that the meanings tied up with being comfortable indoors has changed due to the experiment and that the participants of the community-oriented living lab have learned more about how to connect and reach out to learn and adapt collaboratively.

References

-ENERGISE (2016) "Project Description" Retrieved April 26, 2022 from <http://www.energiseproject.eu/about-ENERGISE>

-O'Rourke, D. and Lollo, N. (2015) "Transforming Consumption: From Decoupling, to Behavior Change, to System Changes for Sustainable Consumption". Annual Review of Environment and Resources, 40, p.233-259

-Rijksoverheid.nl (2022) "Kabinet start landelijke Energiebesparingscampagne en komt met Nationaal Isolatieprogramma om 2,5 miljoen woningen snel te isoleren" Retrieved April 26, 2022 from <https://www.rijksoverheid.nl/actueel/nieuws/2022/04/02/kabinet-start-landelijke-energiebesparingscampagne-en-komt-met-nationaal-isolatieprogramma-om-2.5-miljoen-woningen-snel-te-isoleren>

-Sahakian, M., H Rau, E Grealis, L Godin, G Wallenborn, J Backhaus, F Friis, A.T. Genus, G. Goggins, E. Heaslip, E. Heiskanen, M. Iskandarova, C.L. Jensen, S. Laakso, A. Musch, C. Scholl, E. Vadovics, K. Vadovics, V. Vasseur, F. Fahy (2021) "Challenging social norms to recraft practices: A Living Lab approach to reducing household energy use in eight European countries." Energy Research & Social Science 72: 101881

Exploring the potential of transformative spaces in sustainability transitions

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To address complex societal challenges, such as climate change, biodiversity loss and growing inequality, we need sustainability transitions that include transformative changes (i.e. fundamental, large-scale and structural changes) in several societal subsystems (Grin et al., 2010). Since these transitions are systemic and complex in nature, they often cannot be addressed by single actors alone. Tackling these challenges can therefore be seen as multi-actor processes, necessitating cooperation of different actors across sectors, in order to determine common goals, values and courses of action (Frantzeskaki & Rok, 2018). Moreover, it is increasingly argued that these processes require the co-production of knowledge between several actors (Patel, 2022).

This multi-actor cooperation for sustainability transitions is a complex process that is already taking place in practice. Different types of actors, including governmental, business, civil society and academic actors, are meeting each other in spaces, such as living labs, professional conferences, platforms, boards and studios, that can cover several topics relating to different sectors, including mobility, energy, agriculture or industry. Within these spaces, actors come together to discuss, exchange and make decisions pertaining to sustainability transitions. However, there is no systematic analysis yet of how these spaces are set up and developed in practice, or on how they can be conceptualised, compared and researched. Moreover, there is no comprehensive research on how the transformative potential, i.e. the capacity of these spaces to contribute to transformative change towards sustainability, can be assessed.

We therefore propose the term transformative spaces to refer to spaces where different types of actors are coming together with the intention to collaboratively contribute to transformative changes towards sustainability. The goal of this paper is to provide a literature review on the concepts of transformative spaces and transformative potential. In doing so, this paper investigates how we can conceptualise, analyse and evaluate the transformative potential of these spaces. Thereby this paper aims to answer the following research question:

How have the concepts of transformative spaces and transformative potential been analysed and conceptualised in the literature so far, and what can we learn from that for conceptualising the transformative potential of transformative spaces for sustainability transitions?

To answer this question, the first section of this paper provides an extensive review of how transformative spaces have been conceptualised so far. In this review, we include scholarly debates on transition studies, innovation studies, management and organisation and governance, where concepts such as sustainability-oriented labs (McCrorry et al., 2022), mission arenas (Wesseling & Meijerhof, 2021), science-practice dialogues (Ernst et al., 2017) or spaces for learning (Beyers & Leventon, 2021) have been used to study transformative spaces. The second section reviews how the notion of transformative potential has been conceptualised and analysed in the literature so far, building on research on sustainability transitions and transformations (Feola, 2015; Köhler et al., 2019). Finally, the last section of this paper

synthesizes the findings and draws lessons on how we can connect the two concepts in order to further conceptualise the transformative potential of transformative spaces in sustainability transitions research.

References

- Beyers, F., & Leventon, J. (2021). Learning spaces in multi-stakeholder initiatives: The German Partnership for Sustainable Textiles as a platform for dialogue and learning? *Earth System Governance*, 9, 100113. <https://doi.org/10.1016/j.esg.2021.100113>
- Ernst, A., Fischer-Hotzel, A., & Schumann, D. (2017). Transforming knowledge for sustainability: Insights from an inclusive science-practice dialogue on low-carbon society in Germany. *Energy Research & Social Science*, 29, 23–35. <https://doi.org/10.1016/j.erss.2017.04.006>
- Feola, G. (2015). Societal transformation in response to global environmental change: A review of emerging concepts. *Ambio*, 44(5), 376–390. <https://doi.org/10.1007/s13280-014-0582-z>
- Frantzeskaki, N., & Rok, A. (2018). Co-producing urban sustainability transitions knowledge with community, policy and science. *Environmental Innovation and Societal Transitions*, 29, 47–51.
- Grin, J., Rotmans, J., & Schot, J. (2010). *Transitions to sustainable development: New directions in the study of long term transformative change*. Routledge.
- Köhler, J., Geels, F. W., Kern, F., Markard, J., Onsongo, E., Wieczorek, A., Alkemade, F., Avelino, F., Bergek, A., Boons, F., Fünfschilling, L., Hess, D., Holtz, G., Hyysalo, S., Jenkins, K., Kivimaa, P., Martiskainen, M., McMeekin, A., Mühlemeier, M. S., ... Wells, P. (2019). An agenda for sustainability transitions research: State of the art and future directions. *Environmental Innovation and Societal Transitions*, 31, 1–32. <https://doi.org/10.1016/j.eist.2019.01.004>
- McCorry, G., Holmén, J., Schöpke, N., & Holmberg, J. (2022). Sustainability-oriented labs in transitions: An empirically grounded typology. *Environmental Innovation and Societal Transitions*, 43, 99–117. <https://doi.org/10.1016/j.eist.2022.03.004>
- Patel, Z. (2022). The potential and pitfalls of co-producing urban knowledge: Rethinking spaces of engagement. *Methodological Innovations*, 15(3), 374–386.
- Wesseling, J., & Meijerhof, N. (2021). Developing and applying the Mission-oriented Innovation Systems (MIS) approach [Preprint]. SocArXiv. <https://doi.org/10.31235/osf.io/xwg4e>

A09: Edurruption: The disruptive potential of education for transforming consumerism (1/3)

Session Chair: Daniel Fischer

Room: B: Omnia, R: Momentum 1 (max. 30)

Wondering, wandering, caring and daring -- key processes for transformative learning

Victoria W. Thoresen, Inland Norway University of Applied Sciences, Hamar, Norway

Presenter: Victoria W. Thoresen (in person)

In many educational situations, consumer education is driven either by a fear of an apocalyptic future or a focus on material well-being that overshadows other aspects of personal and social development. New learning processes are desperately needed which enable individuals to recognize injustice, face their fears, empathize with others, cope with ambiguity and collaborate on identifying and implementing constructive, immediate and long-term solutions to unsustainable consumption. Numerous attempts have been made to describe such learning processes, but be they, for example, “learning as transformation” (Mezirow, 2000) or “collaborative and disruptive learning” (Wals & Lenglet, 2016) or “transformative, transgressive learning” (Lotz-Sisitka et al., 2015), the emphasis has been primarily on the development of cognitive awareness. Research into changing habits (Jackson, 2005; Duhigg 2012) underlines the important role of emotions and incentives, support groups and rewards.

By concentrating on “caring and daring”, which are emotionally driven processes that are often downplayed when discussing transformative learning, education could have the potential of becoming genuinely disruptive, closing the value-action gap and promoting behaviour that significantly alters the manner in which people choose to live.

Focusing on “caring” would involve in-depth reflection over the purpose of life both for the individual and for society at large. Caring means giving attention to, listening wholeheartedly and nonjudgmentally, and not being indifferent. Caring transcends “being nice” or “having solidarity with” nature or other people. It contains elements of passion and concern. Learning to be caring requires strategies for promoting sympathy, empathy, compassion and excellence. These qualities are motivating factors for active engagement in improving one’s own life situation as well as that of the world.

Cultivating “daring” would also be dependent upon new approaches, ones that involve building self-confidence as well as the ability to make mistakes and try again. Daring in this context would not be a feature of aggressive or life-threatening behaviour, but rather include the capacity to listen to unconventional voices, consider new evidence and move down paths others have not gone before. A daring person would have to learn discernment. He or she would have to develop courage, fortitude and resilience.

This presentation will reflect on what is meant by learning characterized by wondering, wandering, caring and daring. It will consider the environment needed to facilitate this kind of learning and briefly look at a few examples of radical changes in consumption on both a personal as well as systemic level that might well have had their roots in this kind of disruptive education.

Beyond Teaching the Consumer: A Needs-based Conception of “Education for Sustainable Consumption”

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(Anthony) Shun Fung Chiu, De La Salle University, Manila, The Philippines
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The paper presents an educational theoretical reflection and intervention on the challenges of contributing through education and learning to the transformation towards sustainable and just consumption and production systems. The starting point is a problematization of dominant approaches in consumer education to meet the socio-ecological challenges through incremental curricular integration, which mainly focus on responsabilizing learners in their role as consumers (e.g. consumer citizenship) and define solutions as system-immanent adaptations (e.g. qualification for green jobs) (Chachelin, Rose & Paisley, 2015). In response to this critique, this conceptual contribution explores how the critical potential of education for sustainable development can be used more strongly to expand the discourse space in which transformations of consumption and production systems are conceived and thereby support contemporary change processes more effectively.

The starting point of the argumentation is the sociological distinction between functions that educational systems fulfill (Biesta, 2015): schools introduce young people into an existing social and cultural order (socialization) and train them for concrete professional needs (qualification). In addition to this adaptation, however, they should also support learners in emancipating themselves, becoming independent and critically questioning the existing order (subjectification). This paper argues that education in the context of socio-ecological challenges should be conceived less as a response to unsustainability and much more as a driver of social change (transformation) (Lotz-Sisitka, 2015). To this end, the paper proposes a needs-based concept of “education for sustainable consumption” that no longer takes its starting point in the role of individual consumers, but problematizes current systems of consumption and production as a historical social variant for satisfying human needs (Fischer, King & Casanova, 2023). By taking human needs and social models for their satisfaction as the reference space for the pedagogical discussion of “sustainable consumption”, the structurally immanent narrowing to consumption and the consumer role can be overcome and discourse spaces can be opened to think about a safe and just satisfaction of needs as a goal of sustainable development both within and beyond consumption and production. The article shows on the basis of some case studies how a needs-based education for sustainable consumption can look like in practice and raises questions for further educational theorizing and experimentation.

Biesta, G. (2015). What is Education For? On Good Education, Teacher Judgement, and Educational Professionalism. *European Journal of Education*, 50(1), 75–87.

Chachelin, A., Rose, J., & Paisley, K. (2015). Disrupting neoliberal discourse in critical sustainability education: a qualitative analysis of intentional language framing. *Environmental Education Research*, 21(8), 1127–1142.

Fischer, D., King, J. A., & Casanova, C. R. (2023, forthcoming). I can’t get no satisfaction! Deliberating needs and satisfiers in sustainable consumption. In D. Fischer, M. Sahakian, J. King, J. Dyer, & G. Seyfang (Eds.), *Teaching and Learning Sustainable Consumption: A Guidebook*. Routledge.

Lotz-Sisitka, H., Wals, A. E. J., Kronlid, D., & McGarry, D. (2015). Transformative, transgressive social learning: Rethinking higher education pedagogy in times of systemic global dysfunction. *Current Opinion in Environmental Sustainability*, 16, 73–80.

Edurruption by “Arbeitslehre” (Work Studies)?

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Presenter: Ulf Schrader (in person)

“Arbeitslehre” has been implemented in many German schools as an innovative subject in the early 1970s. Although we use “Work studies” for international communication, there is no proper translation for this school subject, which focusses on a broad understanding of work, considering both paid and unpaid work (including consumption). By integrating economic education, technical education, and consumer education especially in practical projects, the subject should increase both, vocational choice competence and everyday life skills. While ecological and social issues have been reflected from the beginning, today the subject claims to contribute to education for sustainable development (ESD).

After serving as Arbeitslehre professor for 15 years now (without knowing the subject when I first read the job advertisement), I am more than ever convinced, that the subject indeed has the potential to be a lead subject for ESD. However, different shortcomings prevent, that the subject reaches its full potential.

I would like to use this presentation to show how Arbeitslehre supports students in developing competences for sustainable living in general and for sustainable consumption in specific. I will also analyse if the subject is ready to contribute to the needed transformative and transgressive consumer learning and what could be done to increase its impact in this direction.

Among the shortcomings are, that Arbeitslehre plays hardly any role in the curricula for students striving for a higher-level school-leaving qualification and that in general the lessons and resources dedicated to the subject are not enough to fulfil the subject’s demand for breadth and depth. Thus, in practice, the subject is often either taught as a “normal” schoolbook based subject – or as a subject for purely practical work without proper sustainability reflection. In addition, the curricula focus on individual scopes of action to increase students’ perception of self-efficacy, less on existing societal constraints which deserve more emphasize for the needed transformation.

The presentation will be based on conceptional considerations and personal experience, and will deliver propositions for future empirical research. By introducing Arbeitslehre – which has been intensively discussed in Germany, but not beyond – to an international audience, the presentation should also contribute to an international exchange on sustainable consumer learning which could stimulate improvements and further developments.

Examination of Learning Pathways to support achievement of Absolute Reductions in Carbon Emissions

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There is a growing move in science and research to identify and document the societal changes that can be taken to achieve absolute reductions in carbon emissions towards achieving the targets for 50% reduction in emissions by 2030 and reaching net zero emissions by 2050. In their Special Report on Global Warming, the IPCC concludes that limiting global temperature increase will require that demand-side actions are taken and lifestyle changes are made. This has led to multiple attempts to identify and document what 1.5 degree lifestyles may look like and contain, which is based on the scientific recommendations to take drastic actions to limit global temperature increase to a threshold of 1.5°C.

In considering the two reduction targets – 50% by 2030 and net zero by 2050, there are still contrasting pathways and proposals on how we can best achieve these targets. Furthermore, the discussions on how to promote and achieve the needed demand-side actions and lifestyle changes, there are many different views, measures and prescriptions that are suggested which range from consumer awareness raising to strict rationing. While the absolute reductions to achieve the 50% reduction target can be mapped and charted, the same is not so easy when considering the net zero emissions target as this requires wider and deeper transformation to societal systems and infrastructures, as well as fundamental changes in our behaviours and lifestyles.

This paper will examine these targets and pathways for 1.5 degree lifestyles from an educational perspective, and it will consider how education as a primary mechanism for promoting and advancing sustainable development can best be applied to support the achievement of these absolute reductions. In doing so, consideration will also be given to idea that there may be significant tensions between the approaches take to achieve the 50% reduction target and the wider transformations that will need to take place to achieve the net zero emissions target. Drawing on existing discussions in the field of education for sustainable development, it will discussed how these tensions can be addressed and how education can support societal transformations to achieve a low-carbon society.

Between 'Cosmic Order, Truth and Ethical Action': Pedagogical inquiries as a philosophical quest into self, social and ecological consciousness.

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Presenter: Srisrividhiya Kalyanasundaram, srisrividhiya.k@manipal.edu (online)

Today, education for transitions and transformations in a dynamic changing world has become central to pedagogical conversations around the world. Driven by the consumerist culture of an industrialized civilization, leading to a point of the sixth largest mass extinction of species across the world, the need for asking what is fundamental to planetary survival, good quality life for all beings, and creating a world of justice and equality has become imminent. However such a tremendous shift can happen only in the most central space of learning - to recraft a new consciousness and transform the human self to imagine a different world. We need to push the question of how we can develop richer identities of personhood that cross limited boundaries of self-perception in actions related to relationships with the environment, consumption, sustainability, and the transformative roles we can play in the ecological crisis through the potential of education in formal, informal as well as home-based learning contexts.

If pedagogy is to challenge the vicious cycles of consumptive patterns, where must the axis of "self" and "consciousness" in such a discourse be positioned? This paper proposes that the three Indian notions of Rta (Cosmic Order), Satya (Truth) and Dharma (Ethical Action) provide a dynamic revolving axis that can startle pedagogical complacency to raise deeper questions about how we perceive ourselves in the nexus of complex eco, socio-political and personal-psychological systems. Education for transitions in consciousness and self transformation lies at the heart of pedagogical inquiry, and the three concepts provide a new frame for jolting our idea of "consciousness" and "self" in pedagogical contexts. Drawing upon holistic knowledge systems, and the attitudes of humility, integrity, perseverance, discipline, and self-reflexivity in contemplative creative systems of traditional education, this paper reflects on -ananda, a deep joyous state, considered the essence of all seeking in many traditional Indian knowledge frameworks as the essential consciousness element required for deep transformations. The play between Rta, Satya, Dharma and ananda positioned for the contemporary learner-educator in today's environment makes for a compelling reflection of educational practice and creative pedagogy as the author practices in her own work with select examples.

A10: Measures and Methods for Net-Positive and Negative LCA

Session Chair: Delwyn Jones

Room: B: Omnia, R: Spectrum (max. 30)

Any new global development framework must respond to pressing issues of loss of biodiversity, climate viability and equity. Stakeholders suffer fatigue, confusion and indecision from bad-news and disinformation on accelerating global climate and extinction crises. Beyond current damage, loss and risk outcomes the United Nations offers a vision of humanity nature-positive living in harmony with global water, food and climate security. The program depends n large part on new capacity to assess benefit, gain and benefit. With transformation so vital, environmental sciences must now refocus their reach beyond doing less harm to discover new ways to deliver net-positive beneficial outcomes. Investment in such actions demands markets to transform negative outcomes and reveal beneficial measures and metrics to quantify and reach net-positive outcomes. Research shows good news can engage and inspire positive approaches and actions. Apart from scaling up effective and representative action to reverse loss of climate and biodiversity viability, a nature-positive future needs science, investment and action to be driving up gains and reaping benefits of industrial symbiosis. Embedding eco-positive policy frameworks with investment and capacity development can synergize benefits. The session will discuss modelling gains in climate and biodiversity security to:

- explore science-based linkage of ecological risk-benefit predictions
- stimulate thinking about zero and net-positive climate and biodiversity security goals
- discuss risk-benefit analysis and management toward biodiversity and climate resilience
- discuss opportunities for life cycle impact and benefit assessment in industrial ecology
- enable achievable investment in net-positive ethical and sustainable outcomes

Certified quantitative life cycle analysis case studies will be used to demonstrate coupling of benefit and damage assessment to enable net-positive modelling. To generate nature-positive action, efforts must focus on quantifying, benefits, gains, and net-positive outcomes beyond zero damage and loss.

Line-up of speakers:

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Quantifying Biodiversity and Climate Security from Water and Carbon Capture

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Demand for water and fuel inputs to industrial operations typically arise as process feedstock, or fuel, steam or coolant for power generation. While fuel, feedstock and water-security are vital for production, resource recovery now supersedes waste disposal. This work presents literature reviews and case studies of carbon capture and water recycling. It aims to convey the importance of

- climate and water security to maintain natural, community, human, industrial and financial capitals,
- water circularity to meet needs of current and future generations' demand considering climate crises,
- carbon and water circularity sufficient to regenerate natural ecosystems near pre-industrial capacity,
- clean water, effluent, air and emissions to maintain safe operating space within planetary boundaries,
- methods for quantifying net-benefit versus net-harm to report evidence of nature-positive outcomes,
- qualifying messages of higher benefits versus lower damages to better communicate outcomes.

Co-located refineries, power stations and factories making mineral, chemical and fertiliser products in the Western Australian Kwinana Industrial Area share resources and infrastructure. Most rely on fossil fuel and primary groundwater drawn, managed and capped by the State regulator. Allocation limits, however, set in 2004, saw industry increased demand on the local 24 Megalitre/day capacity water recycling plant. New production lines for Lithium and other rare earths drove up demand for fuel and process water. Future higher reclaimed supply uptake will be crucial to meet demand for Hydrogen gas fuel from renewably powered electrolysis. To secure higher demand by 2031, Kwinana's annual recycled water capacity is to increase by 52 Gigalitres. The Sepia Depression Ocean Outlet currently dispenses treated wastewater into marine ecosystems 4.1 km off-shore 20 km from Perth. After extensive groundwater recharging effectiveness studies the Kwinana recycled water system proposed using its Managed Aquifer Recharge. Carbon Capture technology is also under development.

Literature reviews of sustainable water fuel and emissions management methods are discussed. Industrial symbiosis, an industrial ecology subset, generally refers to exchanges between co-located industries of energy, feedstock, by-product and waste-derived material. Many case studies have proven such symbiosis reduces environmental, social and economic loads. Reviews of ecolabelling found quantitative Life Cycle Benefit Assessment (LCBA) showed security and wellness benefits arose beyond Life Cycle Impact Assessment (LCIA) reports of damages. LCIA and LCBA results used International Standard metrics table quantitative indicators. Applications of the Six Capitals Model (SCM) shows carbon capture and water re-use offers business opportunities as well as lower demand for mining, transport and reduced pollution.

New indicators were developed to assess sustainability benefits from Kwinana case studies. Integrated quantified social capital, ecological damage and ecological benefit assessments depict community wellness and security. Methods and examples show how to more effectively report net-damages and net-benefits without negative bias. The work concludes these methods

were practical and more effective for industry and community stakeholders to assess and show benefit than previous sustainable development studies. It shows combined economic and LCA methods can improve communications from environmental science, policy and regulators.

NaturePositive+ Ecolabelling

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Today humanity faces the brink of climate and biodiversity climate tipping points that are too terrible to fully comprehend. The Global GreenTag International (GGTI) Certification Scheme operating under an ISO 19001 Certified Quality Management System has developed and launched a NaturePositive+ Declarations (NP+D) ecolabelling program. Its purpose is so stakeholders find it useful to apply each NP+D message and metric as steps on ladders of progress to and past net-zero carbon toward holistic Nature Positive outcomes. These steps enable transitions toward sustainable consumption-production systems

GGTI is an externally verified ISO 14024 compliant 3rd Party Type 1 Ecolabel certification scheme and ISO 14025 Type III Environmental Product Declaration Program Operator. It has approvals in US, Canada, NZ and South Africa and an Australian Competition and Consumer Commission Approved Certification Mark. GGTI programs are recognised in 172+ countries by major rating tools including the International WELL™ Building Standard, LEED, BREEAM and many others.

The new NP+D product certifications go beyond current thinking on risk mitigation, ethical supply chain transparency, hazards, life cycle analysis (LCA) and circular economy. They report climate and biodiversity outcomes of restoring, regenerating, conserving and protecting 'Natural and Technical Nutrient Cycles'. GGTI identified Shortcomings and gaps in current approaches to these issues were developed NP+Ds as a solution for industry uptake. As yet no other single certification provides the focus and transparency on changing real world outcomes towards Nature Positive.

The work depicts how NP+D aims to provide markets with concepts and a solution to quantify both natural and technical cycles' full scope and benefits as no certification system has before now. To provide one NP+D score for with transparent reporting products, it adapts and integrates available metrics on individual measures. These include Human and Environmental Health; Life Cycle Impact and Benefit; Ethical Supply Chains & Modern Slavery.

The NP+D point-score and weightings of these key indicators are normalised against Product Environmental Footprint global average citizen impacts within planetary boundaries. The work tables these scoring systems to shows its strengths and limitations. The potential for scalability covers from the smallest fixing to buildings.

Recognising that LCA and LCBA are intense and time-consuming processes manufacturers may progressively complete NP+D outcomes over time typical scores are Initially expected to range between -100% to +100%.

As LCBA can define and quantify beneficial gains arising from reforestation, regeneration recycling, recovery, restoration, renewal and resilience operations this NP+D program enables manufacturers to understand and minimise their damages while increasingly deliver carbon and biodiversity benefits.

The NP+D framework draws on substantial international and local work undertaken by International and National Multi-lateral Organisations and Governments and established NGOs, to put together Nature Positive offset programs that provide those parallel biodiversity and carbon co-benefits. Measurable net-positive carbon and biodiversity outcomes may stem from reforestation, regeneration and restoration as well as from resource recycling, recovery, renewal and resilience.

This framework enables stakeholder transitioning to sustainable consumption-production systems.

Messaging Nature Positive Consumption and Production

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The ability to engage, educate and inspire the general public will determine whether the world reaches the United Nations' nature-positive goal by 2030. SETAC's Science and Risk Communication advisory group alludes to an absence of public trust in environmental communications, and the media's focus on "disasters".

The purpose is to reveal that environmental measures and outcomes framed in negative language makes it difficult to relate net-positive consumption and production outcomes. Communication studies highlight problems in that while talk of disaster, or loss-framed messaging, might immediately get an audience's attention, it is conveying real benefits and gains that leads to action. Positive framing of benefits highlights what is possible, promotes autonomy, and fosters sustained engagement, all fundamentals for behavioural change. A nature-positive goal requires use of a nature-positive language by key climate change influencers, scientists, policy makers, and corporations. To retain their position they must stop improvement focused on less damaging outcomes, exemplified in Life Cycle Impact Assessment (LCIA) vocabulary. The paper features nature-positive language grounded in Life Cycle Benefit Assessment (LCBA) offering verifiable ways to translate scientific findings, government policy, and corporate consumption-production action into net-gains.

A desktop review of recent research on public and consumer responses to climate change communication was undertaken alongside an examination of LCIA vs LCBA methodologies and their language frameworks.

Across fields including health promotion, corporate change management, and green advertising, research shows communication and engagement must be ongoing. While loss-framed messaging might capture attention, it can quickly result in feelings of hopelessness and disempowerment. Ongoing engagement and behaviour change requires moving beyond negative or "disaster" language to harness rational decision-making. This messaging needs to answer the why, what, how and who questions that empower autonomy.

Answering these questions meets the fundamental need of individuals for understanding, certainty, capability and connection. Policy makers and corporations wanting people to make different purchases are asking them to change. Driving climate action is a change management activity. Critically, such language needs to show how taking action can contribute to regenerative benefits, and this is the strength of the fully scalable LCBA methodology.

LCIA categories include loss of human health, ecosystems and resource availability. Loss is due to air, land and water pollution, damage from forcing climate change and ozone layer thinning. It is also due to mining and land use change depleting biodiversity, freshwater, minerals and fossil fuel.

Extracts from a policy development paper entitled "Learning to Quantify Positive Futures" by Jones et al contrast positive qualities and measures developed as corollaries to detrimental attributes across a strategic planning framework. In case studies its scalability applies to paper as well as metro systems.

Environmental measures framed in negative language make it difficult to relate positive outcomes. Studies in communication show it is positive messaging which empowers people to take action in sustainable consumption-production systems. Instead of focusing on consumption-production damages, nature-positive language offers ways to translate action into verifiably sustainable gains.

Methods, Evidence and Quantification of Net-positive Outcomes

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The UN Nature Positive Program provides a global impetus for sustainable consumption and production to consider how to reduce climate change and extinction rates and deliver net-positive climate and biodiversity outcomes. Considering the almost unimaginable damages that humanity faces commercial and government responses are hindered by well-justified scientific and political negative literacy and numeracy. Scientific reports of accelerating anthropogenic climate and extinction crises, coupled with negative media attract global responses. But bad news media, marketing greenwash, corporate disinformation and community indecision prevail and reports show people tune out confused and unresponsive. Daily news on inheriting mass extinctions and climatic extremes drives student activism and youth suicide.

The paper addresses problems arising from sciences' current lack of positive wisdom and weight of evidence to support regenerative action at professional, local, national and global jurisdictions. Literature reviews showed most assessment tools covered less to zero loss. Initiatives to guide and assess nature-positive development, plans and policy need messaging, measures and metrics integrated beyond less pollution, damage and loss to net gain. Calls for a nature-positive world demand extending scientific sightlines past damage sticking points to quantify regenerative benefits, gains beyond zero outcomes. This work features a framework of indicators to create less harm and damage by adding benefit and producing net-gain.

It aims to clarify concepts and challenges then review third-party-certified case studies to illustrate core nature-positive numeracy and literacy. This paper employs Life Cycle Benefit Assessment (LCBA) frameworks quantifies security, wellness and supply viability gains versus conventional Life Cycle Impact Assessment (LCIA) of damage and loss. As it offers fully scalable ways to verify net-positive supply and consumption this work can enable stakeholders understand how to transition toward sustainable consumption-production systems. One case study shows results of one biomass feedstock diverter LCIA Vs LCBA. This commercial kitchen undersink grease diverter system separates and removes solids, fat, oil and grease to be recovered to make biodiesel. Compared to no diverter results show one overall net gain and five benefits from reducing damages cradle to grave. Supplementary climate and biodiversity security studies of the authors show net-positive recycled and renewable systems for products buildings and infrastructure. Stakeholders will see how benefit assessment supplementing damage assessment can model climate, wellness, biodiversity and supply security.

It concludes that whilst conventional studies and ecolabels exclude net -positive benefits, their negative bias effectively disempowers wider communications and creates barriers to regenerative and nature-positive initiatives. LCBA offers community, government and business a new tool with examples of methods to measure gains in accelerating restoration and climate security. Reaching to quantify and show positive gains well beyond the negative and zero loss outcomes LCBA enables a good news focus and truer market assessments. This reach offers hope to inspire wider public action knowing that only huge gains can restore planetary controls. To reduce bad news and greenwashing it recommends all stakeholders extend the reach of their concepts and tools to yield positive messages to report positive outcomes.

Nature-positive LCA of Production and Consumption Systems

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Over a half-century, production and consumption systems have adopted robust Life Cycle Assessment (LCA) methods and international standards for calculating impacts in quality control and product ecolabelling. and experience Emerging Cradle to Cradle, Blue Economy, Circular Economy and Nature Positive assessments focus on bringing positive news about products, services or buildings. The problem is that Life Cycle Impact Assessment (LCIA), however, only measures negative damage and loss outcomes. While emerging positive methods could benefit from LCA's robust background, conversely LCA could incorporate benefits assessment.

The authors' Life Cycle Benefit Assessment (LCBA) methods define and quantify beneficial outcomes and gain of tiny integrated circuits to global supply chains. Typical LCIA is depicted covering zero to gross damage versus LCBA from zero to capacity gain. The work reviews concepts, theory and practice of ReCiPe LCIA alongside LCB.

LCIA categories cover human health, ecosystems and resource loss from air, land and water pollution forcing climate change as well as land use change and mining depleting biodiversity, freshwater, minerals and fossil fuels. LCBA categories include human wellness, habitat capacity and resource cycling gain due to clean air, land and water, relaxing climate change. Gain is also due to sequestering emissions, purifying effluent, regenerating land use biodiversity and freshwater plus recycling mineral and fossil fuel feedstock resources.

The work illustrates unsustainable, sustainable and regenerative development in charts of net-damages and net-benefits developed Leiden IE master's students under the author's supervision. Charts shows how preferences may differ when benefits are not excluded. This offers a transformational step in understanding how to transition toward sustainable consumption-production systems. They also show how benefits can be communicated in a transparent way alongside of damages, without risking double counting or greenwashing. Case studies show LCIA of a state capital city 100% post-consumer recycled (PCR) paving aggregate lacked capacity to model or show recycling had any net-positive gains. LCIA of council paving for a state capital city main road are then tabled showing worse damage outcomes from quarried aggregate compared to 100% PCR aggregate. But this lacked capacity to show any net-positive outcomes of recycling versus primary product even by manipulating results to show PCR aggregate has less-worse damages these are still negative outcomes. For another state capital city's PCR aggregate paving both damages and benefits are tabled which show many very significant land use and human wellness benefits from reclaiming instead of landfilling scrap and quarrying rock.

Nature Positive outcomes are only evident in the last case study as they show benefits and damages, whereas the first one show only worse losses from primary aggregate and the second only shows damages.

The authors case studies employing methods to count benefits versus damage show losses compared to gains. They demonstrate net damages as well as net benefits considering unsustainable, sustainable, and regenerative development. Preferences can change considering benefits. Also it shows how benefits can be communicated alongside damages to avoid double counting or greenwashing while inspiring action and confidence.

A11: Rethinking Reduce: A Solutions Framework for Waste Prevention

Session Chair: Vanessa Timmer

Room: B: Omnia, R: Momentum 2 (max. 30)

Join us to explore and shape a Reduce Framework to inform cities, policymakers, and practitioners in acting on waste prevention. This is an interactive world café session where you join with others at the conference to compare two draft Reduce solution frameworks and compelling case studies. The aim is to create a richer and more powerful approach to Reduce. Reduce Reuse Recycle is a common phrase but in practice, reduce is the weakest link. Often this word is used to describe a slight reduction in quantity of a given waste stream either through efficiency gains or through redesign. However, there are many other approaches to reduce including ones that start from sufficiency and from transforming the ways we live. Focused on cities where consumption and waste practices collect and collide, we explore opportunities to intervene and transform daily practices in ways that reveal an array of solutions that support reducing global footprints equitably within ecological limits. We present 2 draft frameworks building on a literature review, an examination of currently used 'waste hierarchies', and discourse analysis of the concept of reduce. We identify the limitations of waste hierarchies, the paradox of reduce, and innovative ways in which the concept of reduce is currently operationalised in niche pockets of industry, economic and social landscapes. This Rethinking Reduce project is part of the Beacon for Sustainable Living co-led by OneEarth Living and the Hot or Cool Institute, with generous support from the KR Foundation. We welcome your participation and insights!

Line-up of speakers: Erin Kennedy Tsunoda, erin.kennedy@oneearthweb.org (online)
Vanessa Timmer, vanessa@oneearthweb.org (in person)

A12: Advances in Energy Citizenship Research in Europe: A critical discussion

Session Chair: BinBin Pearce

Room: B: Omnia, R: Momentum 3 (max. 30)

The concept of energy citizenship is widely heralded for its significant potential to progress transformation towards more sustainable and just societies. However, this nebulous and co-produced concept has been interpreted and applied in numerous diverse contexts: community, policy and academia. Our session for the joint ERSCP and SCORAI International Conference 'Transforming consumption-production systems toward just and sustainable futures' proposes to explore recent advances in energy citizenship research, as well critically reflect on the challenges of conducting research on the topic that is renowned as key to Europe's green transition to a sustainable low carbon future. The session brings together expertise from five of the social science and humanities (SSH) large scale European projects that commenced in 2021, which all share the aim of supporting the Energy Union and undertaking operational research in the field of energy citizenship (ENCLUDE, DIALOGUES, EC2, GRETA and EnergyPROSPECTS). Presenters during this dialogue-debate session will address cross cutting questions that were developed in line with the conference theme and the topic of sustainable consumption. These include:

- How does the concept of energy citizenship include and go beyond sustainable consumption? How is this exhibited across the case studies each of the projects have encountered?

- How does the scale of action affect the types of sustainable practices that are viable for a particular context?

- What are the unique connotations of the concepts of "social innovation", "energy citizenship" and "sustainable consumption/production" and how could each of these concepts be used for mobilizing change on the ground? In which contexts and under which conditions?

While the session call for participants is closed we welcome active participation in this interactive debate-dialogue session.

Line-up of speakers:

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P: Thursday, July 6, 12.15-13.45

P01: Poster Session 1

Changes in energy consumption and CO2 emissions in Lithuanian household sector during the period of 2017-2022 and the impact of environmental awareness and climate change policy

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Genovaitė Liobikienė, Department of Environmental Sciences, Vytautas Magnus University, Kaunas, Lithuania

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Increasing frequency of extreme weather events forced policymakers to take stricter commitments to mitigate climate change. Household sector, which is responsible for one third of greenhouse gas (CO₂) emissions is also important to mitigate climate change. However, there is still a lack of research which analyzed the changes in electricity and energy for heating consumption and caused CO₂ emissions. Furthermore, the aim of this paper is to analyze the determinants as: environmental awareness (environmental knowledge, attitudes toward energy behavior and pro-environmental behavior), climate change policy (renovations, choice of green electricity supplier) and social-demographic variables of electricity, energy consumption and CO₂ pollution in 2022 year in Lithuania. The results showed that energy for heating consumption and caused CO₂ emissions from 2017 to 2022 significantly decreased. Meanwhile electricity consumption increased but caused CO₂ pollution changed insignificantly. Analyzing the main determinants only education level significantly and negatively affected electricity consumption and its CO₂ emissions. Meanwhile environmental knowledge and pro-environmental behavior significantly and positively influenced electricity consumption and its pollution. Energy consumption for heating significantly and negatively depended on education level, environmental knowledge and renovation level. Meanwhile renovation and choice of green electricity supplier significantly and negatively determined CO₂ emissions caused by energy consumption for heating. Thus, these results confirmed the importance of implemented climate change policy, particularly promotion of renovation process and renewable energy consumption.

Just transition: moving toward socio-ecological justice in the sustainable development era

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Just transition has received much attention recently, especially considering the integration of just transition with the sustainability transition. Up to now, research on just transition has paid more attention to social justice, while the ecological justice consideration is still inefficient. However, as we consider sustainable development in the framework of the socio-ecological system, justice to society and justice to ecology should not be considered separately. In this paper, we recall that the trending notion of socio-ecological justice should be an explicit pursuit during the just transition process. Up to now, what socio-ecological justice is, the dimensions of socio-ecological justice, and how to improve socio-ecological justice are still under investigation. In order to finish the research gap, the inductive, deductive, and abductive analysis has been used to determine socio-ecological justice's origin and its increasing dimensions. We figure out that socio-ecological justice originates from the intersection of the development of the socioeconomic system, the development of nature concerning, and the development of concepts and theories of justice. By summarizing the grassroots social movements and also the academic research relevant to socio-ecological justice and the development of environmental justice concepts, together with the distribution, participation, recognition, and capabilities dimension from the environmental justice theory, we figure out that the inclusiveness dimension should be included in the framework of socio-ecological justice in this sustainability transition era. Inspired by the concepts of restorative justice and cosmopolitan justice, the inclusiveness dimension means a broadened scale and scope of socio-ecological justice consideration for humans, non-humans, and ecosystems all over the world. In conclusion, we suggest that more inclusive socio-ecological justice should be an explicit pursuit during the process of just transition in this sustainable development era. This research will be helpful in shedding light on the clarification of the notion of just transition together with the sustainability transition.

Concept of study for co-designing local food policy towards sustainable urban food and nutrition security

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Urbanization is increasing throughout the world and leading to changes in several dimensions. These changes include not only people migration, economic growth, and infrastructure but also public health. Food systems in urbanized communities are not exempt from these trends. The transformation from rural-like to urban-like activities in food systems, as well as food policies, leads to more complex systems than in the past. Thailand is subject to multiple burdens of malnutrition. National survey results show that urban dwellers consume fewer vegetables than people in rural areas, for both children and adults. Therefore, the promotion of a more sustainable pattern of consumption, as well as other elements of the food systems and policy coherence, is essential for sustainable development. The objectives of this study are to understand food systems related to food consumption practices in urban and peri-urban communities in Chiang Mai, Thailand, and to check and, where deemed necessary, co-design community goals and practices of sustainable food consumption for policy planning.

An initial step is to gain an understanding of the current situation and existing food-related activities in the selected communities. Information on food production, distribution, and consumption will be collected. Documentation, observation, and open-ended interviews with community members will be performed to attain information on food systems, especially spatial elements and characteristics of the group of people, as well as their health and nutritional status. Community mapping will be integrated with mental mapping, which will be drawn by community members, to show their point-of-view perception of their area of interaction and the importance of spatial features. Later, a practice-oriented participatory (POP) backcasting approach will be used to include stakeholders in the development of 'images of the future.' Attendees will be asked to brainstorm how those imaginary practices might be transformed in the given timeframe. Scenario images and short descriptions will be developed to provide a clear summary of each scenario's characteristics, and they will be assessed for sustainability according to a set of indicators that cover four aspects of consideration consisting of social, economic, health, and environment. Focus group discussions will later take place on the topic of potential enablers and challenges to practice following the proposed scenarios. Outputs from these focus groups will be considered to modify scenarios to get closer to realistic practices. The last stage of the POP backcasting in this research will be refocusing ideas from earlier steps and developing possible pathways towards the goal scenarios.

In conclusion, community involvement is key to the further development of policies and programs to promote sustainable and resilient cities. This study emphasizes the participation of relevant-to-food actors to gain different viewpoints revealed by various stakeholders on what the future of the food system should be. It will lead to expected outputs of the project's benefits to those communities in return.

Participatory backcasting processes could provide valuable spaces for learning and collaboration. Moreover, the proposed future scenarios would frame the way to drive their action to attain an urban sustainable food system as well as food and nutrition security.

Gardening without peat – Qualitative insights into the social practices of gardeners in Germany

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Introduction: Peatlands are the ecosystems that store the highest amount of carbon. Degraded peat lands are, however, a major emitter of CO₂. From the perspective of climate change mitigation, a reduction of the peat consumption offers a considerable potential for reducing CO₂ emission. To leverage this potential, the German "Climate Action Program 2030", aims to eliminate the use of peat in hobby gardening by 2026.

The relevance of this target becomes apparent considering that Germany is one of the largest peat consumers of the EU. In 2021, the share of peat in substrates for the hobby sector was 48%. Although the hobby gardening segment continuously reduces its peat use, the reduction trend is not sufficient to reach the 2026 target.

We take this as the starting point for our analysis and examine the habits of private consumers with regard to the use of substrates and their purchasing behavior. Our main research question is: How do buyers of peat-free products differ from conventional buyers in their social practices?

We draw on the literature on social practice theory (SPT) in the realm of sustainable consumption, which has gained considerable attention. Core of the SPT in the context of consumption is the understanding that purchase decisions are more than only the demand for products. The focus is on people and their practices, which include routines.

Method: In order to answer the RQ we conducted qualitative interviews: Based upon the pertinent literature we developed and tested an interview guideline. Between May and September 2022, we conducted 44 interviews with German hobby gardeners in three different contexts: home gardeners, gardening in an allotment garden and gardening in urban gardening initiatives. All interviews were recorded and transcribed. We analyze the transcribed interviews using MaxQDA; qualitative content analysis has started and is ongoing.

Results and discussion: Our first (preliminary) results indicate that basic knowledge about peat and the associated problems is widespread; this however does not translate into according behavior of using less peat. The impression of routines in the purchasing behavior is diffuse. In general, the results identify social aspects as not particular relevant for the purchase of any substrate.

While gardeners actively search for information related to gardening, our results indicate that information related to substrates are only retrieved passively (e.g. when talking about other topics). The individual motivation of the gardeners is decisive for the consumption of peat-reduced and peat-free products, but this also applies in principle to all substrates. It is noteworthy that people who are afraid of pollutants pay more attention to peat-free. The only aspect, in which peat-free consumers differ from conventional buyers, is the knowledge about the negative impacts of peat consumption.

The first impression of the results indicates that substrates are an invisible part of the practice of gardening.

Our results help to explain the behavior of hobby gardeners in purchasing substrates and the usage of them. Furthermore, they can inform policy makers in developing further instruments to reduce peat in gardening substrates.

Understanding how cultures of food consumption intersect with environmental sustainability

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In response to the negative environmental, social and health impacts of global food systems, an appealing narrative has emerged around the potential for individual patterns of food consumption to contribute to environmental regeneration and improved food and nutrition security. Culture is widely perceived to play a role in shaping food production and consumption, but its intersection with environmental challenges in the context of sustainable diets is not well understood. The focus of policy and research on sustainable diets is often skewed towards individual behaviours, reflecting the dominance of economics and psychology in climate policy (Shove, 2010). By contrast, although anthropologists have long studied the intersection of culture, food and the environment, their contributions have so far not made in-roads in shaping policy on sustainable food consumption (Wilk, 2004).

This presentation would explore how anthropological approaches to culture and sustainable diets can inform policy innovation related to food consumption. It will be based on the early stages of doctoral research on the relationship between cultures of seaweed consumption in the U.K. and issues of environmental sustainability. Seaweed provides a timely and exciting case study through which to examine these issues: as a low-emissions marine plant, there is increasing interest in its potential to positively contribute to climate change mitigation and biodiversity, as well as nutrition. At the same time, it is consumed as part of both traditional regional cuisines in the U.K. (e.g. laverbread in Wales) and more recently popularised international cuisines (e.g. Japanese cuisine).

Through a review of selected literature from Anthropology, Food Studies, and related academic domains, I would aim to identify 2-3 theories or concepts that could help to elucidate the relationship between culture, food and sustainability. I would then discuss how these concepts could be translated into policy-relevant frameworks which can guide specific interventions related to the transformation of food production-consumption systems. By linking the literature review to my research into the U.K.'s seaweed sector, I would also aim to contribute to conversations about the role of culture in the protein transition and the role of marine plants in discussions about shifting to plant-based diets.

References

Shove, Elizabeth. 2010. 'Beyond the ABC: Climate Change Policy and Theories of Social Change'. *Environment and Planning A: Economy and Space* 42 (6): 1273–85.
<https://doi.org/10.1068/a42282>.

Wilk, Richard. 2004. 'Questionable Assumptions about Sustainable Consumption'. In *The Ecological Economics of Consumption*, by Lucia Reisch and Inge Røpke, 3205. Edward Elgar Publishing. <https://doi.org/10.4337/9781845423568.00009>.

Uncovering the environmental and social impacts of Swedish green pea protein and plant-based meat analogues.

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A shift in terms of typology of consumed proteins is necessary to improve food systems sustainability. Animal husbandry has a high burden on the environment in terms of impacts on land consumption, water usage and greenhouse gases emissions, left alone the increasing society awareness on animal welfare. Moreover, excessive meat consumption can lead to several chronic diseases to human beings. Alternative sources of proteins, such as pulses, plays a fundamental role in decreasing society's dependency on animal ones and have gained in the recent years an increasing interest for the industry. Proteins from legumes processed into meat analogues is one example.

Understanding the environmental and social impacts of this expanding industry segment could pave the road to a wider adoption of these sources of proteins. Further considering environmental assessments there is a lack of data for industrial processing. This research aims to fill this gap by measuring the environmental and social performance of a pea protein supply chain in southern Sweden, aimed to produce plant-based meat analogues (PBMA), through a life cycle perspective, adopting a cradle to final product gate perspective. The rationale behind this study is to focus on real industries, identifying hotspots and different sustainability practices to provide research and companies themselves with support to better design this segment of products.

Data were collected in 2021 and 2022 from Swedish companies operating in the field. ReCiPe 2016 v1.1 Midpoint E was utilized to calculate the environmental impacts related to the different functional units through 18 impacts categories using the software SimaProTM. In terms of climate impact, the results show that for a protein fraction (46%) refined by dry -fractioning agriculture contributes to 72-96% of the impacts. Cultivation and meat analogue production contributed the most to impact categories. Adding the processing of a final product (15% pea protein content) the contribution from the agriculture decreased to 32-78% for 100g of final product considering all 18 impact categories showing the final impact of the product is highly dependent on the processing of the final product which will be discussed further.

For the social assessment the same functional unit will be adopted, with the aim of reporting the positive impacts and social risks associated with the pea protein supply chain. A specific focus is dedicated to the social role of the protein processing stage, located in a restored industrial park in a rural areas of Sweden. SLCA framework will be used to perform a Social Life Cycle Assessment and identify the hotspots for intervention amongst the different stakeholders within the supply chain stage, based on those reported within the revised UNEP/SETAC 2020 guidelines.

Six policy intervention points to foster the protein transition towards sustainability. Addressing repercussions of regime shifts as a prerequisite - it will not work without the farmers.

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"Sustainable food systems" have been claimed by the UN in their report "The Future is now" (2019) as one out of six key levers to reach the Sustainable Development Goals (SDGs) and the Paris Agreement (UN, 2019). Essential in this context is the intensive production and overconsumption of meat and animal products, which significantly negatively impact environmental and human health. Industrial meat production largely contributes to global environmental challenges such as biodiversity loss, climate change and nitrogen cycle disruption (e.g., de Boer and Aiking, 2019; Leip et al., 2015). From a health perspective, high meat consumption, mainly red and processed meat, is associated with an increased risk of cardiovascular diseases, type-2 diabetes, obesity and overweight (e.g., IARC, 2015; Wang et al., 2016). The sustainable protein transition within a broader transition towards sustainable agro-food systems requires holistic policy-making across various policy fields. While considering trade-offs, measures to shift towards sustainable, fair animal and plant-based protein production must be linked to consumption-based measures and integrated into coherent policies. This highly complex task requires innovative frameworks for policy analysis.

In this study, we conducted a policy mapping across fields relevant to the protein transition, including (1) food and nutrition, (2) agriculture and environment, (3) climate policies, on supranational (European) and national levels, using the case of Austria as an example. As a result, this work contributes to establishing a cross-sectoral and multi-spatial approach to foster political coherence. Furthermore, by applying the recently introduced transition framework of "six policy intervention points" by Kanger et al. (2020), we aim to identify gaps in policy activities that potentially hinder the transition. Furthermore, this provides an innovative operationalization of the framework in a national food system context. Key findings show that the stimulation and acceleration of different niches could be identified within all policy fields, while the implementation of regime destabilizing measures (such as targeting reduced meat consumption, or alternative production systems) is largely lacking. Besides this the so far neglect of dealing with repercussions of regime shifts has been identified as a root cause blocking further implementation of destabilizing measures.

Policymakers should, therefore, increasingly consider the following steps for a successful protein transition:

- Promoting dialogue along the value chain
- Rural-urban food coalitions directly link producers and consumers
- Transdisciplinary creation of a shared vision for agriculture
- Incentives and support for farmers to transition to sustainable, diversified agricultural practices

- Eco-social compensation for tax reform based on true-cost approaches
- Overcoming political silos to foster holistic policymaking

Children and Sustainable practices at home: Relevancy of the family life cycle approach to capture the evolving agency of children within their families (and their ability to influence its sustainable practices)

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It has now been well established that a sustainable transition requires a shift towards “greener practices” from individuals, while avoiding the individualization of one’s responsibility. Addressing the need for change of practices to more sustainable ones at an individual level has its limits, among which social relationships and context. The most impactful ones are located within one’s household, where practices are mostly shared and decided through negotiation with siblings, parents, and partners. Research on such sharedness and negotiation is still under-explored, especially involving children, while they are often considered key-actors in the climate change discourses.

As part of a thesis aiming at understanding the role of children in the ability of a household to perform pro-environmental practices, this paper specifically focuses on the relevancy of a family life cycle approach to comprehend the evolution of such practices according to the child’s age. An article centering its analysis around the evolution of opportunities and challenges for green practices according to a child’s age has not been found by the author. Such article can be beneficial to the current discussions regarding children’s agency in pro-environmental changes, as it is likely to evolve with their age, development, and role within their families’ consumption. The literature review includes contributions from the Social Practice Theories, Family Systems Theory and children-focused writings from Environmental Psychology and Sociology. Understanding a family as a system, where practices are negotiated between its members (with unequal domestic power), allows a crossover with the Social Practice Theories, where the (evolving) influence of a child acts as a (un)successful recruitment of carriers for a determined set of practices. On top of the family life cycle consideration, this paper’s approach is twofold in its comprehension of a change within the household: at the adult/parent initiative and at the child’s initiative. This paper attends to bridge the extensive literature on children in Environmental Psychology with the structural perspective of the SPT and Family System Theory, to produce a holistic understanding of the evolution of sustainable practices in families with children.

In conclusion, this article is mainly beneficial to the following discussions: the influence of social relationship within the SPT (family ones in particular) and the agency of children/youth as “agent of change” in the context of climate change.

B: Thursday, July 6, 13.45-15.00

B01: Sufficient Lifestyles and Business Practices

Session Chair: Sara Karimzadeh

Room: B: Atlas, R: Atlas 1 (max. 80)

Energy cooperatives fostering individual sufficiency through field interventions

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An energy transition that truly respects planetary boundaries can only come to pass including the sufficiency strategy. This strategy needs to be implemented at the economic, political and individual level. Energy cooperatives as central actors in the energy transition are especially suited to foster sufficiency behaviour of individuals. They are trustworthy and competent middle actors to communicate sufficiency-oriented lifestyles because they have established social networks and communication within their member community. Therefore, our project addresses the research question: How can energy cooperatives effectively foster sufficiency-oriented lifestyles by means of interventions?

To gain insights, we combined literature analysis, content analysis including 505 websites from German energy cooperatives and 16 interviews with energy cooperative members and experts. Based on the insights from these analyses, a transdisciplinary field intervention was planned and is conducted together with energy cooperatives, to foster sufficiency behaviour of their members. Our contribution will sum up the following findings.

In the literature and content analysis, we found that field interventions to foster individual sufficiency currently still have a strong focus on consumption in private households. Whereas studies of the last decades gave a fairly good overview of intervention strategies to increase energy saving, sustainable mobility or organic consumption, intervention research on fostering sufficiency-oriented lifestyles as a whole, as well as on strengthening civic engagement remains scarce. Yet to introduce social-ecological transformation, all roles of the individual are necessary – from consumer to employee or citizen. Therefore, the field intervention takes a holistic approach on individual sufficiency, focussing both on consumption and engagement.

The interviews indicate that energy cooperative members show a big interest in environmental topics and often already behave sufficiency-oriented in some life domains. Interventions in this target group should therefore address ambitious and impactful behaviours such as plant-based nutrition, car-free mobility or civic engagement. Content analysis of the websites further showed, that the concept of sufficiency itself is rarely addressed by the energy cooperatives. 84 of the cooperatives, however, had published related content such as energy saving tips, encouragements switch to environmentally friendly means of transport or use car sharing offers or even to reduce meat consumption. Moreover, energy cooperatives encouraged their members for civic engagement, e.g., by participating in demonstrations.

A field experiment based on these insights will be conducted in January 2023. The intervention consists of a sufficiency week in which participating cooperative members receive system and

action knowledge and set goals to decrease their ecological footprint and to increase their ecological handprint – i.e., their civic engagement. In a long-term study design, participants are randomly assigned to an experimental group that receives a digital treatment only, an experimental group that receives additional social support and a control group. The sufficiency week's impact is measured by a footprint calculator, self-reported behaviour and intentions. The results will be compared to these measures assessed prior to the sufficiency week. Results of the evaluation will be presented at the conference.

How to do more of less: Characteristics of sufficiency in business practices

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Sustainable transformation towards a circular society, in which all ecosystems and livelihoods are protected and sustained, requires the integration of sufficiency in circular production and consumption practices. Beyond the technological promises to decouple resource use from economic growth, sufficiency measures to reduce production and consumption volumes in absolute terms are necessary. Businesses integrating sufficiency act as agent of change to transform current unsustainable practices along the entire supply chain. Many studies developed theoretical concepts of sufficiency-oriented strategies or business models. However, the research on sufficiency in the context of businesses is still missing insights on the operationalization of sufficiency. Evidences on the reality businesses experience when trying to orienting their business practices towards reduction of consumption and production is essential for research and the transition of practices towards a circular society. By observing the operationalization of sufficiency in 14 pioneer businesses, this study identifies dimensions and practice elements that characterize sufficiency in business practices. With a grounded theory approach and through the lens of social practice theory, this study observed that the practice of sufficiency in business mainly represents a rethinking of business doings on three dimensions: (1) rethinking the relation to consumption; (2) rethinking the relation to others; and (3) rethinking the social meaning of the own organization. Sufficiency practitioners understand production and consumption as a mean to fulfill basic human needs instead of satisfying consumer preferences. They co-create sufficiency-oriented value with peers in a sufficiency-oriented ecosystem and they redefine growth narratives by envisioning an end to material growth. Additionally, this study revealed that care, patience and learning competences are essential characteristics of sufficiency in business practices. Sufficiency practitioners reshape their business doings by caring for others and nature; they demonstrate patience to create slow, local, and fair provision systems; and they accept their shortcomings and learn from mistakes. Integrating elements of care, patience and learning in business practices reduce the risks of sufficiency-rebound effects. Ambivalences between the sufficiency purpose and growth-oriented path dependencies persists for sufficiency-oriented businesses. Further research should investigate pathways to overcome these ambivalences and shortcomings that sufficiency practitioners experience, for instance, by exploring political and cultural settings that foster sufficiency-oriented economic activity.

A culture of consumption or sufficiency? – Investigating influences of the societal consumer culture on individual consumer orientation and behavior in the context of the direct social environment

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Problem statement: Individual consumption is one of the factors responsible for excessive use of resources and a substantial impediment for sustainable development. However, consumption behavior of individuals is embedded not only in influences of the direct social environment but also the societal consumer culture at large. Thus, to understand and eventually change individual consumption, it is necessary to understand different external social influences that impact how individuals consume.

Research questions: The present research investigates to what extent the societal consumer culture influences individual consumer orientation in the context of the immediate social environment. More specifically, this study takes a qualitative approach to understand how individuals describe their consumer orientation and behavior and how these are influenced by and correspond to their direct social environment and their perception of the societal consumer culture.

Theoretical approach: To investigate individual consumer orientation and behavior in the context of consumer cultures, the present research is based on Schein's (1985) three-level culture model. This model conceptualizes culture on the levels of basic assumptions, values, and artefacts. These different levels of culture are explored in reference to individual consumer orientation and behavior, the direct social environment, and the societal consumer culture.

Methods: Interviews were conducted in Germany with five individuals who differed in their level of sustainable behavior. The interview guide was structured along Schein's (1985) culture model and asked the interviewees to describe the different levels for themselves, their direct social environment, and the society. Qualitative content analysis based on Mayring (2015) was employed to analyze the collected interview data.

Findings: Even though individual consumer orientation and behavior differed between the individuals, all interviewees displayed both materialistic and sufficient orientation to different degrees. Further, they all reported some sustainable as well as some unsustainable consumption practices across various consumption contexts such as mobility, housing or leisure activities. In general, all interviewees described their direct social environment as similarly structured when compared to their own consumer orientation and behavior. However, the interviewees also reported differences between their own consumption and their environment's consumption (e.g., conscious differentiation from behavior of close others). Regarding the societal consumer culture, individuals perceived society's consumer culture to large degrees as materialistic while also reporting influences of the societal consumer culture on their individual consumer orientation and behavior (e.g., pressure to consume, high costs to extract oneself from the consumer culture).

Conclusions and Implications: In the context of promoting sustainable consumption practices, it is important to understand the mutual influences between individual consumption, the direct social environment, and society at large. The present study highlights how close others can impact the way individuals consume. Moreover, it shows that the current societal consumer culture is described as largely materialistic, setting the frame for individuals' perception of their own scopes of action. Thus, to change individual consumer orientation and behavior, different external influences of individual consumption need to be considered, including a critical reflection of societal materialistic values.

Lifestyle minimalism and decluttering: Helpful or harmful for sustainable consumption?

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Concepts of simple living, anti-consumption, voluntary simplicity or minimalism have been known for decades (e.g., Etzioni, 1999). However, it was the so-called “lifestyle minimalism” (Meissner, 2019) of Marie Kondo and Co that has brought the idea of “living with less” into the mainstream. In the last years, numerous guidebooks, magazine articles and blog posts have been published on this topic. The central argument in these publications is that the reduction of possessions contributes to a better quality of life and well-being. Numerous empirical studies already exist on the connection between minimalism and well-being (as overview see, e.g., Hook et al., 2021). However, whether and, if so, to what extent lifestyle minimalism and decluttering (as a method to achieve a minimalistic lifestyle) can also help to promote sustainable consumption has hardly been studied empirically so far (as exception see Chamberlin and Callmer, 2021). Until now there are mainly theoretical-conceptual contributions that criticize lifestyle minimalism and decluttering primarily as “neoliberal techniques” that help to sustain and even foster overconsumption and fast consumption cycles (e.g., Meissner, 2019; Ouellette, 2019). Within the framework of a citizen science research project in Germany we explore decluttering and its effects on sustainable consumption (Muster et al. 2022). We also shed light on the question of whether a return into old patterns of consumption and accumulation (or even increased consumption) occurs after decluttering and if so, how this can be avoided. Against this background, we would like to present our conceptual reflections on lifestyle minimalism, decluttering, and sustainable consumption as well as empirical results of the research project. In a first part, we will explain the popular trend of lifestyle minimalism and decluttering and derive possible chances and risks for sustainable consumption. In a second part, empirical results to underpin the conceptual ideas will be presented from a mixed-method approach.

With regards to the quantitative data, we show results from two survey waves with citizen scientists who provided self-reported information about their consumption behaviour and their possessions before and after decluttering. Particularly interesting in this context is to unveil the relative importance of different predictors for the accumulation of things. A preliminary analysis shows that socio-demographic factors, such as education level and size of living space play a more important role than psychological factors, as e.g., material values (Richins & Dawson, 1992). Furthermore, analysis of the second survey wave will be used to determine the extent to which people returned to or reduced their old level of acquisition.

With regards to the qualitative data, we show results from interviews that the citizen scientists conducted with volunteers about their experiences with decluttering and possible effects on their respective consumption behaviour. The results can provide a deeper understanding of the factors that determine whether decluttering contributes to less consumption or the maintenance of existing consumption patterns. Finally, our insights gained so far will be discussed and possible implications for the promotion of sustainable consumption will be derived.

Towards voluntary simplicity: measuring oneness experience with the implicit association test (IAT)

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A call for consumption reduction echoes the views of researchers across many scientific fields as a measure for lowering global waste. Voluntary simplicity has been receiving growing attention as a sustainable consumption lifestyle. Studies based on self-report methods show that voluntary simplicity is positively related to oneness – a transcendence of the self and sense of unity with all of existence – which emphasises the relevance of measuring this variable in consumption studies. However, oneness is not suitable to be self-reported, requiring a response latency technique to access subconscious automatic associations.

Integrated in a PhD research about the impact of oneness on youngsters' consumption of clothing, this study aims to develop a new version of the Implicit Association Test (IAT) designed to determine respondents' level of oneness and relate it to voluntary simplicity. Because oneness experience is a psychological phenomenon, the development of this test and survey relies on experts' guidance and literature in the fields of psychoanalysis and social psychology. This study combines implicit and explicit measures to allow the cross-checking of results and is composed of two data collection phases. Phase 1 reports the results of explicit self-report questionnaires about oneness and voluntary simplicity. Phase 2 reports the results of an IAT measuring oneness on a group of students of science and technology, meditation and cultural regeneration schools, by using oneness-related stimuli words. We present preliminary findings on the relationship between these implicit and explicit metrics. Expected results are that the response latency metrics can reveal which participants experience oneness and its linkages if any to their downward reassessment of need. This study challenges current discussions by bringing oneness into the consumer awareness debate and providing a new version of the IAT that will allow oneness to be assessed and studied in other fields of study.

B02: Plan, buy, cook, eat, repeat: perspectives for sustainable meal choices and food waste reduction

Session Chair: Mariam Nikravech

Room: B: Omnia, R: Quantum 1 (max. 30)

How do consumers handle food in surprise bags at home? The influence of product liking

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Surprise bags (e.g., TooGoodToGo) are well-accepted by consumers for the surprising experience that they provide. These bags contain food close to expiration, at large discounts. However, insights about how consumers deal with food in surprise bags after picking them up are lacking. This is important to investigate because it reveals whether this food is ultimately saved from being wasted or not. Therefore, we aim to examine how consumers deal with close-to-expiration food in surprise bags at home, focusing on the influence of consumers' degree of liking the food. Consumers do not know the food included when purchasing surprise bags, so large variability may exist in the extent to which they like this food.

According to the literature, food liking is a strong predictor of food consumption. Therefore, we expect that consumers tend to eat the food in surprise bags that they like (Hypothesis 1) and discard (throw away or give away) food that they dislike (Hypothesis 2). Meanwhile, food that consumers neither like nor dislike has insufficient reasons to be immediately discarded while is not liked sufficiently to be immediately eaten. Therefore, this neutral-liked food is more likely to be stored than liked or disliked food, which implies that the effect of product liking on storing behavior has an inverted U-shape (Hypothesis 3).

To test these hypotheses, we sent two surveys to users of the TooGoodToGo app in the UK. In Study 1, 196 participants imagined receiving a surprise bag containing one food product that they liked, one that they disliked, and one that they neither disliked nor liked. They reported what percentage of each of the three foods they would eat, store (in a cupboard/fridge/freezer), give to others, or throw away. In Study 2, several days after actually purchasing a surprise bag, 150 participants indicated their degree of liking three randomly chosen foods in the bag (dislike/neutral/like) and reported what percentage of each of these three foods they had eaten, stored, given to others, or thrown out. Data included various covariates, such as motives for buying surprise bags, food categories, and household size.

Using a zero-inflated Gaussian mixed model, results in both studies showed support for our hypotheses: Liked food was eaten more ($p < .001$), neutral-liked food was stored more ($p < .031$), and disliked food was given or thrown away more ($p < .001$). This research is the first to show how consumers handle close-to-expiration food in surprise bags. Important insights are that many food products are liked and eaten and that a large proportion of disliked food is given away rather than wasted. A point of concern is the (mostly neutral-liked) products that are

stored, and for which it is unclear if people eat them eventually. We are setting up a field study to further examine this.

Reducing household food waste by dietary meal planning

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This research aims to reduce food waste at household level by formulating meal plans. One-third of global food production is lost or wasted. This is a problem because food waste is indirectly accompanied by many environmental impacts. Food waste is a significant contributor to climate change, as food waste is estimated to generate 8% of global greenhouse gasses. Of the total food waste in Europe, about 50% is caused by households. One of the reasons for household food waste is poor planning. Poor planning leads to the wastage of food because of, among others, difficulties consumers face with inappropriate packaging sizes and managing leftovers. Diet modelling has proven to be an effective method for solving food planning problems. However, diet modelling has not yet been considered for reducing household food waste. In this research, food waste is defined as “any substance or product, whether processed, partially processed or unprocessed, intended to be, or reasonably expected to be ingested by humans” (EU 2002). Therefore, for example, a banana peel is not considered waste by the EU definition. Currently, in literature, food waste is frequently expressed in weight. However, if the purpose of reducing food waste is to mitigate climate change, other units of measure might be more appropriate. For instance, environmental impact indicators such as greenhouse gas emissions, land use, and water use. Moreover, food waste could be measured as the nutritional contents wasted, for instance, the amount of protein.

A dietary meal planning model is developed to estimate to what extent food waste can be reduced at household level when planning is optimized. Meal plans are formulated by the model by selecting optimal combinations of recipes. The model also considers perishability, costs, overall environmental impact, and nutritional value. The Netherlands is taken as a case study, the Dutch National Institute for Public Health and the Environment and a large Dutch supermarket chain are the main data sources. Meal plans are formulated for a varying number of days and persons.

Analyses are performed to find trade-offs between (food waste) performance indicators. Furthermore, reducing food waste as a means to reduce environmental impact of a diet is assessed. The meal plans formulated can be used to inform on meal planning and to select and promote recipes that are affordable, healthy, and have a low environmental impact.

A Long Night of the Sciences to explore senses

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Food has a resource food print and a health impact. Eating more sustainable is therefore an adequate reaction to respond to climate change and obesity challenges. But what makes it easy to consume sustainable food? What is the role of our senses besides habits, motivation and knowledge? And are the methods applied by researchers on a regularly basis suited to consumers' needs and preferences of expression?

To answer these questions a series of sensory experiences was conducted with 133 people to assess the influence of color, shape and flavor on food perception and appreciation (Piqueras-Fiszman et al. 2012; Piqueras-Fiszman and Spence 2014; Wadhera and Capaldi-Phillips 2014; Spence 2015; Cifci et al. 2021).

Based on scientific literature, our experience series consisted of six different tastings one for each of our sensory qualities (salty, bitter, umami, fatty, sour, sweet). The food samples were cooked by a German two-star Michelin chef to assure they were delicious. Specifically, (i) salt samples with different salt notes (focusing salt overconsumption), (ii) teas with different degrees of bitterness (focusing bitter ingredients regarding biodiversity and digestion), (iii) a naturally glutamate-rich shiitake risotto (focusing low sodium but tasty dishes), (iv) desserts with different fat contents (focusing overconsumption of fatty ingredients), (v) cocktails with varying acids (focusing acids regarding the disliking of sour foods), and (vi) sweet identical drops in different shapes (focusing overconsumption of sweet ingredients) were assessed in the sensory experiences regarding either color, shape or flavor. Contextual factors such as plate size, plate color, or lighting were kept constant. Questionnaires were used to evaluate the taste perception of the participants.

Results reveal that (I) participants were keen and "food adventurous" (Ullrich et al. 2004) in trying different flavor intensities. (II) Shape had a significant influence on taste perception. (III) Not only one but several methods for expressing specific taste preferences should be considered when offering questionnaires for sensory experiences. (IV) Participants did not prefer all sensory qualities equally and there are definite taste limits when offering sustainable dishes out-of-home.

Out of the box: use of meal kits and reuse of leftovers

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Food waste and losses are a leading cause of climate change. The particular household food waste category of leftovers are more likely to be discarded than unprocessed food, and are thus a main factor of household food waste (FW).

Leftover management practices are plural. A latent class segmentation approach gives insights into the sources of heterogeneity among consumers in their leftover management practices. Our study contributes to the literature by identifying patterns of leftover management practices via a latent class analysis. Besides, it demonstrated that several already identified FW antecedents - emotions, personal norms, intention and dinner procurement routines - can also determine the leftover management practices, and analytically, class membership. To enrich respective scientific knowledge, we investigated whether belonging to a latent class with higher levels of positive attitudes toward leftovers, and higher engagement in positive leftovers management behaviours decreases the amounts of dinner leftovers and overall dinner FW.

Meal kits (MK) have emerged since 2012 as a market-driven innovation offering more sustainable food provisioning to cope with the FW problem. MKs aim at providing appropriate quantities to avoid the creation of leftovers and subsequently FW. A study by Heard et al. (2019) showed that a MK can save 2kg CO₂eq/meal compared to grocery store meals. Previous studies suggested that MKs reduced plate leftovers (Hertz and Halkier 2017), or increased the chance of having plate waste (Schuster et al 2022), compared to home-cooked meals. We investigated whether MKs heterogeneously affect dinner leftovers depending on the consumer's leftover management latent profile.

The study was conducted in collaboration with a MK provider. Data was collected in November-December 2019, before the Covid-19 pandemic, in six countries (USA, Canada, UK, Germany, Belgium and the Netherlands). Each participating household received one MK during the study. We collected via an online survey information about leftover-related attitudes and stated behaviours, daily amounts of leftovers (reported in a daily dinner diary for 14 days) and FW, and types of dinner eaten, as well as a feedback survey. The final dataset contains observations from N = 866 households.

The data was analysed via a latent class analysis. Subsequently, we specified step-wise GLMs to estimate the influence of attitudinal factors and dinner routines on latent class membership. Finally, we specified multilevel mixed models to estimate the main effects of leftover management latent class memberships and their interaction effects with the intake of a MK dinner on leftover and FW amounts.

We identified five latent leftover management classes. The most leftover-conscious latent classes were associated with positive intention, personal norms and negative emotions towards FW. We found differences in dinner leftovers amount across classes, and detected heterogeneous effects of MK. One leftover-conscious consumer segment, that we called the "leftover lovers", differed from other segments by creating more dinner leftovers, while a leftover-adverse segment tended to produce overall less dinner leftovers. Two further segments

characterized by overall positive attitudes and behavior of leftover management were producing fewer leftovers when eating from a MK.

Germany saves food: A closer look at behaviour change interventions to reduce household food waste in the framework of a Citizen Science Project

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Food waste generated in the private household sector accounts for almost 60% of the whole food supply chain system in Germany, equivalent to about 78 kg/capita in 2020. The success in lowering food waste at home would considerably contribute to achieving the target 12.3 of the Sustainable Development Goals (SDGs) of the United Nations of halving food waste by 2030. Although countless initiatives have been launched across Germany to reduce household food waste in the past decade, no actual decline has been recorded compared to the baseline 75 kg/capita in 2015. Since only eight years remain before the SDGs are due, it is of urgency to identify effective behaviour change interventions for food waste reduction. Accordingly, it can drive practitioners, stakeholders, and decision-makers to prioritise the implementation of the best-performing activities.

Although the body of research on household food waste is rapidly growing, literature identifying and comparing the success of food waste reduction actions is barely found. If actions are evaluated, the investigations were conducted in different countries and effectiveness was assessed by different methods. To bridge this gap, we developed an evaluation method on the ground of the theory of change and the application of the Motivation-Opportunity-Ability framework. It allows for comparing the effectiveness of various interventions based on the pre- vs. post-intervention analysis. The combination of online surveys and a web-based kitchen diary was adopted for data collection. The prior measure the changes in motivation, skills & knowledge (ability) and in-home food management practices, while the latter assists in recording the amount of food waste within seven days before and after different interventions respectively. The actions understood as interventions with which the household members came into contact were advertised during the already established format of the Awareness-raising week “Too good for the bin! - Germany saves food”. This week aims at drawing attention to the food waste topic nationwide. It took place from 29.9. to 6.10.2022. Taking this opportunity and calling for public participation in scientific research, we announced a Citizen Science Project (CSP) to recruit participants throughout Germany already before and during the campaign week as well as simultaneously cooperated with organisations presenting their work during this week to evaluate their activities. Before and after intervention household data were gathered from May to November 2022. The evaluation is based on multilevel modelling for repeated measures data. Reaching over 1,900 registered participants and encompassing 15 different actions, the CSP sheds light on the effectiveness of various interventions against food waste at the household level in the broad population.

B03: Social Innovation for an inclusive Circular Economy and Circular Society

Session Chair: Jaco Quist, Katinka Quintelier

Room: B: Omnia, R: Podium (max. 269)

Towards an Inclusive Circular Economy for Zero Waste in Indonesia: The Case of Bali

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Circular economy (CE) has become a popular concept worldwide in pursuing sustainable, green, environmentally friendly, and closed-loop production processes in many sectors, including waste management. It has been proposed that CE has the potential to solve not just environmental concerns but also social and economic problems by providing economic opportunities for marginalised groups. One such group is those involved in informal waste management systems in the Global South, where growing waste volumes and limited management are causing pollution and health issues as well as constraining inclusive circular development. In Indonesia, the waste volume is estimated to increase by 82 per cent by 2030 due to the expansion of the consuming middle class, leading to escalating demand for consumer products even as Indonesia struggles with waste management. Waste pickers are at the front line in collecting recyclable waste in Indonesia, and have a significant role in reducing waste in landfills yet are subjected to deplorable and unhealthy labour conditions for low incomes. A circular economy, apart from providing eco-friendly economic growth, can be directed to empower vulnerable groups and enhance economic inclusion. Reflecting on the case of Bali, Indonesia, using literature review, document study and interviews, we suggest that establishing cooperative organisations of informal waste pickers can be a positive strategy for enhancing inclusive circular economy in waste management. Through cooperatives, waste pickers have better opportunities as an integral part of waste management by providing reliable waste collection and transportation from the sources to temporary and final disposal areas, sustaining their vital role in waste sorting and recycling. It is recommended to develop a follow-up proposal to substantiate findings to elaborate and assess potential solutions for the future to ensure waste management in Bali becomes more circular and inclusive.

People at the heart of circularity: A mixed methods study about trade-offs, synergies, and strategies related to circular and social organizing

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An important promise of the circular economy (CE) is the creation of social value alongside increased resource circularity. Yet, while synergies between social value and resource circularity are possible, the trade-offs between social value and resource circularity, and strategies for transforming trade-offs into synergies, are under-investigated. In a recent study, we looked at trade-offs, synergies and strategies through the lens of stakeholder theory, and we adopted a mixed methods approach to reveal the trade-offs, synergies and strategies related to the CE in the Netherlands. We report the results of (1) a three-stage policy Delphi study involving a panel of 47 circularity experts from different sectors (academia, business, government, civil society), and (2) interviews with 27 strategic leaders in circular organizations. The findings show that in the Netherlands, circular organizations create synergies at the organizational and value network level but face significant trade-offs between circularity and social value at the societal level. Synergies are fostered by an ethically motivated communal sharing strategy and impeded by economic motivations. These findings advance current debates in stakeholder theory and unearth conditions that enable and hinder the CE to live up to its social promise.

Towards Circular Economy and Strong Sustainable Consumption through Transformative Social Innovation: a case of Social and Solidarity Economy Cooperatives in Greece

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The consumption of natural resources by modern societies, the related environmental and social impacts, and the possible pathways to reach a circular economy and more sustainable patterns of consumption constitute a significant field of scientific studies. The following research adopts the concept of strong Sustainable Consumption, building on sufficiency, circularity and degrowth, investigating how Greek society can be transformed by the growth of Social and Solidarity Economy (SSE) cooperatives and more sustainable lifestyles. Cooperatives are the most active and legally contextualised form of SSE in the country. After developing a framework based on transformative social innovation, a multiple case study methodology is presented. Four cases, in different areas of Greece, including Athens, Thessaloniki and Orestiada (in the North East), were studied, involving the drivers for the emergence of cooperatives and the sustainable lifestyles pursued.

The results shed light on the ways that cooperatives develop new social relations and new ways to frame, organise, do and know SSE. All cases show elements of strong Sustainable Consumption (practices) and they have to some extent accomplished transformative change, in the sense of broader impacts and diffusion in their region. Concerning their current contribution towards strong Sustainable Consumption, it can be concluded that is still limited, but can be considered as promising seeds for change, locally and nationally. Better governmental facilitation of SSE matters, with respect to the autonomy of the ventures, while establishing strong networks, seem to be necessary actions that will allow SSE oriented cooperatives to influence more individuals and further challenge modern Greek consumption patterns and lifestyles.

Social and cultural transformation towards circularity? Experiences of developing social circular economy indicators in Finland

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Achieving the profound socio-technological transformation from the existing linear economy into a circular economy (CE) is likely to have major implications for the lives and well-being of people. At the same time, the CE transformation necessitates human participation and approval (e.g., Wastling et al. 2018). Hence, the CE transition will inevitably have social impacts, but also require a change in the habits and norms of people, cultures, and societies.

As noted in many previous studies, it is not entirely clear how the CE transition is succeeding in terms of socio-cultural change and fairness of impacts (Mies and Gold, 2021; Padilla-Rivera et al., 2020 & 2021; Pitkänen et al., 2020; Schröder et al., 2020; Walker et al., 2021). Moreover, there is no consensus or one established way of approaching, assessing, or monitoring the social sustainability of the CE.

This presentation reports our experiences of a case study on developing and monitoring pilot social CE indicators in Finland. Research questions included firstly, what kind of social CE indicators can be developed, and secondly, what do these indicators tell about the social impacts and the socio-cultural change towards the CE in Finland.

The pilot indicators were developed through an expert elicitation method. The elicitation built on the UN sustainable development goals (SDG) and social impact assessment (SIA) frameworks (UN, 2022; Vanclay, 2003) as well as the conceptualisation of social sustainability (Vallance et al., 2011; Eizenberg and Jabareen, 2017) and the principles of the CE (e.g., Kirchherr et al., 2017).

As a result, 12 indicators related to sharing economy, the amount and quality of the CE employment, availability of the CE education, and the accessibility of waste infrastructure, proceeded into piloting and data collection. The monitoring results of these indicators show weak signs of socially just development and socio-cultural changes towards the CE in Finland. The main challenges include the difficulty in causally linking the social outcomes to the CE developments and the lack of data for monitoring circularity in general. The study illustrates a dire need for better understanding of the social sustainability of the CE and the development of conceptual frameworks to analyse the interlinkages between the social, environmental, and economic sustainability.

Re-use of PV and social innovation in the city of Amsterdam

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Over the past few years, the number of photovoltaic (PV) solar panels that are being installed in Amsterdam has been growing considerably. The amount of PV panel installations averages an annual growth of 50%, driven by the city its ambition to leave no roof unused by 2040. However, more attention is needed to what should happen with these PV panels once they reach end-of-life (EoL) and must be disposed of and the dominant approach is upscaling recycling, rather than higher level R-strategies. Re-use is a recognized R strategy in a transformation to a circular economy, needs to be put in practice for solar panels. Currently, solar panels are increasingly discarded for economic reasons, not because they've reached their technical end-of-life.

Therefore, in the city of Amsterdam a project is taking place taking a living lab approach using co-creation and piloting the reuse of discarded solar panels, while also investigating how this can contribute to a future inclusive circular economy. The aim is not only to reduce the environmental impact of the PV sector but also to fight energy poverty, and to explore how to contribute to an inclusive circular economy and what kind of social innovation and behavioral change is supportive. To prove that this is possible, an urban living lab approach is applied. Based on a co-creation process we will select several locations in Amsterdam Southeast where we will experiment with installing pre-owned and discarded solar panels, aiming for both social impact and upscaling potential. This is combined with action-oriented research in the living lab to investigate the customer journey and business case for the reuse of solar panels. This includes mapping different user profiles, relevant policy instruments and governance needed for consolidation and upscaling of these local experiments. The study reports on:

- The current approach or end-of-life of solar panels in Amsterdam and the Netherlands and the barriers that hinder the implementation of innovative reuse and high-value recycling strategies.
- developments in the Netherlands and international on innovative reuse pilots and activities for solar panels.
- The activities, learning and results in the re-use PV pilot in the city of Amsterdam.
- Social innovation, customer journeys and business models developed and tested in the re-use PV pilot
- How the city of Amsterdam can facilitate the further development and upscaling of PV panel re-use, including addressing identified barriers.

B04: Sustainable Consumption Communication – Connecting theory and practice (1/3)

Session Chair: Stephan Wallaschkowski
Room: B: Omnia, R: Quantum 2 (max. 30)

The balancing act behind the scenes of coaxing for good:
reconciling the conflict between personal values, objective
reaching, and survival of sustainable consumption apps

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This research outlines how sustainable consumption app (SCA) creators reconcile the conflicts and tensions that emerge from their objectives to coax sustainable living while keeping their apps alive. This study applies mixed qualitative research methods, such as key-informant interviews with 21 SCA creators, to facilitate a comparative analysis between the identified tensions and conflict areas, the Sustainable Gamification Design framework, and ethical considerations suggested for gamification designers. This study sheds light on emergent central themes, such as how apps are communicating sustainable consumption, considerations for using gamification (or not), maintaining neutrality, and providing transparent information, encouraging habit change without making the user feel judged, or maintaining the app without collecting or commercializing personal data, to name a few. Finally, the discussion of this ongoing research suggests how the dimensions of responsible research and innovation can be introduced into the design of sustainable consumption apps to address the ethical tensions and dilemmas their creators face when reconciling their personal values with the realities of being an app among many others.

The Role of Blockchain in The Supply Chain

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In today's rapidly changing society, many new trends are emerging. Most of these trends can be found in the field of digital technologies. Many economic actors, regulators and other actors have already implemented digital and technological solutions to pursue and communicate on economic, social (including health) and environmental goals. However, the understanding of the use and perception of digital technologies among practitioners is limited. This presentation will explore the use of digital technologies in supply chains drawing upon document analysis, including publicly accessible websites of organizations and other sources of information on the use of digital technologies, with a focus on Blockchain. The aim is to identify the role of different actors, in particular consumers, in the use of digital technologies. It will show that actors' participation in the use of digital technologies plays a crucial role. Concretely, consumers are promised to have the ability to verify sustainability attributes on an economic, social, and environmental level. Blockchain, for example, provides information sharing and verification and aims to create transparency for consumers throughout the supply chain and integrate them as part of that chain. The consumer is understood not only as part of the supply chain in terms of verification, as they can make their consumption and decisions based on the information provided, but also as part of a co-governance process. Discussing these developments from a critical perspective, the presentation will show that from a rational choice perspective, this integration seems to provide a globally suitable basis for informed purchase decisions. However, from a sociological perspective, this understanding of consumer behavior encounters many limitations. The presentation concludes with a reflection on a more holistic understanding of consumer behavior in an increasingly digitalized world.

What does climate change (education & action) look like through the lens of youth and social media? Insights from the Clim@venture 1.5 project on the perception and communication of current global challenges from the perspective of the young generation

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In 2017, 102 of UNESCO's 195 member states decided to have a dedicated education focus for Action for Climate Empowerment (ACE What is Action for Climate Empowerment? | UNFCCC) ACE emphasizes empowerment for individual action and independent judgment. Enabling students to actively shape a CO₂- free future shall be achieved through climate education as an integral part of school programs. With this mission in mind, four action-oriented organizations that work from all over Europe on fostering critical media competence, green/climate skills, solution storytelling and youth empowerment, came together to develop a green Erasmus exchange program for schools. Their Clim@venture 1.5 project is co-funded by the European Union through the Erasmus+ program within the Key Action 2 - Cooperation Partnerships in School Education. Clim@venture 1.5 highlights the transformative potential of international virtual collaboration, blended (online & real life) local climate missions (experiments, interviews and scientific/journalistic storytelling), and virtual travel for schools. By producing “4 outputs 4 transformation” (a curriculum for educators, a toolbox with a collection of high-quality learning materials, a videobox with self-guided tutorials and a comprehensive guide 4 transformation) the project accomplishes standardization and digitalization of teaching materials and international exchange formats for a successful climate empowerment of youth. During the project runtime of 21 months, we furthermore design and carry out workshops for multipliers online or as video recordings and tutorials, spearheaded with a need-analysis, that provides the crucial basis to better understand .. a. how high school students perceive the current global challenges and their future b. how they use social media to obtain and share information (about challenges & solutions) c. what is most important to them (general value systems)

The insights of the need analysis will help the project team to tailor its educational empowerment kit to the needs of students and their teachers. In this way, we can better empower them to:

- see their surroundings through a critical lens of (strong) sustainability,
- to develop awareness to act climate-friendly and engage for a sustainable future
- achieve more reach, motivation & more reduction of CO₂- emissions with their actions

The results of the need-analysis will be presented in this session to allow all of its participants to get a better sense of what the perspective of young people really is. This can help not only the project team, but inform everybody designing research, education or action projects and/or working in policy shaping to take these important youth perspectives into consideration. The Clim@venture 1.5 project is monitored and scientifically accompanied by Dr. Ashley Colby who is an environmental sociologist serving on the SCORAI Board (Sustainable Consumption Research and Action Initiative) and engaged in the Future Earth KAN (Knowledge and Action Network) on Systems of Sustainable Consumption and Production.

Additional info on the session format: Our session will possibly feature a breakout session in order to collect feedback and exchange insights from and with participants. We actively invite the

Future Earth community to come and share good sources & materials for climate education, solution storytelling and critical thinking/media competence for our toolbox 4 transformation.

Sustainable consumption communication: A review of an emerging field of research

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Communication plays an important role in promoting sustainable consumption. Yet how the academic literature conceptualizes and relates communication and sustainable consumption remains poorly understood, despite growing research on communication in the context of sustainable consumption. This presentation provides an introduction to the academic session by introducing a first comprehensive review study of sustainable consumption communication (SCC) research as a young and evolving field of scholarly work. Through a systematic review and narrative synthesis of N=67 peer-reviewed journal articles, we consolidated the research conducted in this field into four distinct types: communication as an approach to (1) behavior change, (2) self-empowerment, (3) systems change, and (4) reflection on current discourses and practices around sustainable consumption. Our findings reveal that most journal articles focus on incremental changes in individual consumer behavior (“weak” sustainable consumption) and employ communication as an intervention tool with little reference to communication science and theory. They also reveal integration challenges arising from the disciplinary diversity and fragmentation characteristic of the research field. Future research should develop shared frameworks and terminology, diversify its foci, synthesize relevant evidence, and innovate critical perspectives that go beyond one-way business-to-consumer communication. The results of our review can serve researchers engaged in sustainable consumption communication to better systematize their efforts and contribute more effectively to changing systems of consumption in the future. To put the framework to use, we will contextualize the other contributions to the session in the framework.

Exploring the Impact of Blockchains on Trending Consumption: Tracing Compliance and Enhancing Transparency through Technology-Enabled Reporting

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Fashion trends focused on Sustainable Lifestyle have a potential of controlling and changing consumption volumes and values by demanding visibility for sustainable (Ethical Environmental Equitable and Economical) practices along the global supply chains of textile & sports manufacturing supporting Fashion Industry. Consumers responsible choices and demand for transparency and accountability impact consumption material and production processes. Global value chain transparency requires collecting, validating and effectively communicating data along multiple tiers of stakeholders. Accountability is enhanced through spotting and sharing accurate picture of potential environmental and ethical issues at the farthest tier of the fashion industry supply chain.

Our presentation is part of a session proposed by Future Earth KAN Working Group on “Communicating for Sustainable Consumption and Production” (WgCoCo), aiming to foster a transition to sustainable lifestyles through research and activism in and through communication. Our presentation talks about trends, tools, and technology to support sustainable consumption communication along global value chains. It showcases ‘use cases’ from the fashion/textile/sports industry in Pakistan to explore:

- What role communication plays in establishing trends to encourage sustainable fashion and style
- How responsible communication in the fashion/style industry spreads positive environmental and ethical and economic impacts along the supply chain for its multiple stakeholders
- Why continuous credible communication and traceable mechanism of consumption and production processes along the supply chain build consumer confidence
- Who benefits from action research on sustainable consumption communication

The traceability and knowledge of responsible practices is ensured through transparent reporting mechanisms and strengthened using future technologies. Trends, transparency, and traceability depend on communication expending future technologies. We will explore future technologies like (e.g. Blockchain, IoT) as a digital enabler for value chains responsibility and sustainability. It is important to acknowledge the potential and opportunities of blockchain technologies to bring visibility to value chains and alignment with global goals and standards enabling stakeholders to trace and track relevant information.

B05: Everyday futures: Visioning methods for public engagement with sustainable lifestyles

Session Chair: Catherine Cherry

Room: B: Omnia, R: Quantum 4 (max. 30)

Reflexivity through participatory workshops in Switzerland: the significance of sufficiency, wellbeing and collective solutions for sustainable energy futures

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Current un-sustainable energy usage patterns require new reflections on what it means to live sustainably in the future. When it comes to energy scenarios, such representations of the future are often developed around technological solutions that are not always comprehensible nor relatable to people's lives. This paper proposal will discuss the results of a project that seeks to bring forward new discourses on sufficiency-oriented, collective and inclusive energy futures, through the use of 'personas from the future' living fictive slices in life in 2035; based in Switzerland, each persona represents one necessary step towards net zero 2050. The participatory workshops conducted in Switzerland (n=140 citizens) had three aims, which we discuss: 1) relating the personas to understandings of the good life, through a needs based approach, 2) discussing trade-offs between energy reduction potentials and the good life, and 3) reflecting on necessary changes, collective and individual, towards the normative goal of the good life in an energy transition. The results demonstrate that people can reflect on social change in the present, moving beyond personal practices towards more collective forms of change that would be necessary for the future. The participants were also able to discuss alternative ways of satisfying needs, distinguishing them from satisfiers, and reflecting on necessary changes. The need for changes being supported at an institutional level was seen as essential, towards a more equal energy transition. The group dynamics of the workshops were a promising forum for encouraging reflexivity around social change, but remain at a rather small scale. We reflect on ways in which such citizen forum discussions can be amplified and replicated.

Practitioners' perspectives on improving ready-to-eat food vending in urban Nigeria: a practice-based visioning and back-casting approach

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In many parts of the world, food consumption is shifting from mostly home-based to out-of-home due to transforming everyday lives as a result of urban development and changing infrastructure. This trend has spurred the expansion of informal ready-to-eat food vending particularly among the urban poor. However, there are many concerns about the safety and diversity of food purchased through ready-to-eat food vending. This paper explores strategies, suggestions and empirical evidence on how the provisioning of healthy and diverse food in informal ready-to-eat food vending can be improved in urban Nigeria. A social practice-oriented approach combined with participatory future visioning and back-casting was employed in a multi-phase process of interlinked focus group discussions and workshops involving key food sector stakeholders. The findings reveal that increasing diversity of the food provisioned and integrating fruits and vegetables in meals is a starting point to improve dietary health. This requires changing food norms and promoting sensitization to the importance of diverse diets through training initiatives involving primary actors. Furthermore, transforming skills, materials resources, and capital as well as addressing the relationships between food vending and other food-related provisioning practices within the food vending environment are essential components of transitioning to healthier and more diverse food provisioning in the informal food vending sector. Our findings provide insights for policymakers to provide strategic pathways for practical interventions to improve food vending practices that meet the food security and nutritional needs of the urban poor.

Characterising disruption: persona assisted exploration in elucidating the biographical and cultural implications of heat decarbonisation

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Domestic heat decarbonisation has for some time been framed as a 'disruptive and uncertain' process, entailing costly changes to the fabric of homes and the everyday consumption practices of their inhabitants. Such changes threaten to destabilise longstanding cultural assumptions regarding the role of private property and choice in the domestic sphere, complicating relationships between citizens and the state; landlords and tenants; consumers, heating and energy suppliers. Such disruptions extend beyond the material components of heating and housing, into constantly unfolding practices of homemaking and care provision intimately bound up with the formation of identities and emotional attachments. In this paper, we deploy persona assisted exploration to examine how potential low carbon heating choices may impact relationships between citizens and their homes. Drawing on data from deliberative workshops with citizens representing a diversity of housing archetypes and tenure profiles (n=45) in Liverpool, Gloucester, Cardiff and the Scottish Borders, participants were presented with choice scenarios facing a range of fictional personas designed to live in 'areas like theirs'. By framing deliberations in light of the life of a sympathetic avatar, the use of personas enabled discussion of domestic disruptions in light of familiar domestic pressures of space, financial and caring responsibilities, and family ambitions underpinning anticipated lifecourse trajectories and feelings of ontological security. While such discussions did not over-ride more techno-economically framed considerations of capital and operating cost or environmental impact, they provided a more textured characterisation of the emotional and cultural disruptions that may be experienced as heat decarbonisation programmes develop. In so doing, we aim to show how persona assisted deliberation can be of value in untangling the everyday inconveniences that may attend any process of domestic or infrastructure upgrade, from disruptions to those aspects of domestic life which help shape feelings of autonomy and identity.

Radical futures for everyday lives: a personas-based approach to imagining low carbon lifestyles

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We know that if we want to tackle climate change and limit global temperature rises to within 1.5°C, a rapid transformation will be required in every sector of the economy and society. We also know that technological solutions, such as carbon capture and storage and zero-emission airplanes, are not yet proven. As such, this goal cannot be achieved with substantial cuts to the emissions associated with everyday lifestyles, such as those produced through four key areas: how we heat our homes, how we travel, the food we eat, and the things we buy. In the UK, public concern about climate change is at a record high, with 70% of people believing that drastic changes are needed in the way we live in order to tackle climate change. However, questions remain about what transformational lifestyle changes might actually look like. With the public so deeply embedded in the success of such a transformation, it will be essential that any transition is shaped by what is socially acceptable/desirable, taking account of the existing local context and community.

Here we present a novel place-based method for exploring low carbon lifestyle change, with participants (N=46) chosen to reflect a wide variety of different lifestyles around the UK. Six two-day visioning workshops were held with residents of three UK locations (the cities of Manchester and Aberdeen, and the rural South-West of England), designed with the aim of encouraging deeper reflections of the implications that transitioning to 1.5°C lifestyles might have for wider society. Participants were first introduced to a set of 38 low-carbon lifestyles cards, that provided participants with details of a range of possible lifestyle changes for each of the four key lifestyle areas listed above. Following this, the workshops took an approach more akin to that adopted by futurist practitioners, allowing an imaginative exploration of what a 1.5°C future might look like in their city/area and what this might mean for the lives of people living there.

Our persona-based approach asked small groups of participants to develop a series of characters or 'personas', within the context of their local area, using these to imagine what their neighbourhoods and communities might look like in 2050 and how the different low carbon lifestyle card strategies might be adopted in different ways to create a fair and sustainable future. Providing insights into public motivations for and resistance to change, we show how situating futures within the local context can allow for a more nuanced understanding of the themes that arise within public deliberation. Presenting personas from each of our locations, we highlight how the importance of co-benefits, wellbeing, fairness and social norms, as well as the lasting impact of the COVID pandemic, influence our participants' perceptions of future low-carbon transformations. Our findings thus demonstrate how our approach can help publics engage effectively with thinking about the future by aiding them to explore the deeper emotional and ethical dimensions of low-carbon lifestyle strategies.

Envisioning net zero futures: What do people in China, Sweden and the UK consider desirable and feasible for a net-zero 2050

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Radical change is needed to have a chance at meeting climate targets and limiting the detrimental effects of climate change. A major challenge will be to strike a balance between systems and individual change, especially with regard to reducing resource-intensive consumption patterns. A better understanding of what people consider desirable and feasible for a net-zero future plays a key role in achieving these. Place-based visioning workshops are an innovative approach to addressing the challenges ahead.

We conducted place-based deliberative visioning workshops in China (N= 29), Sweden (N= 32), and the UK (N= 46). In the workshops, we explored futures that incorporate ideas such as a sharing economy, collaborative community growing projects, shared mobility options, and economic models and values underpinning transformations towards low-carbon futures. Four workshops conducted in Chengdu and Shanghai (China) provide an insight into how people in one of the fastest growing economies envision a net zero future, dominated by a tension between economic growth and the motivation to create a future that is liveable for future generations. Four workshops in Gothenburg and Stockholm (Sweden) give a glimpse of what people in one of the most progressive countries consider possible and what has already been learned from existing initiatives to reduce carbon emissions. And six workshops in Manchester, Devon, and Aberdeen (UK) highlight the crossroads we are facing to radically transform our lifestyles, places, and systems in places that are differently affected by low-carbon living (e.g. due to dependency on the oil industry, farming, or urbanization).

Findings show that in Sweden, many of the net-zero strategies discussed were seen as temporary pathways to pave the way but were considered not radical enough. In contrast, participants in the UK expressed mixed affinity towards more radical approaches (e.g., living car-free; no flying). In China, the role of technology, clean air, and community living played an important role in future visions. The findings emphasize the critical interplay between individual and system change. Methodologically, place-based deliberative workshops highlight the importance of societal, cultural, and economic systems when exploring net-zero futures.

B06: Towards the reduction of meat and dairy eating – consumers perception, motivation and barriers (1/2)

Session Chair: Dominika Maison, Katarzyna Stasiuk
Room: B: Omnia, R: Quantum 3 (max. 30)

Psychological differences in reactions toward meat reduction – segmentation analysis of Polish consumers

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Problem statement. Meat reduction is currently an increasingly important topic in the context of nutrition. There is more and more talk in the media that people should reduce the amount of meat they eat for health, ethical (animal welfare), as well as ecological (environmental protection) reasons. The aim of the study carried out was to segment consumers by attitudes toward meat consumption, reduction of meat consumption and openness to meat and dairy substitutes in order to understand the psychological factors underlying the motives and barriers to reducing meat consumption.

Method. A two-stage study was conducted: (a) a quantitative survey on a nationally representative sample (n= 1024) and (b) a qualitative study – 36 individual in-home individual interviews (ethnography).

Results. Based on factor and cluster analyses, 6 segments of consumers who were very different in their approach to meat consumption and meat reduction were extracted:

(1) Sensitive Vegans (11%). A segment with the female majority (80%), well-educated, working but not very satisfied with life. They eat vegetables and fruits the most frequently among all segments. They are vegetarian and vegans or are “on the way” to it – eat meat least often and are trying to reduce it more.

(2) Open to Novelty (18%). Highly educated, high income, high life satisfaction. Very open to new food. They eat meat, but they would like to eat less. They are eco-friendly in their consumer choice.

(3) Traditional Retirees (19%). The oldest segment, most are retired, 66% of women. In food, it is important for them that it is healthy, natural, homemade. The most food neophobic – they don't want to try new food. They are ready to limit meat because of health issues and price.

(4) Younger Conservatives (13%). Conservative, religious but relatively young. They eat little fruits and vegetables, eat meat. They are food neophobic, do not trust new food. They might reduce meat consumption in the future, but they are not ready for it at the moment.

(5) Meat Loving Mucho (23%). The most masculine segment (67%), relatively young, working. They eat meat without any restrictions. In food, they pay less attention to ecology, animals, politics, weight control and naturalness than other segments. Eats the most meat (red meat, cold cuts, snacks), and at the moment nothing convinces them to give up meat.

(6) Lost indifferent (15%). Most dissatisfied with life, nothing in life is particularly important to them, and most things are indifferent to them, the least active and social. They do not care about food, animals, ecology. They eat meat – ethical and health issues are completely irrelevant to them and not convincing.

The second study, based on ethnographic individual interviews, served to gain an in-depth understanding of each segment and explore their openness and barriers to meat reduction. Conclusions and implications. Moreover, it showed that not everyone is appealed to by the same arguments to changing their current eating habits. Understanding the diversity of motives and barriers of different groups (segments) is helpful in developing effective outreach strategies to reduce meat consumption.

Packaging, label, appearance, type of insect - what influences the perception of insect-based foods?

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Rich in digestible protein, insects are widely considered to be “the food of the future” and a good substitute for meat. However, westerners generally reject insects as an ingredient of food products and meals. It seems that the main psychological barriers to consuming this kind of novel food are disgust and fear. The aim of our studies was to assess different factors that may play a role in the perception of insect-based foods. In study 1 (n=99), we wanted to see how explicitly labeling food as containing insects and/or implying it by manipulating the appearance of food influences the participants’ perception of food products or their behavioral reaction to such products. The results showed that products labeled as containing insects are consumed with reluctance and in lower quantities despite their appearance. In study 2 (n=659), we confirmed this effect in the online study, and the analysis showed that the presence of an insect content label has a negative effect on the evaluation of the product. The effect is greater when an insect content label is combined with an actual image of an insect. Next, to understand the specificity of insects among other animals, their characteristics as a potential food source, and to examine what makes some insects more acceptable as food than others, we conducted two complementary studies (qualitative and experimental). The qualitative study (18 IDIs) allowed us to identify the dimensions that determine the perception of insects as potentially edible and inedible. In the experimental study (n=437), we examined the potential of three different types of insects (larvae, ants, crickets) as food ingredients. The results showed that foods containing insects scored lower on each dimension. Furthermore, we observed a different impact of various insects on product evaluation: products containing crickets were evaluated higher than those with larvae. In addition, we noted some individual differences in the acceptance of insects as food. Our studies suggest that the way insect products are advertised makes a considerable difference in the evaluation of those products. The results of the studies showed that the manner of communicating information on insect-based ingredients has a huge impact on the perception of the product and its future marketing success. Placing such products on the market should be preceded by extensive consumer research conducted with a view to selecting the right message and labeling to eliminate that negative effect.

Predicting meat consumption from concurrent, automatic appraisals: Introducing nuance to product appraisals.

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Problem statement: Meat production considerably contributes to climate change (Sakadevan & Nguyen, 2017), yet global meat consumption continues to grow (McGuire, 2015). This issue underlines the importance of understanding what factors promote meat choices over plant-based alternatives.

Theoretical approach: One of the most influential ideas in contemporary behavioral science is the notion that behavior is driven not only by carefully constructed opinions but also by cognitive processes that operate under automaticity conditions (e.g., Kahneman, 2011), i.e., in the absence of awareness, certain goals, substantial time, and/or substantial cognitive resources (Moors & De Houwer, 2006). To gain a full understanding of consumption decisions, it is thus essential to take into account automatic product appraisals (Bargh, 2002).

Research questions/aim: We measure explicit and automatic appraisals of meat and plant-based items to examine how these appraisals relate to a range of outcome measures, including self-reports of likelihood of purchase, intention to reduce meat consumption, willingness to pay, frequency of meat consumption, and Body Mass Index.

Methods/inquiry approach: Past research linking automatic appraisals to meat consumption has predominantly examined generic appraisals (e.g., positive/negative) of meat and vegetarian stimuli. Especially in the context of meat consumption, this approach seems inadequate, as conflicting product facets may play a role in the preference of meat-based vs. plant-based diets (e.g., sustainability vs. taste vs. healthiness). To solve this problem, we use the Implicit Attribute Classification Task (IMPACT), i.e., a novel implicit measure that has been specifically developed to capture multiple (product) attributes simultaneously (Altenburg & Spruyt, 2022, submitted).

Findings and conclusions: Our findings suggest that the automatic appraisals as measured by the IMPACT (a) represent unique constructs and (b) vary in the degree to which they determine behavior. In addition, variation in the prediction of the outcome variables suggests that the appraisals captured by the explicit and automatic measures differed.

Practical and scientific implications: We contribute to a better understanding of the factors that favor meat choices over plant-based alternatives. This is not only theoretically relevant, but also has important practical implications for marketers of sustainable products, such as meat substitutes. In addition, we are introducing a novel diagnostic instrument that allows multiple automatic appraisals to be measured simultaneously.

Vegetarian is Less Caloric?! Why Vegetarian Protein Choice May Increase Calorie Consumption

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Despite the importance of reducing meat consumption to fight climate change, there is limited literature documenting consumers' perceptions of vegetarian protein sources. The market for meat-alike products has grown exponentially over the last few years. In 2021 only, the sales of plant-based meat-alike products increased by 27% in the United States. Despite the extensive research on vegetarianism, there is scant work on consumers' perceptions of meat-alike vegetarian products and even less evidence of the behavioral consequences of adopting such products. This research explores how non-vegetarian consumers assess meat-alike vegetarian products in the marketplace and the behavioral consequences of choosing this type of product. Six studies demonstrate that consumers spontaneously consider that meat-alike vegetarian proteins are less caloric than animal proteins, a bias we named the "vegetarian protein = less caloric" intuition. Studies 1 and 2 show that consumers regard vegetarian protein as less nourishing and healthier than an equivalent animal protein (Study 1), which leads to lower calorie estimations. This effect holds even when the objective amount of protein is the same across vegetarian and animal sources, and consumers know this information (Study 2). The "vegetarian protein = less caloric" inferences lead consumers, having selected a vegetarian protein source, to compensate by increasing the portion size of protein (Study 3) or by selecting more caloric side dishes to accompany it, thus increasing the total amount of calories in a meal (Study 4). With a field study (Study 5), we provide additional support for the finding that consumers who select a vegetarian protein source choose more food to accompany it and increase the calorie content of the overall meal. Finally, Study 6 replicates the behavioral consequences of the bias and tests if calorie inferences mediate the relationship between protein type and food choices. Our empirical package demonstrates that non-vegetarian consumers systematically perceive vegetarian protein sources as less nourishing and healthier and therefore less caloric than equivalent animal protein sources. The "vegetarian protein = less caloric" intuition is important for marketers and public policy makers because choosing vegetarian protein sources leads consumers to select bigger portions (+11.3%) and increase calorie intake (+34.1%) through compensatory behavior. This research also provides relevant insights for policymakers facing the challenge of promoting the reduction of meat consumption.

The consumer perception of plant-based dairy alternatives in Poland, Germany, France, and UK: qualitative and quantitative approach.

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Dietary habits in Europe are changing. Every year more and more people are deciding to restrict animal-based products in favor of plant-based foods. This trend is reflected by the rising popularity of plant-based alternatives, not only to meat but also to dairy products. Numerous studies have investigated the nutritional values of plant-based alternatives. However, consumers' perspectives on this, which entail people's needs, expectations, and knowledge of plant substitutes, are still not well understood. We have conducted two studies in four countries to fill this knowledge gap.

The first qualitative study (24 focus groups, 154 respondents) aimed to investigate the potential of plant-based dairy alternatives, including consumers' motives and the barriers to embracing this food category. It was conducted in three countries: Poland, Germany, and France. The study allowed us to describe the reasons for using dairy substitutes (curiosity, health reasons, influence of others), their perceived advantages, and the barriers to their use. The study also showed that the role of dairy differs between the surveyed countries and is related to culinary traditions. As a result, attitudes towards and motives for using dairy substitutes differ in the different countries. The second, quantitative study on representative samples (N=2100) was conducted in three countries: Poland, Germany and the UK. The aim of this study was to quantitatively validate the results observed in the first study. Moreover, we aimed to investigate the consumer attitudes towards dairy as well as psychological determinants of consumers' perception of plant-based dairy alternatives. The results are in the stage of analysis.

Overall, our project has allowed us to better understand the consumers' motives and barriers in terms of reaching for plant-based dairy alternatives. In contrast to meat, where awareness of its harm to the environment and negative impact on animal welfare and consumer health is high, the dairy reduction is still a major challenge due to the many consumer barriers to alternatives, the deep grounding in dietary traditions, and the strongly held belief in the health benefits of this food category.

B07: Sustainability Transition: Towards a social-psychological understanding of human motivations within the production-consumption system (2/3)

Session Chair: Soumyajit Bhar

Room: B: Atlas, R: Atlas 2 (max. 80)

Sustainability Transformations: Can we Leave it to the Lifestyle Choices of the Young Generations?

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Global efforts to deal with unprecedented sustainability challenges—climate crisis, pollution, biodiversity loss, overconsumption of natural resources—tend to focus on supply-side, technology-based solutions. Yet, rapid, large-scale societal transformations also require fundamental changes to deeply rooted consumption practices and lifestyles. Additionally, and perversely, the supply-side focus also constrains young generations' in defining a sustainable future in their terms. Answering how societies can more effectively navigate transformations towards a desirable sustainable future is not trivial because the dynamics are complex, with supply- and demand-related factors—individual's willingness to change, social/peer influence, control of capital—deeply intertwined, and unbalanced across generations. To help better understand transformation challenges towards sustainable consumption practices I develop a stylized model characterizing the above-mentioned factors jointly and interactively as a system of multiple positive feedback loops, giving rise to tipping behavior. Analyzing the dynamics through simulations I find that policies promoting uptake of sustainable lifestyles among young generations (having greater willingness to change) are critical to accelerate societal-level transformations at scale. However, leverage remains limited as long as capital investments (being mostly under control of older generations) do not support these lifestyles; additionally, there is risk of negative side-effects from relatively overburdening the young generations. My findings suggest the potential high leverage from supplementing demand-side efforts with granting young generations greater control over capital investment choices. I discuss broader implications, including that facilitating and accelerating sustainability transformations requires multi-pronged approaches cutting across domains. Finally, methodologically, this paper offers novel approaches for analyzing dynamically complex systems.

Linking improved wellbeing, consumption space and low energy demand pathways

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This paper relates recent work on low energy demand pathways for meeting climate change mitigation goals with work on fair consumption space and consumption corridors. In most industrialised countries, including the US and UK, energy policy for achieving climate change mitigation towards the 1.5°C goal has overwhelmingly focused on developing renewable energy and other low carbon forms of energy supply, including carbon capture and storage, and has neglected measures aimed at reducing over-consumption of energy and material goods. However, in recent years, analysis has begun to explore the role of demand-side mitigation measures to enhance equity and feasibility for climate change mitigation. Low energy demand scenarios have been developed at a global scale, differentiating between Global North and Global South countries (Grubler et al., 2018), and for the UK (Barrett et al., 2022). These low energy demand scenarios are argued to maintain or enhance wellbeing for the majority of citizens, whilst addressing over-consumption of energy and resources by a rich minority. Support for this view was provided by expert elicitation of the impact of demand-side mitigation measures on 17 wellbeing indicators, based on the UN Sustainable Development Goals, showing positive wellbeing impacts for most measures and indicators (Creutzig et al., 2022). Here, we report on recent work in which we collected survey and focus group evidence relating demand-side mitigation measures with positive wellbeing outcomes for two city-regions in the UK: Greater Brighton and North of Tyne. This has shown that household energy efficiency measures, affordable public transport and sustainable/recycled building materials scored most positively in terms of contribution to overall wellbeing. Finally, we suggest how this work could contribute to, and draw on, work in sustainable production and consumption on fair consumption space (Akenji et al., 202), and consumption corridors (Sakahian et al., 2021). This work relates meeting human needs and enhancing wellbeing with the idea of maximum and minimum consumption standards to promote justice and equity.

References

- Akenji, L et al. (2021), 1.5 degree lifestyles: Towards a fair consumption space for all, Hot or Cool Institute, Berlin.
- Barrett, J et al. (2022), Energy demand reduction options for meeting national zero emission targets, *Nature Energy* 7, 726-735.
- Creutzig et al., (2022), Demand-side solutions to climate change mitigation consistent with high levels of well-being, *Nature Climate Change* 12, 36-46.
- Grubler, A et al. (2018), A low energy demand scenario for meeting the 1.5 °c target and sustainable development goals without negative emission technologies. *Nature Energy* 3, 515–527.
- Sahakian, M et al. (2021), Advancing the concept of consumption corridors and exploring its implications, *Sustainability: Science, Practice and Policy* 17 (1), 305-315.

Proposition of a scale for measuring sustainable marketing actions in food service businesses

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Problem statement: understanding the antecedents of and, consequently, raising the level of sustainability in marketing in the food service sector is an important condition for the development of these organizations, since companies in the segment are one of the main stakeholders of the food service system. The idea arose from verifying that the papers identified presented a body of significant scales, but were sometimes fragmented (in different studies), measuring parts of common or different concepts, with the absence of one single instrument covering all dimensions and their respective measurement scales.

Research aim: this study aims to propose and validate a scale for measuring sustainability actions in marketing in food service companies.

Theoretical approach: To develop the questionnaire, we proceeded to search for scales tested in previous studies relating to sustainable food service marketing, throughout 2021 and the first semester of 2022 in scientific databases. The conceptual discussion of sustainability in food service marketing and its scales of measurement was based on studies carried out by: Lockie et al. (2002), Oglethorpe, and Nabhani (2014), Hasan (2020), Shokri, Calika and Bardudee (2016), Mani et al. (2016), Vu, Chan, Lim, and Chiu (2017), ABF Food Service Sector Study (2019), Tollin and Christensen (2019), Lučić (2020), Chowdhury and Quaddus (2021), Madeira, Medeiros, and Perez (2022).

Methods: the final version of the instrument was organized based on carrying out validation, conceptual adequacy, and clarity procedures, calculating the Hernandez-Nieto Index (Hernandez-Nieto, 2002; DeVellis, 2016), and the reliability calculation was carried out using the Cronbach's alpha. Scale validation involved two rounds of evaluation by expert judges, the first carried out by six judges and the second by 11 judges. At each round, the required modifications were incorporated into the scale until the final version was reached.

Findings: we developed a set of statements (61) to measure 10 dimensions: product; distribution; communication; price; processes; personnel; suppliers; sustainability indicators, and government. The statements that compose the questionnaire were presented in the form of affirmations, employing a 10-point Likert-type scale.

Conclusions: this study carried out the necessary procedures ranging from the literature review and the fundamental concepts to the identification and systematic evaluation of scales proposed in previous studies in terms of conceptual alignment, amplitude, and clarity. We then structured the instrument containing the scales for measuring sustainability actions in marketing in food service companies.

Practical implications: favoring the activities of managers of companies in the sector, who can use the scale to calculate the level of sustainability in the marketing, as well as promoting (or maintaining) actions that can raise (or maintain) the level of sustainability verified. Monitoring

sustainability is a demand that is periodically presented to managers, requiring a rigorously validated instrument for that verification.

Scientific implications: the creation of the scale constitutes a relevant contribution, given that the literature on sustainable actions in marketing for the food service sector lacked (or at least we could not identify) a scale that adequately measured in a combined way different dimensions of sustainability in marketing.

The role of habit for behavioral spillover in the environmental domain

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The increasingly pressing planetary crises call for immediate and fundamental behavior change (IPCC, 2018). Behavioral spillover effects present a way of initiating and accelerating voluntary, wider lifestyle change beyond the changes brought about by single interventions (Nash et al., 2019). The effect captures how and why the engagement in one pro-environmental behavior catalyzes the engagement in other pro-environmental behaviors (Nilsson et al., 2017). Spillovers can base on the activation or reinforcement of one's environmental identity, values, and goals (Thøgersen, 2014). The effect thereby depends on the similarity and difficulty of the subsequent receiving behavior (Carrico, 2021). While research provides thorough insights into mechanisms and moderators, boundary conditions regarding the effects must be better examined to understand why the effect occurs across some behaviors but not others (Höchli et al., 2019; Lanzini & Thøgersen, 2014). One boundary condition could be the habituation of behaviors, rendering them less diagnostic (Thøgersen & Crompton, 2009) and independent of intentions (Thøgersen & Møller, 2008; Verplanken, 2018), new information (Verplanken & Whitmarsh, 2021), and rewards (Wood, 2017). While the literature hints at the implications habitual behaviors can have as senders of spillovers (Cornelissen et al., 2008; Thomas & Sharp, 2013), implications on the receiving side have gained less attention. This research thus aims to systematically investigate how habits might limit the likelihood of the uptake of pro-environmental behaviors stemming from previous pro-environmental engagement. It, therefore, integrates theoretical notions from both spillover (i.e., goal theory (Dhar & Simonson, 1999)) and habit research (habit formation (Carden & Wood, 2018)). Accordingly, the uptake of new pro-environmental behaviors might require the replacement of an old environmental-consequential behavior in operation. Given that most of these behaviors, e.g., commuting by car and meat consumption, are habitual, they might be less receptive to the reinforcement of pro-environmental goals. The receptivity to new goals does, however, present a prerequisite for spillover and habit formation. To identify implications, we use a survey-based study (N=500) planned for early 2023. First, we conduct a pre-study in which about 30 potential receiving behaviors are rated according to their difficulty, social obligation, habituation, as well as, frequency and context stability. In the main study, receiving behaviors that are equally difficult and normative but distinct with regard to how habitual they typically are, are selected to rule out implications due to the former characteristics. To establish causality by design, common pro-environmental behaviors within the same life domain as receiving behaviors are selected as senders. Individuals are then asked about their goal commitment (Cornelissen et al., 2008) towards a goal shared by the sender and receiver, serving as mediator. The moderator is measured with the self-reported habit index (Orbell & Verplanken, 2015). In testing the hypothesized relationships, insights about the strength of goal commitment relative to the strength of habits on the receiving side can be gained. These can have scientific and practical relevance for designing future spillover interventions considering habituation and overcoming behavioral-lock in to foster sustainable lifestyles.

A Model of The Product User's Experience of Circular Economy Behaviors

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In a realized Circular Economy (CE), the conventional notion of a 'consumer' has evolved into a 'product user' who accesses goods through e.g., reuse and sharing (hereafter referred to as CE Behaviors). An implemented CE entails fundamental changes, both techno-economic (e.g., how products are designed and businesses operated) and socio-cultural (e.g., practices and norms around consumption) (Hobson et al., 2021; Camacho-Otero et al., 2018; Maitre-Ekern & Dalhammar, 2019; Milios, 2022). For product users, this can have both positive and negative implications; while transaction costs can be expected to increase (Hobson et al., 2021; Welch et al., 2019), CE behaviors can also bring value in the form of, for example, skill enhancement in repair (Kasser, 2009). Unfortunately, the nature of these changes is not sufficiently reflected in the scientific literature (Hobson, 2020; Welch et al., 2017) or in the policies being implemented to advance the CE (Repo et al., 2018). A comprehensive idea of what product users' experience in a realized CE entails is needed to avoid unintended consequences, support the formulation of common goals, and increase consumer acceptance of the CE transition.

To address this need, an integrative and interdisciplinary model (hereafter referred to as the product user's Experience of Circular Economy Behaviors model, or ExCEB) is introduced, based on research on consumer behavior (e.g., Jackson, 2005) and the sociology of consumption (Shove et al., 2012; Slater, 2005). The ExCEB model centers on the individual's interpretation (i.e., a cost-benefit analysis) of external CE conditions/behavior (e.g., amount of "consumer work"), an interpretation that is moderated by internal factors, such as the individual's attitudes and knowledge. In this model building, the focus is on durable consumer goods. The proposed ExCEB model is developed in three iterative stages: (1) The individual's Interpretation of the CE conditions/behavior (i.e., whether perceived as a "cost" vs. "benefit") is explored and defined using Prospect Theory (Kahneman & Tversky, 1979) and Sociology of Valuation (Vatin, 2013); (2) The associated techno-economic variables (external) are identified and explored within a multi-stage CE consumption process, e.g., the buying of a remanufactured product (acquisition stage) and reselling unwanted goods (end-of-use stage) (Camacho-Otero et al., 2020), and; (3) The associated socio-cultural variables (external) are identified, explored and incorporated as moderators to further account for how CE behavior engagement can be interpreted; e.g., one's interpretation of laborious conditions may be influenced by cultural perspectives regarding the role of leisure (Wilson, 2017).

A draft ExCEB model was presented to a group of CE behavior experts of various backgrounds for validation, additions, and modifications. The expert inputs were summarized, analyzed, and incorporated into a final version of the ExCEB model. A brief case study is used to demonstrate the ExCEB model's potential for applications and generating new insights. Also, we make recommendations for future research using the ExCEB model.

B08: Living Labs: Reflecting on the structuration of transformation; addressing impacts, replicability and scalability - Case Studies (2/4)

Session Chair: Julia Backhaus, Julien Forbat
Room: B: Omnia, R: Auditorium (max. 108)

Operationalising Food Systems Transformations within Living Labs of the Healthy Food Africa Project

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A growing number of voices are highlighting the need to change the overarching structure of food-related policies and practices. However, transforming these policies and practices to better support nutritious and healthy food systems outcomes is a complex task. The idea that knowledge should be created or collected not to merely understand the world or how people think, but to actively contribute to sustainable transformative practices in the real world is becoming increasingly important. Hence, Living Labs are often seen as test beds for these sustainable transformative processes. The Living Labs approach has been extensively used as a potential tool for co-production of problem articulation, problem analysis, the identification of solutions and their implementation. Ideally, in a Living Lab, policy-makers play a key role in the transition from knowledge creation to policy implementation.

Nevertheless, despite these unique characteristics which make living labs ideal for food system transformations, it is still unclear how living labs actually function in real-life contexts. Multi-stakeholder platforms in Living Labs have been criticised as just talk or idle chat platforms that are cut off from decision-making about important issues. Such criticism is based on concerns about the lack of political will to genuinely integrate outcomes from multi-stakeholder platforms in Living Labs into policy implementation. How to move from talk (knowledge creation) to action (policy implementation) or how to connect policy with practice in a Living Lab has not received enough attention in existing literature on sustainability transformations. Therefore, what is needed in different real-life contexts to make living labs more effective, inclusive or just from a sustainability angle? To address this knowledge gap, this study utilises experiences with Living Labs for food system transformation and innovation in 10 localities across Africa (Ethiopia, Kenya, Ghana, Zambia, Benin and Uganda) within the framework of the Horizon2020 Healthy Food Africa project.

The key finding is the need for Living Labs to create shared visions between citizens and policy-makers at an early stage in the co-creation process. This will merge top-down policy actors with bottom-up understandings and approaches. This finding contributes to enhancing the capabilities of Living Labs in making meaningful contributions to healthy and sustainable food system transformations. It provides greater clarity on processes that address imperatives and mobilise the drivers of effective place-based governance for sustainability in Living Labs.

Living Labs as a tool for reconfiguration of governance model in food systems

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During the recent decade, Living Lab (LL) approaches have been widely used for studying and stimulating social innovations in food systems. Such approaches usually address so called wicked problems, i.e. those encapsulating multiple levels, sectors and aspects of social life. Many food system challenges currently relate to economic, political, environmental and health issues. Hence, Living Lab approach, being transdisciplinary, multi-actor and experimental, seems to provide adequate working model to grasp wicked problems.

Based on research conducted in the FOODIVERSE project ("Diversifying sustainable and organic food systems") we argue that the transformational potential of LL arises from a new governance of innovation processes. By engaging diverse food system stakeholders and redefining the role of food consumers towards food citizens, LLs afford a more inclusive approach including more democratic decisionmaking processes. On the one hand, LLs lead to fundamental change in the way food policies, strategies and public interventions are developed and implemented. On the other, LLs can help scaling up the innovations already being developed and practiced on the food system's margins: in Alternative Food Networks, social movements, NGOs, local communities, food activist etc.

In this paper we will discuss and compare three LL examples that we have established in frame of the FOODIVERSE project in Krakow (with the Wawelska Food Cooperative), in Gießen (with the local Food Policy Council) and in Trento (with the Nutrire Trento project). For all three LLs we collaborate with existing initiatives. We discuss how LLs can serve as a bridge between various levels and sectors of food system. We also identify challenges and failures of the LivingLab-isation process. We will discuss how this approach can stimulate new solutions, new models of collaboration, and new transformation pathways. However, we also identify the limitations and risks of LL model, for instance, despite aiming at more participatory approaches fail at integrating social justice. LL approaches seem to be particularly relevant in those sectors, where problem-solving practices are fragmented, interventions are disintegrated, and actors' interests and goals are highly specialized. We provide FOODIVERSE experience here as well.

Berlin's pathway to carbon-neutrality

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The city of Berlin wants to achieve carbon-neutrality until 2045 and provides due to its diversity of life styles an ecosystem for innovative living lab research. The Potsdam-Institute for Climate Impact Research (PIK) has set up a series of projects and experiments to work co-creatively with local stakeholders on sustainable development in a living lab design.

In 2018 the project 'KLIB' started– a one-year experiment during which 100 Berlin households from different social milieus have worked on lowering their CO₂-emissions by 40%. Participating households have tried out various interventions to lower their carbon footprint and reviewed sustainable measures from the perspective of consumers and citizens. The results of this experiment showed that living and consuming climate-friendly in a collective manner is feasible. Building on these results PIK has implemented a second project together with GenderCC and BürgerEnergie Berlin dealing with diverse participation in the energy transition. BürgerEnergie Berlin as a bottom-up player for the local energy transition is fighting for years for a better participation of citizens in the energy transition by demanding the repurchase of the Berlin energy grid. The focus of our research is the implementation of measures to reach out to social groups that were underrepresented in KLIB and in the energy transition in general. By cooperating with local experts from different social communities we are implementing measures to increase diverse civic participation in the energy transition. In our research we have gained insight into struggles for a more diverse and open energy transition.

Both living labs project allowed us to gain insights into citizen engagement in sustainable energy production and consumption. In our paper we will first of all present core findings of our research and the implementation of the mentioned interventions. Moreover, drawing on this research we have identified factors hindering and motivation action for sustainable action on an individual level. Finally, we address implication for the living labs research in regards of diverse participation, justice and power struggles from our projects.

Living Lab Veen-Vitaal: Co-creating integrated socio-ecological measures of land management to realise sustainable production and consumption of public goods.

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VeenVitaal is a Living Lab that aims to improve biodiversity and ecosystem health of lowland peat landscapes. It recently started out as a five year NWA-funded project with over 30 consortium members and aims to embed transformative change in farming practice and consumer behaviour. The Vrije Universiteit coordinates the Living Lab within which ecological, social and economic research is co-created and conducted with consortium members around the city of Amsterdam.

The project aims to develop improved landscape quality indicators and new socio-economic business models that encourage nature-inclusive land use with positive effects on biodiversity, ecosystem health and ecosystem services. In this regard VeenVitaal aims to address and assess the viability of a broad concept of production and consumption, where farmers in low land peat meadows produce a number of ecosystem services beyond just food that benefit the local population and society at large, such as climate change adaptation, regulation of water quality, mitigation of greenhouse gas emissions, cultural heritage and recreation.

A major challenge herein is how to measure production and consumption of immaterial goods and services (and disservices). Not only do we need to include their demand and supply, but also potential synergies and trade-offs between ecosystem services, while ensuring they are integrated appropriately into new socio-economic business models and landscape quality indicators. These goods and services are difficult to measure and therefore require intensive co-creation and co-design across social, economic and ecological research and professional domains. In this presentation we share our learning curve of developing our transdisciplinary approach to address this complex problem.

Agri-food living lab with action research for strengthening production and consumption of organic vegetables

Christine Hvitsand, Telemark Research Institute

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Agri-food systems and beyond are complex, but still knowledge and decision-making are specialized and fragmented. Despite knowledge about what characterize sustainable agri-food systems, mechanisms are locking in the current situation and preventing change. There is a need for insight into how change can take place, taking systemic, cross-sectoral, whole supply chain and multi-actor approaches to transitions. A more active researcher role in collaboration with societal actors could contribute to understanding how to accelerate changes based on scientific and practical knowledge. Furthermore, there is a need for more knowledge about the role of action research to facilitate and experimenting with change processes.

The aim of the paper is to show how a researcher-facilitated agri-food living lab with the purpose of strengthening organic vegetable agri-food systems, unfolded. The research shows the entire innovation process from bounding the system of interest, the procedure for selecting and inviting participants, problem diagnosis, visioning, generating ideas, planning actions for the main idea and piloting – focusing on the connection between and milestones in these steps, prerequisites, as well as the role of the researcher and the participants.

The study applies systems thinking to understand the complexity of the situation for organic vegetables in the region. The study links theories of action research and urban living labs as open innovation platforms to structure participatory and co-creative learning and action processes. Furthermore, the multi-level perspective was applied to understand the emergence of the lab and innovation as niche-activities.

The action research and living lab was situated in the Vestfold region in Norway with the County Governor's agricultural department as collaborative partner. The overall process consisted of three steps: introductory work, agri-food living lab activities, and piloting a co-created innovation (e.i., the action output). Methods of data collection were interviews (introductory and by the end of piloting), dialogue processes in 11 workshops, participants evaluations, reflections on observations by researcher and practical coordinator of the piloting.

The structured and connected processual activities enabled the emergence of new networks, collective learning and action across sectors and actor types. The diverse group of change-oriented participants, including such individuals within regime entities, development of a common problem understanding and a shared vision. This enabled to identify areas of action, generate ideas within these and a decision to start an alternative and local food system, named Green Parallel, which linked organic vegetable producers with professional buyers such as specialty stores, restaurants and public entities through (reasonable) transportation by a work inclusion and training entity. The research identifies important connections, prerequisites and milestones in the processes.

With the purpose of enhancing sustainability in production-consumption systems, the action research and living lab processes enabled to link change-oriented actors within and beyond the agri-food domain with mutual benefit of collaborating. The initiative can be replicated, with contextual adjustments, within similar or other topics, based on the processual design and researcher role. The research contributes to knowledge about significant prerequisites and milestones when working with change processes, which could be valuable in planning and conduct of other change initiatives.

B09: Edurruption: The disruptive potential of education for transforming consumerism - Engineering/Management Education (2/3)

Session Chair: Ulf Schrader

Room: B: Omnia, R: Momentum 1 (max. 30)

A Broad Framework to bring Sustainability and Ecological Consciousness in Civil Engineering through Environmental Ethics and Social Ethics

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This project primarily focuses on bringing knowledge and creating a broad framework to introduce sustainability and ecological consciousness in civil engineering through the implementation of environmental ethics and social ethics. The research that has been done in this project focuses on the necessity, methods, ways and implementation of sustainability and ecological consciousness into the civil engineering curriculum. It involves the study of researchers from various countries who try to summarise the concepts of sustainability in the civil engineering field and have developed a module or a course that introduces it to the different levels of civil engineering students in a particular University who evaluated the progress of understanding sustainability and then use its concepts in their work or projects. This research touches on an understanding of ecological consciousness and how to apply that knowledge in civil engineering education. The research also incorporates the analysis of the case studies to see the primarily focused areas in the current system of civil engineering curriculum and how a new perspective can be built through the lens of ecological consciousness with the implementation of socially and environmentally ethical concepts in the existing one. Based on the research, surveys conducted and new knowledge built in the direction of this line of enquiry, a broad framework as a proposal outcome is designed for civil engineering education to see the world with more than interrelationship-centric approaches.

A Skeptic's Guide to Environmental Claims: Curriculum and Investigation Results

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Acknowledgement of the rebound effect is now widespread in the scholarly discussion on technology and its role in delivering environmental impact reductions. Many technological concepts typically associated with sustainability are coming under scrutiny as it becomes clear that their popularity is linked to unit cost-savings, putting them at risk of rebound. This phenomenon is well-known when it comes to transportation efficiencies, but recent studies are uncovering the same risk of rebound in sharing-economy and circular-economy systems. Macroeconomic feedback effects are now a central theme of environmental sustainability. They are no longer simply analytical techniques, and the rebound effect is not a paradox. As such, macroeconomic feedback perspectives, effects, and measurement should be introduced in academic courses across environmental disciplines.

In this paper, I will present my experience developing a graduate-level curriculum on feedback effects for an engineering department; what I call “A Skeptic’s Guide to Environmental Claims.” And I will report on student experience and learning outcomes, based on the students’ final report findings and course feedback survey responses. The curriculum follows three phases: 1) A history of technological efficiency and environmental outcomes, 2) economic feedback terminology and mechanisms, and 3) evaluating environmental impact studies for inclusion/exclusion of feedbacks, i.e. developing a skeptic’s eye for environmental claims. I delivered this curriculum over ten class sessions, with assigned readings ranging over a wide range of time periods (1700s to present) and disciplines (history, political science, economics, and engineering). For their final report, students conducted a systematic review of environmental claims about a technological “solution” of their choice. They systematically evaluated the methods and assumptions underlying these claims and asked whether any kind of economic feedback – direct or indirect, financial or sociological – was considered. Not surprisingly, nearly all students found that feedbacks were ignored in both scholarly and corporate environmental assessments.

More surprisingly, students were not discouraged by these results. Many students reported that it was their first time encountering the idea of rebound and feedbacks, and that this was in fact an empowering and enlightening aspect of the course. Students generally enjoyed the historical perspectives they gained, especially through our visit to the Purdue University Archives to inspect original lab notes and manuscripts by Frank and Lillian Gilbreth, two early proponents of the “scientific management” approach to industrial production. This experience brought to life the reality that technological efficiency is nothing new and has traditionally been pursued for financial gain over social or environmental outcomes.

The student experience and their investigation findings both point to the promise and importance of including economic feedback effects in sustainability curricula, no matter the discipline. I show that this can be empowering for students, by preparing them for the economic realities that technological solutions face at scale. I also show that this does not have to be a purely analytical topic. It can be a fun historical journey and is guaranteed to stimulate lively and productive discussion about realistic solutions.

Sustainability Integration in Business and Marketing Education: A Literature Review

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Modern societies have been dealing with economic, social and environmental declining baselines, leading to global concerns for sustainable development. In 2005, United Nations Educational, Scientific and Cultural Organization (UNESCO) promoted sustainability-focused education to develop citizens who can build a just and sustainable society (UNESCO, 2017). Hence, sustainability education has gained significant recognition in higher education institutions around the world. In higher education, business schools train future business leaders who will get involved in operating the business sector which in turn produces economic, social and environmental impacts. Particularly, marketing is one stream of business education that prepares students for the education of sustainable consumption as well as for the promotion of sustainable products and services. A debate is going on about how business schools should teach sustainability, given the dominant industrial worldview in business and marketing disciplines (Toubiana, 2014). University academics play a vital role in developing competencies of sustainability for graduates (Beusch, 2014). Therefore, integrating sustainability in business and marketing education needs commitment from academics whose perceptions and practices affect educational outcomes to a large extent. However, sustainability is not evident in the marketing curriculum and research (Kemper et al, 2020).

To set a theoretical direction for future studies on sustainability integration in business and marketing education, we conduct a systematic literature review to identify the main themes and research gaps. The key terms used to undertake the literature review search for relevant studies on the Scopus database, ERIC database (Education Resources Information Center) and Google Scholar are: “sustainability, sustainability education, sustainability in business education, sustainability in marketing education, teachers’ perceptions of sustainability, marketing academics’ perceptions towards sustainability, faculty view on sustainability, sustainability integration in higher education, sustainability integration in marketing education, sustainability teaching in marketing courses, sustainability marketing, sustainability in marketing, sustainability in marketing education, sustainability in business schools, sustainability integration in business education, and sustainability teaching in business courses”. The review scope captures recent studies within the past ten years, with a few exceptions beyond the ten years’ timeframe to provide important historical background.

First, the background on sustainability, sustainability education and business education for sustainability is provided. Second, an overview of academics’ roles in higher education for sustainability is discussed to shine a light on their change agent roles. Third, with a focus on business education and the marketing discipline, prior research on academics’ perceptions of sustainability is examined in two aspects: the worldviews of business academics in general, and marketing academics’ perceptions of sustainability specifically. Fourth, studies on teaching practices of sustainability integration in higher education and particularly in the business and marketing discipline are reviewed. Fifth, a review of the literature concerning sustainability competencies to be developed for business and marketing students is given.

The analysis captures the major research themes and identifies research gaps with regard to business and marketing academics’ perceptions and practices of sustainability integration. The conclusion provides a plethora of opportunities for future research to explore various attributes of effective sustainability integration in business and marketing education.

Circular Economy in children's education – Case Study: Borna Environmental Education Institute

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The circular economy is one of the most effective models to deal with global environmental problems. Adding environmental awareness to the educational system has been done in many countries in recent decades; however, there is a wide gap between the input and its impacts on the students. Since learning is a gradual and long-term process and starts from an early age, educational systems need to adapt themselves to a more environmental-friendly approach. The current research investigates the impacts of a learning approach based on circular economy and sustainability on children in a daycare centre in the city of Karaj, Iran. The purpose of this narrow-scope case study is to use the findings as the basis for future studies.

Borna Environmental Education Institute is a daycare centre run by Borna Naturalists organisation, and an environmentalist NGO focused on environmental education. They use humanistic learning theory which expects educators to act as facilitators and observers rather than teachers in order to encourage creativity instead of goal-based approaches. The circular economy is one of the pillars of this institute and they achieved and are willing to expand their curriculum to more environmental high satisfaction from parents' learning.

Semi-structured interviews were conducted in the daycare centre to investigate the staff members' professional views on implementing a circular economy in their work. Furthermore, a questionnaire was distributed amongst parents in order to gain more knowledge about the impacts of the ongoing learning methods on their children. By using on different groups, the researchers were able to elicit two inquiry approaches more information about the advantages and disadvantages of a circular economy-based education. This indeed improved the data analysis in order to pave the way for future studies.

The study found that most facilitators and staff members had profound knowledge about the circular economy and could evaluate the learning approach and its impacts on pupils. They also raised the importance of implementing CE at all educational levels. Since the circular economy is not in the government educational curriculum, the facilitators were also concerned about the costs of private institutes which led to excluding workingclass children from learning about it. Parents' satisfaction was another result of this study showing how this learning method can influence children in long term. In the end, all individuals emphasised the necessity of incorporating circular economy and sustainability into the educational system from the beginning.

This was a pilot case study in an educational institute pioneered in teaching children about environmental issues from an early age. The daycare centre is run by an environmental NGO that also organises workshops about the circular economy, environment, nature and sustainability for both educators and students. Further research is needed to study all aspects of educating children about the subjects and the age-specific curriculum.

Smart Education for Corporate Sustainability Reporting

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The EU launched an ambitious initiative “The European Green Deal” (EGD) as an integral part of the EU Commission’s strategy to implement the United Nations 2030 Agenda & the sustainable development goals. Reliable, comparable, and verifiable information plays an important part in enabling consumers to make more sustainable decisions and reduces the risk of ‘greenwashing’. As part of EGD initiatives, companies will be required to report against a standard methodology and assess their impact on the environment. In current practice, the Non-financial Reporting Directive (NFRD) lays down the rules on disclosure information by companies and is fully transposed in all EU Member States (including partners’ countries). However, the reporting obligation applies only to companies with over 500 employees. Analyses reveal that in many cases, information is provided at a general level, and/or data are incomplete and non-comparable. The EU Council and EU Parliament reached an agreement on June 2022 to replace the NFRD with the Corporate Social Reporting Directive (CSRD) that extends its scope to all companies over 250 employees and certain SMEs, which will be required to report on non-financial aspects of their business since 2024–2028 (depending on the size of a company). The number of companies subject to mandatory reporting will thus increase from 11 700 to approximately 50 000. The managers and responsible employees will have to cope with new challenges. The project Smart Education for Corporate Sustainability Reporting (SECuRe) is filling a gap in VET programmes dealing with knowledge in sustainability strategic approach and reporting and building up a common approach for VET teachers and learners across the EU to respond to the requirements of the future and flexible job market:

- Develop partnerships amongst educators, businesses and other stakeholders aimed at promoting work-based learning in all its forms and supporting VET learners in acquiring and developing skills and key competencies in sustainability reporting and fostering employability.
- Introduce open education and innovative digital practices making education available for all and facilitating new learning methods by developing a new e-Learning platform.
- Facilitate the recognition and validation of competencies for the SECuRe Manager job, covering the needs of companies through the creation of an innovative VET course.
- Implement/test during short-term training and demo training the learning content and learning materials developed.

The consortium started with the Knowledge Repository and a questionnaire to 80 potential corporations, learners, and teachers to find their needs and wishes. Manager job profile and training course contents were prepared for 6 learning units with 5 ECTS units each: 1) European legislation and sustainability standards, 2) Sustainability management, 3–5) Environmental, social, and corporate dimensions, and 6) Sustainability reporting. An interactive e-learning platform and a pilot application of the course are being developed. An interactive e-learning platform with a gamification approach, multiplier events, and experimental online training together with other learning, teaching, and training activities will bring the final contents of the course.

B10: Attuning environmental impact aspects with the PAS compass

Session Chair: Reino Veenstra

Room: B: Omnia, R: Spectrum (max. 30)

By now we are all aware that lowering the humanmade impact on nature requires regard for every aspect of humans' interaction with the natural environment. Decisively reducing that impact is a complex endeavour that ties aspects as political decision, human activities, and product systems together. Product systems take a central role in all this, since the major part of human's environmental impact derives from products and their corresponding product systems. These systems' environmental impact gets generated throughout a product's lifetime: from before production 'upstream' unto waste processing 'downstream', and in every phase of use. The best place to intervene is during design. This is because in that process all product aspects can be redefined. Even the way in which a personal need or product function is fulfilled can be redesigned, making it possible to radically reduce or replace an environmental impact aspect. Environmental impact minimisation depends on environmental product optimisation (EPO), as it requires continuous attunement between interdependent product aspects. Among these product aspects are the potential future customer decisions and consumer behaviour that derive from the physical product characteristics that are selected during design. This intricate attunement demands interdisciplinary collaboration and optimisation demands that each team member contributes domain specific environmental considerations. Given the complexity of the task at hand, tools that bridge the gap between domains are indispensable. During the SCP session, the participants will be presented a product aspects systemisation (PAS), named the PAS compass. This model provides an overview of all aspects that contribute to a product's environmental impact and positions the actors that can intervene. During a workshop, the PAS canvas will be used. This underlay, developed to support interdisciplinary collaboration, will form the core of the session. With it, we hope to support you acknowledge and connect impact concerns in a way you have not managed before.

B11: Are national consumption-based climate targets a good way forward?

Session Chair: Jörgen Larsson

Room: B: Omnia, R: Momentum 3 (max. 30)

Consumption-based accounting of the carbon footprint related to products, lifestyles and nations have been researched for a long time. Recently a Swedish Cross-Party parliamentary committee took this one step further and uniformly suggested consumption-based climate targets. This session will explore various aspects of such targets: how is the Swedish target proposal constructed; how can it be monitored and are the monitoring methods accurate enough; which target levels are realistic; how do the consumption based target levels relate to targets on territorial emissions; is the policy toolbox sufficiently powerful and effective?

Line-up of speakers:

1 - Introduction - interview with Emma Nohrén

Chair of the Swedish Cross-Party parliamentary committee on environmental objectives during the investigation on consumption-based climate targets.

2 - Creating a context for 1.5-degree lifestyles

Lewis Akenji, Managing director of the Hot or Cool Institute

3 - Is the methodology for calculating consumption-based emissions good enough for monitoring a target? (10 min)

Edgar Hertwich, professor at NTNU, Norway

4 - Scenario analysis of consumption-based emissions for Sweden - what changes are needed for reaching 1 tonne/capita by 2050?

Johannes Morfeldt, researcher at Chalmers University of Technology, Sweden

5 - Potential policy instruments for reducing consumption-based emissions

Jörgen Larsson, associate professor at Chalmers University of Technology, Sweden

B12: 'Reconceptualising sustainable lifestyles by learning from the environmental knowledges and practices of Global South immigrants to Global North cities'.

Session Chair: Sherilyn McGregor

Room: B: Omnia, R: Momentum 2 (max. 30)

Between 2000 and 2017, the proportion of the global population living outside of their country of origin rose from 2.8% to 3.4% (UNDESA, 2017). Analyses of the intersecting challenges of environmental degradation and immigration have tended to focus on causes rather than consequences, recognising climate change as a driver of migration. Significantly less attention has been given to the cultural dimensions of environmental problems and policy solutions at a time when many 'countries are becoming more heterogeneous. This knowledge gap is problematic not only because the success of sustainability agendas depends on maximum societal uptake, but also because misalignment of cultural norms and practices may contribute to a lack of social justice in diverse cities seeking to be more inclusive.

A small body of research has found that individuals who have migrated from low income contexts show a higher disposition towards 'sustainable' practices such as reducing household waste (Bradley, 2009; MacGregor et al., 2019), using water sparingly (Maller, Strengers, 2012), and walking or cycling (Waitt et al., 2016). Scholars have argued that immigrant knowledges present a valuable resource for sustainability and climate change adaptation (Head et al., 2018). This session calls for researchers to share insights and evidence that progress and/or problematise understandings of sustainable lifestyles through research conducted with and/or by im/migrants to Global North cities. We aim to network with scholars who have experience of participatory research that centres contributions (actual or possible) made by immigrants and their families, as well as wider diasporic communities, from the Global South to the sustainability agendas in the places they have settled.

This session is relevant because it focuses on the practices and motivations of a specific type of consumers who have not been the subject of much research to date. The session speaks to a number of conference themes, all with the overarching concern to ensure SCP research is inclusive of marginalised perspectives. Transition cannot be 'just' unless it is inclusive. There is a good fit with the following conference themes:

- Drivers of change [...]: from international to local to cross-cultural perspectives
- Discourses [...] for strong sustainable consumption
- SCP in urban contexts.

Our topic aligns with a 'critical sustainable consumption' approach that foregrounds both critical theory and environmental justice as a social movement. The focus on how migration experiences and the knowledge and practices that move with people when they migrate will serve to fill a significant gap in SCP research. Gathering together researchers working on these themes with such communities will be an important part of the session.

Line-up of speakers: Sherilyn MacGregor, University of Manchester,
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Tally Katz-Gerro, University of Haifa, tkatz@soc.haifa.ac.il (in person)

Zarina Ahmad, University of Manchester zarina.ahmad@postgrad.manchester.ac.uk (in person)

B12: 'Reconceptualising sustainable lifestyles by learning from the environmental knowledges and practices of Global South immigrants to Global North cities'.

Discussant: Manisha Anantharaman, St. Mary's College, ma20@stmarys-ca.edu (online)

C: Thursday, July 6, 15.30-16.45

C01: Durability and Repair in Consumption and Production

Session Chair: Maïke Gossen

Room: B: Omnia, R: Momentum 3 (max. 30)

Producers or consumers: Who opts for longer lasting quality products?

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Context: Producers and consumers are two of the primary market stakeholders and both will play integral parts in the transformation towards more circular markets with longer lasting products. Together they can be agents for incorporating longevity if they believe in the principles of circularity and take decisions in their work and personal life accordingly. Product lifespan is a characteristic of product quality. Consumers want producers to interpret their perceived needs and shape them into products and producers want consumers to trust their judgements about products. The aim of this paper is to compare the attitudes of producers and consumers towards product quality.

Method: Semi-structured interviews were conducted with forty managers in the UK from three industries: clothing, household appliances and transport. Managers were required to discuss the process through which product quality is incorporated in companies. Another section of the interview enquired about their buying behaviour. In this section, participants were requested not to answer from the perspective of their potential consumer base but instead, as individual consumers, outside of their work and specialisation domains. While playing both roles, as managers and consumers, they were asked if they had a minimum quality level that they settle for. The question in the two settings were:

First, as a producer, if there was a minimum quality level that managers assume they need to commit to?

Second, as a consumer, if there was a minimum quality level that they felt satisfied with?

Thematic analysis was conducted using NVivo. Recurring words and phrases were identified for responses from both questions and compared for similarities and differences.

Results: The findings showed that managers assumed that aesthetics would be a high priority for consumers, but as consumers, they did not mention aesthetics as a minimum quality criterion. Managers conveyed that aesthetics would be high on priority for consumers, but as consumers did not mention aesthetics as their minimum quality criteria for buying. Both managers and consumers looked for the performance criterion, that the product must be fit for

purpose. Guarantees were not mentioned by either as a minimum quality criterion. Overall, while managers had the know-how of product quality and could adapt it, as consumers could only use experience to judge quality, even when experts in the same industry. While as managers, they could decide the performance levels, as consumers, they had to guess these from various cues such as price, touch and feel, customer reviews and past experience. While as managers, they did not mention basic service quality, as consumers, they judged brands from their services and experience at touch points, both before and after purchase.

The results have implications for the product lifespan narratives. As consumers, managers assumed durability in products, especially for expensive purchases but as managers, they equated minimum quality level with legal product specifications and rate of returns (which relates to reliability) and did not mention quality in terms of durability.

Scaling grassroots initiatives with local authorities

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In cities across the world, grassroots groups organize to arrange alternative forms of provisioning in fields as energy, transport, food and consumer goods. Examples are energy cooperatives, the making of car free spaces, food sharing networks or repair cafés. Several local authorities recognize the potential of grassroots initiatives (GIs) to spearhead and provide civic engagement for sustainability transitions. Voytenko-Palgan et al (2021) have pointed to a set of different governing roles local authorities can take vis-a-vi sharing economy initiatives, acting as regulator, provider, enabler, consumer and collaborator. Based on studies of grassroots food initiatives, Laforge et al (2017) have conceptualized relations between governments and GIs in terms of containing, coopting, collaborating and contesting.

In this paper we build on this literature and explore the relationships between local authorities and grassroots initiatives in the fields of energy and food provisioning, cycling and repair, in the geographical contexts of Berlin and Gothenburg. More specifically we ask: what roles do local authorities envision GIs to play in sustainability transitions and how do they relate to them? And what do the GIs see as their role vis-a-vi local authorities?

Berlin and Gothenburg with their surroundings have been chosen since they constitute vivid scenes for grassroots initiatives and are hotbeds for the movements around food sharing and community repair. The empirical material is based on interviews with representatives from grassroots initiatives as well as local authorities, conducted during 2021 and 2022.

Our results show different forms of relationships: partnerships between GIs and local authorities, local authorities containing GIs, supporting GIs through funding or fronting them on public maps etc, or local authorities, copying and managing operations similar to GIs. The paper specifically highlights cases in Gothenburg and Berlin where local authorities take on a more active ownership role, that is replicate GIs, upscale and manage the operations – sometimes in collaboration with GIs and sometimes on their own. This can be in the form of municipally managed repair spaces, reuse shops or temporary “play streets”.

The contribution of the paper lies in a deeper understanding of how grassroots initiatives and local authorities relate to and use each other, specifically pointing to an emerging ownership role for local authorities. Such a role implies rethinking the very idea of what municipal infrastructure should encompass. Learning from GIs, municipal responsibilities may not only include the traditional infrastructures for transport, energy, water and recycling but also infrastructure for repairing, reusing and sharing food and other amenities.

References

Laforge, J. M. L., Anderson, C. R., & McLachlan, S. M. (2017). Governments, grassroots, and the struggle for local food systems: containing, coopting, contesting and collaborating.

Agriculture and human values, 34(3), 663-681.

Palgan, Y. V., Mont, O., & Sulkakoski, S. (2021). Governing the sharing economy: Towards a comprehensive analytical framework of municipal governance. Cities, 108, 102994.

The recirculation of textiles: Why volunteers matter

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Thrift plays a vital role within a circular economy. As clothing and textiles are recirculated locally, their reuse has many environmental, social and economic benefits. Within Canada, used clothing and textiles collection is predominantly carried out by charities to generate funds to carry out charitable activities or by for-profit organizations. Clothing (including footwear and accessories) comprises approximately 36% of revenue generated by used good stores, more than any other product segment (Koronios, 2021), demonstrating the vital role of clothing within the second-hand economy.

Volunteers increase the capacity of a charitable organization to achieve its mission. They dedicate their time, expertise and labour, toward the mutual benefit of the organization, ultimately serving as its backbone. In Canada, volunteering is an essential component of Canadians' civic duty. Yet, the volunteering landscape has been changing with the number of volunteer hours slowly declining over the years in many different areas. This decline has been attributed to an aging population, and the pressures of the 'sandwich' generation where family, work and caring for older relatives has impacted the availability of middle-aged individuals to devote time to volunteering (Volunteer Canada, 2017). This changing landscape of volunteers is strongly evident in the changes experienced by charitable organizations that deal in second-hand textiles.

The goal of this research was to explore the role of volunteers across multiple stores of one large Canadian charitable thrift organization, with the specific purpose to determine how volunteers impact the life of textiles and potential for resale locally. Various tasks and attributes were identified to describe how their roles impact the flow and utilization of textiles within local stores. Semi-structured interviews were conducted with store managers and volunteers at six thrift store locations. The thrift stores were located in both rural and urban communities, across two Western Canadian provinces.

Results focus on the changing demographics, number of volunteer hours and longevity of the volunteer-store relationship. The resource-rich skills of many older volunteers, predominantly women, with long-standing relationships with their community thrift stores have led to changes in expectations surrounding volunteer's tasks, training and role of employed staff within thrift.

Volunteers' offer unique skills and expertise setting some stores apart from others in their upcycling capacity of textiles (e.g., making denim blankets or quilts). The influence of volunteers, particularly in how donations can be repaired also distinguishes some stores apart from others, and this impacts the potential for reuse of items that might otherwise be destined for landfill. All stores experience huge volumes of textile donations on a daily basis. Their volunteer pool, including number of hours volunteers are available, their abilities and reliability can impact the day-to-day management of the material throughput from receiving, to sorting and to the sale floor. Implications of volunteers in light of the essential function thrift has in a clothing and textiles circular economy will be discussed.

References:

Koronios, E. (2021). Canada Industry (NAICS) Report 45331 CA.

Volunteer Canada (2017). Canadian code for volunteer involvement.

A roadmap to promote repairing in Austria to support a circular economy

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If the goal of net-zero emissions should be achieved, in particular CO₂-emissions caused indirectly along the value chain of products need to be substantially reduced [1]. Investments in product lifecycle extension services are needed and end-of-life management to close the loop of material flows [2]. In the study „PREPARE4Repair“, successful approaches to promote repairing products from all over Europe were collected from experts with questionnaires and interviews [3]. The successful approaches are: increasing emotional attachment to products, reducing the cost of repair, channelling revenues from extended producer responsibility schemes to support repairing activities, providing easy access to repair services, making repaired „preloved“ products easily available to the interested, linking repair centers to waste management centers. The findings were discussed with Austrian experts in focus group discussions to extract transferable elements from the collected case studies. The full paper will describe the combination of these elements into a roadmap to support the Austrian circular economy strategy.

References:

[1] Europäische Kommission, EU Science Hub: <https://ec.europa.eu/jrc/en/research-topic/sustainable-product-policy>, accessed January 2023

[2] Capgemini Research Institute, Rethink: Why sustainable product design is the need of the hour“, 2022

[3] Wohlgemut S., Fresner, J., and Schnitzer, H., „PREPARE4Repair“, Progress report, Bundesministerium für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie, 2022

Creating inclusive and diverse participation in a neighbourhood repair workshop - Results of a co-creation process in a living lab context

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Presenter: Alexandra Kessler, alexandra.kessler@cscp.org (in person)

Socially innovative practices of sustainable prosumption in an urban context are widely credited with being a promising approach in sustainability transformation, both environmentally and socially. Analyses show that even for initiatives working on a non-profit basis (e.g. food sharing, community gardens), the external and self-attribution of contributing to transformations does not apply without restrictions. Rather, they bear the risk of reproducing social inequalities, especially social exclusion. However, locally operating, non-profit organisations that enable interaction offer great potential to fulfil expectations of transformation potential, especially with regard to social sustainability, such as cohesion and inclusion.

This contribution presents the results of a qualitative study of sharing practices of a civil society initiative in a heterogeneous neighbourhood of a German city, which tends to be more challenged than other neighborhoods in terms of unemployment and poverty and shows a high level of cultural diversity. In the context of an interdisciplinary co-creation, an open neighbourhood workshop for repairing and building was piloted with the aim of reaching people who had not previously come into contact with the initiative's activities and who represent the diversity of the neighbourhood. From a scientific perspective, the emergence of (especially bridging) social capital was analysed, based on a praxeological analysis of the activities of the neighbourhood initiative. First results show that (1) a general openness of the activists and activities for all people and also (2) an awareness of the challenge to reach marginalised groups are not sufficient to ensure inclusive participation. Rather, it requires both (3) skills to reach out and engage people in practices and (4) reflection to adapt practices to better enable inclusion of new people.

C02: Sustainable food in public institutions and canteens

Session Chair: Arnout Fischer

Room: B: Omnia, R: Quantum 1 (max. 30)

School Meals as a Local Policy Tool for a Transition to Sustainable Diets: A Mixed-Method Study of Pupil Acceptance

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The global food system is responsible for a quarter of all anthropogenic greenhouse gas emissions and IPCC points to dietary change as a major opportunity to reduce these emissions. In Sweden school meals constitute a viable opportunity for interventions on a local level to promote such dietary changes, since all pupils in the compulsory school program are served free school meals. Thus, Swedish municipalities frequently include targets and measures aimed at school meals in their plans to reduce the municipality's greenhouse gas emissions.

However, altogether public meals constitute 3-4% of total food consumption in Sweden.

Therefore, the greatest potential of school meal programs may lie in getting the school children used to climate-friendly, healthy diets, by serving this for over a decade of their lives, at an age when they are shaping their food habits.

This study examines how local authorities may use school meals as a policy tool to encourage the adoption of climate-friendly diets. The aim of the study is to investigate (1) whether a change to a new menu with a reduced climate footprint affects Swedish elementary school pupils' acceptance of the school meals, and (2) whether information about the menu change affects the pupils' acceptance of the school meals.

In the intervention part, the school lunch menu was changed to reduce greenhouse gas emissions by 20%, using a method that has previously been tested with good acceptance in Swedish elementary schools (Elinder et al., 2020; Eustachio Colombo et al., 2020). These studies did not include any information to the pupils regarding the menu change. The effect of information is interesting because authorities would likely want to communicate such climate policies. However, that could also trigger a negative reaction. Therefore, the aim of this study was to assess the pupils' acceptance of the new menu, with and without information about the change. Six elementary schools were divided into two treatment groups and one control group. During a seven-week intervention period, the pupils were served a changed menu in relation to the baseline period. In one of the treatment groups, the pupils were saliently informed about the menu change through an educational video in class. The acceptance of the menus was assessed by weight measurements of food taken and plate waste, and by questionnaires. The results from the questionnaires showed no significant effects of the menu change or the information. The weight analysis of food taken and plate waste is ongoing.

In the qualitative part, civil servants responsible for school meal planning at 11 Swedish municipalities were interviewed. The sample was selected among the municipalities with the lowest climate footprint, from a database with the climate footprint of public meals of 186 of Sweden's 290 municipalities. The analysis of the data is ongoing, focusing on measures to

reduce the climate intensity of the menus, reduce food waste, increase acceptance of these measures, and organizational measures to support the other measures.

School food procurement as a lever for more sustainable agricultures : analysing two local public programs in Montpellier area, South of France.

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For several years, French public actors have been implementing various strategies to promote the introduction of sustainable food in public procurement. This presentation focuses on the implementation of these strategies as a lever to contribute to the transition towards more sustainable agricultures.

In the wake of the debate on the relations between public food procurement (PFP) and sustainability transition, we analyse two programs in the South of France carried out by public actors : the City of Montpellier and Agglomération du Pays de l'Or. Both initiatives are part of the same region and refer to the same agricultural production area, yet they use different instruments to support organic and local food producers. The first one mobilises contract lotting and the use of specific evaluation criteria, targeting individual producers. The second one structures a midscale food chain in the area by supporting the creation of a farmers organisation and establishing a calendar based on products seasonality compatible with the demand of public canteens. Drawing on Actor-Network theory (Akrich et al. 2008, Callon 1986) and relying on qualitative data collected through semi-structured interviews, we first analyse the types of actors enrolled in the governance of PFP and their translations of sustainable agriculture. This will contribute to explain the choice of instruments implemented and the types of producers targeted by the public actor. Then, we study the effects of actions resulting from these translations, analysing changes of practices and representations of the producers involved.

Results show that, in Montpellier, most influential actors within the program belong mostly to conventional agriculture organisations and have a conception of sustainability linked to the promotion of local agriculture. Farmers and processors who are thus approached to sell in PFP only partially break with dominant production practices from an ecological and social perspective. In Pays de l'Or, actors included in the PFP governance are only those in favour of organic agriculture, as the public actor is more widely committed to supporting organic agriculture on its territory.

As for the 2nd research question, producers sustainable practices depend more on their individual trajectory than on the PFP program, which represents only a modest part of their income. However, the contractual nature of PFP (planning of orders and fixed prices) allows the consolidation of the economic model of organic processors who have just started their activity, thus contributing to stabilise their business (Montpellier). In Pays de l'Or, farmers participation to the farmers organisation related to PFP, responds to their desire to support the local community and foster the exchange of knowledge and tools.

Our results confirm the nuanced effects of these programmes, which do not always succeed in breaking out of the dominant patterns due to the differing sustainability requirements of the actors involved, but also to the budgetary constraints of public institutions. Nevertheless, PFP is an opportunity to create farmers collective dynamics at a local scale, favouring exchanges of production practices and knowledge, and creating new economic organisations that foster sustainable producers' access to other markets.

Guests in workplace canteens: Exploring sustainability perceptions and contextual effects of food choice motives

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Presenter: Nora Delvendahl, n.delvendahl@tu-berlin.de (in person)

Highlighting the importance of the out-of-home catering (OOHC) sector as a key lever for change, Germany set a target of 30% of its entire agricultural area being organic by 2030, a target that can only be reached through increasing the share of organic produce in the OOHC sector [1]. Particularly workplace catering settings, where people regularly consume at least one meal per day, are a promising way to mitigate the environmental impact of the agri-food sector while improving human health. Furthermore, interventions in OOHC settings have the potential to 'spillover' into other contexts (e.g. [2,3]), facilitating broader dietary shifts towards sustainable consumption. However, consumer acceptance of potential sustainable changes and understanding how consumers choose food are crucial for developing interventions. Even though research has shown that context matters (e.g. [4,5]) and understanding context effects is highly relevant for contextual spillover [2], how specific food choice motives (FCM) differ by context (i.e. mealtimes, including social and physical context) within-person remains understudied.

Therefore, the current study focuses on how motives in the OOHC context differ to other typical contexts and an imagined ideal meal, and how this relates to consumers' eating habits. Most importantly, we juxtaposition consumers' motives in worksite canteens to the drivers and barriers of sustainable food choices in these canteens.

In an exploratory cross-sectional survey, data was collected online at seven workplace canteens of public institutions in Germany between May and June 2022. In total, data of N = 1.397 participants was analysed.

Initial results revealed that the most important FCMs for both lunch and dinner were health, taste and natural, whereas for breakfast convenience was most important. When imagining an ideal meal, taste is most important, followed by natural and health. Regarding the social context, convenience appears particularly important when eating alone, while sustainability motives (e.g. environment, fair trade) seem somewhat more important when eating with others (e.g. family or friends). In terms of sustainability in the worksite canteens, the current offer was perceived as relatively low regarding healthiness and sustainability aspects, such as regionality, fair trade and climate-friendliness. Aspects that received higher ratings were suitable portion sizes and an avoidance of food waste. Interestingly, almost 50 % of consumers would be accepting higher prices for increasing the share of organic products in the canteens. Regarding reduced meat-consumption, findings are controversial; consumers perceive canteens to offer vegetarian options, but few meat-free days. Notably, while consumers reported high self-efficacy to eat less meat, there is relatively low acceptance for regular meat-free or meat-reduced days. Our findings highlight the relevance of context on FCMs, consumers' perceptions, differential impact of sustainability components and the remaining challenges of reducing meat-consumption. These findings provide concrete directions for sustainability interventions in worksite canteens and hint into which contexts these are most likely to spillover. Such interventions could satisfy consumer motives while simultaneously working towards more sustainable food consumption.

Providing sustainable and inclusive school meals in Berlin secondary schools. An analysis of a transformation process with multiple barriers

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School meals hold great potential to facilitate more sustainable food consumption and production. The provision of healthy meals is linked to improved children's eating habits and long-lasting dietary changes (Ashe and Sonnino 2012). Eating at school is also a viable way to give pupils from different social and economic background access to quality food. On the supply side, public procurement can contribute to sales of regional and organic food that facilitate the development of new value chains.

However, numbers for Germany show that many pupils do not attend school lunches on a regular basis (Arens-Azevedo et al. 2015). Studies have identified several reasons for low interest in school meals such as poor taste and limited choices in terms of dishes, high prices, or an unappealing eating environment. Considerably less studies have so far investigated the situation in secondary schools, although pupils participate even less frequently at that age (ibid.).

This paper aims to explore challenges of a transformation towards sustainable and inclusive school meals in Berlin secondary schools with a special focus on the social context of eating (Hart 2016). This encompasses several aspects including a) class room communities and peers, b) structures that facilitate participation and exchange with caterers, c) inclusiveness of school meals that consider pupils' food diets and cultural/religious background and are easily accessible for eligible pupils to receive free meals.

The research is built on an online-survey which was carried out from November 2021 to May 2022. In total, the sample includes 25 integrative secondary schools in Berlin. We obtained 3.015 responses from pupils of the 8th, 9th and 10th grades. Additionally, official information (e.g. meal plans, prices, policies) and meeting minutes from workshops were used to validate the interpretation of data.

The results show that two thirds of the questioned pupils never eat lunch at school. Many pupils are not satisfied because of the taste, the discomforting atmosphere in canteens or lunch periods that are too short. A higher level of pupil's involvement, eating together with the class, trusting (and knowing) the caterer and claiming free lunch offers have a positive impact on school meal participation.

A successful transformation of the school meal situation is a complex undertaking that involves various actors. There is a need for strategies which foster sustainable and healthy meals as an integrative element of school practices and culture. Acknowledging pupils' perspectives and needs but also involving them more in the processes of improving the school meal situation is one important part of adequate strategies.

References

Arens-Azevedo, Ulrike; Schillmöller, Zita; Hesse, Inga; Paetzelt, Gunnar; Roos-Bugiel, Joana; Glashoff, Marieke (2015). *Qualität der Schulverpflegung – Bundesweite Erhebung*. Bundesministerium für Ernährung und Landwirtschaft (BMEL) (ed.). Hochschule für Angewandte Wissenschaften Hamburg.

Ashe, Leah M.; Sonnino, Roberta (2012). At the crossroads: new paradigms of food security, public health nutrition and school food. *Public health nutrition* 16(6), 1020–1027.
Hart, Caroline Sarojini (2016). The School Food Plan and the social context of food in schools. *Cambridge Journal of Education* 46(2), 211–231.

Life Cycle Impacts of Sustainable Diets following Dietary Guidelines: A Case Study of Canadian Provinces

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Presenter: Basak Topcu (online)

Global modeling studies show that the potential gains in agricultural productivity by 2050 will not be enough to meet climate change targets without changing current diets. Additionally, the global food system is largely responsible for transgressing many of the planetary boundaries through the production of resource-intensive animal-based foods. Globally, meat consumption is growing, and there is overconsumption of protein relative to recommended amounts. Although the recommended ratio of animal-to-plant protein is 40:60, current European diets show ratios of 60:40. Therefore, there is a need to shift towards plant-based diets to meet recommendations. National dietary guidelines (NDG), particularly in Europe, provide guidance on shifting toward plant-based diets. Similarly, in 2019, Canada released a new NDG that encourages increased consumption of plant-based proteins. Currently, Canadians overconsume protein relative to recommended amounts. An example, average diets for the province of Ontario show a 70:30 animal-to-plant protein ratio. However, there is no evidence that following the 2019 Canada's NDG will reduce the environmental impacts of Canadians' diets. Since NDGs are being promoted to influence healthy and sustainable food consumption, it is important to quantify their effectiveness. Thus, the purpose of this research is to evaluate the changes in the environmental impacts of Canadians' diets based on the 2007 and 2019 NDG.

We identified the average diets for each of the ten Canadian provinces, considering self-reported food intake data, for up to 20,000 Canadians from the 2015 Canadian Community Health Survey. Using the foods in these average diets, we formulated diets based on the 2007 and 2019 Canada's NDG. Life cycle assessment was used to quantify the environmental impacts of the current diets, from production to consumption, including food waste along the food supply chain. The impacts assessed are global warming potential (GWP), eutrophication, and freshwater use.

Preliminary findings show that there are provincial differences in the GWP of self-reported average diets across five Canadian provinces, from highest to lowest: Quebec, Alberta, Ontario, British Columbia, and Prince Edward Island. Ontario has the potential to reduce GWP by 30%, by following the 2007 NDG. The GWP reduction is mainly coming from substituting resource-intensive animal-based proteins with less resource-intensive animal-based proteins, as well as plant-based proteins. Across all diets, plant-based proteins contributed less than 5% to GWP, while meat and fish contributed up to 62% of the total GWP. However, ten-year GWP reductions are insufficient to meet climate change and other sustainability goals, and major dietary shifts are needed, particularly substituting animal-based proteins with plant proteins.

This research contributes to the field of sustainable and healthy dietary patterns, particularly to the sustainability of national dietary guidelines, and provides information on how these guidelines perform relative to those in other studies. The results also can inform decision-makers, government bodies, and nutritionists to find new strategies for shifting towards sustainable diets that meet 2050 climate targets. Since this study was based on average Canadian diets, further research is needed on how national dietary guidelines can be used to meet the dietary preferences of culturally and socially diverse populations.

C03: Waste Management in Sustainable Consumption and Production: Perspectives and New Directions

Session Chair: Frieder Rubik

Room: B: Omnia, R: Quantum 4 (max. 30)

Analysis of waste definitions and the scope of waste management in construction: A flow map of concepts

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Classifying the types of Construction and Demolition Waste (CDW) and specifying the domain of its different management methods is important to achieve more accurate quantification of CDW volumes, recovery targets and their calculation rules. This creates the basis for the formulation of waste management policies and the application of regulatory controls to protect the environment. At a global level, many regulations, policies and guidelines prioritise CDW due to the high volume produced each year. However, uncertainty about what is considered as CDW and ambiguity around the scope of waste management methods, presents significant challenges to the adequate management of such waste. Moreover, while the concept of circular economy (CE) in the construction industry has gained academic, governmental, and organisational recognition, it just seems to be a collection of separate and unorganised ideas. Although it is generally understood that a transition to a CE entails a reduced demand for natural resources, such concept is still superficial and vague. Therefore, the purpose of this paper is to gain a critical understanding of CDW classification, and to distinguish between its different management methods. It also discusses current thinking on CE concept in the construction industry. The findings of this paper offer practical insights to improve waste management practices as well as its consequences on CE through assisting with planning, decision-making and setting waste reduction and recovery targets.

Difficulties and Potentials of Packaging Avoidance - A Workplace Ethnography in Food Retailing

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Based on the research question “How is packaging used and negotiated in food retailing?” I want to discuss scopes of action for a more sustainable use of packaging. In an ethnographic analysis, I address packaging functions in the everyday work practices of a dominant packaging-based food system as well as the difficulties of radically transforming these practices. I argue that packaging is not a passive object in this context, but because of its material properties and meanings, it plays a rather crucial role in both the stability of everyday work practices and the dynamics of transformation processes. First, a practice-theoretical investigation of everyday work practices in an Austrian supermarket shows the difficulty of avoiding packaging due to its flexibility and multifunctionality. Using specific empirical examples of central work practices such as product presentation, retail logistics and supermarket representation, I point out the versatility of packaging functions that go beyond approaches of marketing or engineering. Included herein are the placement and preparation of products on the shelf, an assessment of product qualities and quantities as well as the representation of central characteristics of a good supermarket. Attempts for packaging avoidance require reflection of such packaging functions in the daily operations of supermarket assistants. Second, a trans-sequential analysis of an innovation process for plastic reduction in a German wholesale company shows how attachments to plastic cannot be simply transformed top down per management announcements. In fact, practical barriers and normative resistances to change in normalized object relations and work practices contest fundamental innovations for packaging avoidance. My analysis of the dynamic attachments between workers and plastic wrap (and its possible substitutes) shows that merely aiming to abolish plastic is an insufficient approach when it comes to transforming an unsustainable use of plastic packaging. Moreover, packaging avoidance is not about freeing human agency from unsustainable object dependencies, but rather about reshaping the interplay between plastic packaging and human workers with regard to specific practices. Taking up these key findings on the versatility and persistence of plastic packaging in food retailing, I want to discuss the potentials of precycling strategies for a systematic prevention of packaging waste.

Intersectional, Grassroots, Sustainable Consumption Innovations in the UK

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We are facing a global crisis of consumption and waste. Linear resource extraction, mass consumption, and the resulting waste of materials are causing immense environmental and social damage. Transformative solutions are needed, to reduce waste and bring down overall levels of consumption, while at the same time tackling issues of social inequity and injustice. However, existing approaches to sustainable consumption and waste prevention have largely failed to address the environmental and social justice aspects of the waste crisis in a joined-up or intersectional way. Taking “intersectionality” to mean the ways in which multiple, distinct but overlapping, systems of oppression shape society, this paper posits that effective sustainable consumption interventions should address not only the environmental aspects of the challenge, but that in doing so, they should confront and dismantle the injustices embedded in how resources are consumed and waste produced.

This paper examines Grassroots Innovations (G.I.s) as potential intersectional interventions in the consumption and waste crisis. Grassroots Innovations are defined as small-scale, low-cost, local solutions to local problems, developed by civil society to meet community need in the face of institutional failings. G.I.s for waste prevention include reuse and repair initiatives, redistribution, upcycling, and recycling at the community level. The paper draws on interviews with 19 practitioners and experts connected with Grassroots Innovations for waste prevention in the UK. It develops a novel conceptual framework by applying the lens of intersectionality to the study of Grassroots Innovations, and presents an overview of the different kinds of intersectional Grassroots Waste Innovations which currently exist in the UK.

The research finds that there is a diverse range of Grassroots Innovations for waste prevention, and that these G.I.s have the potential to offer meaningful, intersectional routes to both environmental and social justice. However, there is significant variation in how waste prevention G.I.s approach environmental and social justice issues. Some projects operate in a purely pragmatic way to keep resources in circulation and alleviate immediate social pressures, whilst others adopt a more radical, ideologically grounded approach to tackling the systemic causes of waste and social injustice. The ability of Waste G.I.s to be fully intersectional is constrained by lack of capacity and resources, lack of coordination between projects, expectations from funding bodies, and lack of diversity among participants. These barriers need to be addressed, in order to unlock the full potential of intersectional Grassroots Innovations. Nonetheless, Grassroots Innovations offer a promising view of how sustainable consumption challenges can be met at the community level, in a manner which prioritises a diverse range of social needs. Policymakers concerned with finding transformative and socially just interventions for sustainable consumption should therefore take note of this exciting field, and work in partnership with grassroots innovators to support established and emerging projects.

C04: Sustainable Consumption Communication: Narratives (2/3)

Session Chair: Julia Shen

Room: B: Omnia, R: Quantum 2 (max. 30)

Political campaigns as a driver of change: a study into supporting the coal-phase out in Poland

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Transforming our societies towards sustainable future will require systemic and individual-level changes. In this contribution the focus is on political engagement and more specifically on environmental campaigning as an individual behaviour that aims at transforming societies. Political science has looked into political engagement and role of campaigns more generally in the political system, the topic has only more recently become subject to research as part of sustainability and environmental behaviours.

The empirical case studied in this paper focuses on an acceleration of the transition of the energy system in Poland by campaigning for an earlier coal phase out. Poland's electricity sector is currently heavily dependent on coal. Decarbonizing this sector is key for the country's efforts to contribute to reaching climate change mitigation goals. The strategy of the national government for this sector is not clear cut yet. Thus, engagement from the civil society could play an important role to accelerate efforts.

In our study we investigated individual reactions to campaigns for an accelerated coal phase in Poland. For this purpose 1,124 participants were surveyed using an experimental design with three conditions the respondents were randomly assigned to. In all conditions a fictitious scenario of a campaign for an earlier phase out was presented to the participants. The three conditions differed in the arguments that were emphasized in favour of the campaign (environmental - innovation - national interest). After reading the information about the campaign, respondents stated their evaluation of the campaign and an earlier coal phase-out. These responses were analysed in a multivariate approach drawing on regression models. Overall, a majority of participants (54 %) was sceptical about an earlier phase-out in Poland. Around a third (32%) was positive while 14% stated they don't know. The presented campaign was perceived as credible and possibly successful. Respondents reported interest in learning more about it but stated that they were unlikely to take action. People who are currently not heating with coal, have a lower preference for coal as an energy carriers and evaluate the consequences of a coal phase out more positively reacted more positively to the campaign. People with a conservative political orientation felt less favourably while those with an environmental orientation were more positively. Socio-demographic variables were of negligible

relevance. Of the different arguments presented in favour of the campaign, we find a small significant positive effect of environmental arguments.

In conclusion, we find a limited engagement of the civil society to act on behalf of such a transition. This is in contrast with other findings such as a strong preference for renewable energy sources. In the presentation reasons for this inconsistencies will be discussed as well as implications for the transformation of systems.

Narratives for SCP Community Building – practical tools for energy cooperatives developed under the EMUSE research project

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The EMUSE project was set up to research the role of energy cooperatives as multipliers for energy sufficiency, i.e. reduced (energy) consumption. ECs can potentially influence consumption patterns of their members and customers through marketing strategies such as pricing and communications. Their target groups show typically high awareness of and commitment to SCP and already serve as early adopters of sufficiency lifestyles.

Against the backdrop of public energy saving campaigns in the midst of the current German energy crisis, this project therefore focuses on identifying and communicating convincing narratives around household level footprints and activities related to sufficiency lifestyles. Based on initial research on narratives used by ECs in their existing (online) communication, we also practically worked with selected German energy cooperatives.

We developed a tailored practical toolkit and implemented a 10-month workshop series with German energy cooperatives. We gave them individual guidance to develop their own authentic narratives and to design communication projects on sufficiency lifestyles matching their respective target group(s).

Resulting communication projects developed by participating ECs will be implemented in 2023. The refined toolkit will include learnings from the project as well as recommendations for replication. It will be published online and shared with EC associations through train-the-trainer workshops, and will be permanently adopted by a prominent network association offering long-term coaching and other expert advisory services to ECs.

This unique toolkit was developed consecutively throughout the project with direct input by case study partners and considers the specific needs of energy cooperatives. Due to the small number of ECs selected for the intense workshop series, the single cases and results might not be directly transferable to other cooperatives or sectors. The workshop tools, however, were designed in a generic and adjustable way that can easily be transferred to other ECs or any other type of member organizations in the field of sharing economy or sustainable lifestyles (such as solidary farming organisations). However, workshop formats, especially regarding time commitment and number of sessions, need careful adjustment to the needs of targeted practitioners to avoid high drop-out rates.

Questions and insights resulting from the practitioner workshops strongly revolved around the goal of community building among (potential) members and customers. Co-creative group discussions during the work with narratives and communication projects led us to uncover three core challenges and potential solutions:

- Solving the paradox of producer vs. consumer interest by working together for a shared vision.
- Solving the paradox of sacrifice vs. lifestyle gains by moving from footprint measurement to 'handprint' activities.
- Solving the paradox of systemic challenges vs. individual efforts by collaboration across energy cooperatives.

Participating ECs aimed to support increased collaboration and sense of belonging between (potential) members hoping to gain active support for their few, if any, full-time staff. At the same

time, their local communities contribute to a strong foundation of the wider social movement for a green, decentralized and democratic energy transition.
EMUSE project website: <https://e-suffizienz.adelphi.de>

Understanding and Managing Narratives in the Science-Society and Policy interface

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In sustainability sciences, narratives and their role in transformation processes are gaining interest [1]. Social scientists call for alternative future-oriented narratives while highlighting problems with current dominant narratives [2]. At the same time, research projects increasingly seek to strengthen the socio-political relevance and outreach. Also, funding agencies increasingly expect public outreach. In this context, the possibilities for researchers to engage in societal narratives from their scientific position are discussed as a strategy for science-society and policy interaction. This interest reaches beyond discourse scholars to scholars across diverse disciplines. However, the conceptualization of “narratives” originates in structuralist ontologies and is therefore often poorly understood by scientists who build on more positivist ontologies. The vague understandings of “narratives” and how they are embedded in larger discourses and paradigms obstruct the scholarly dialog on the topic. The core question is: can and should researchers in the natural and technological sciences engage with and benefit from the ideas on narratives for its science society and policy interaction, and if yes how?

In this perspective, we aim to help deal with this question. Thus, we pursue two main objectives: First, we help to structure the scholarly dialog and shed light on the basic premises of societal discourses and the discursive context of science by drawing on discourse theory [3], work on science-policy interactions [4], and science- and technology studies [5]. We integrate sustainability sciences in a discursive perspective on society and map out the positions and options towards a (deliberate) engagement in societal narratives. Second, we provide concrete suggestions for integrating narrative engagement in research projects, in their design, and in outreach activities. We address non-discourse scholars that seek to produce policy-relevant research or contribute to a societal transition toward increased sustainability. For scientists drawing on positivist ontologies, we seek to give guidance to answer the following questions:

- how should I engage in societal narratives, given my role as a scientist?
- how can I engage in societal narratives to strengthen the science, society and policy interaction?
- What options may I want to consider?

We believe that engaging with what the discourse perspective has to offer on societal and policy processes and engaging with the societal narratives lead to increased reflexivity and awareness of the own underlying values and assumptions. This helps position the research in a discursive landscape already in the conceiving phase and helps make unintentional engagement a conscious process, increasing research transparency. In sum, scientists' reflexive and active engagement with societal and political narratives can help disclose the added value of sustainability research and strengthens its societal and political relevance.

References

1. Simoens MC, et al. *Sustain Sci*. 2022
2. Hagbert P, et al. *environ values*. 2021
3. Hajer M, et al. *Journal of Environmental Policy & Planning*. 2005
4. Pielke RA. *The honest broker: Making sense of science in policy and politics*. 2007.
5. Bauer S, et al., eds. *Science and technology studies: Klassische Positionen und aktuelle Perspektiven*. 2020.

The role of narratives of care in sustainable consumption

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As we move forward to tackle sustainability challenges, the need for narratives of hope gains importance. Narratives of hope present transformation pathways and allow us to visualize sustainable futures, shaping our decisions and fostering action. Narratives can stimulate concerns, emotions, and are contagious, generating changes in consumption. The dominant homo economicus narrative presents humans as self-centered and disconnected from others. This narrative leads to consumption practices that prioritize individual interests, ignoring the harm imposed on a broader context. A hopeless narrative based on humanity's "selfish nature" becomes paralyzing, as this shapes how we see ourselves and interact with others. However, this dominant narrative is incomplete, since we are also capable of altruism and care. Moving toward a more comprehensive narrative of hope in which we also acknowledge our capacity of caring for other humans and more-than-humans, could reshape the dynamics within social-ecological systems towards sustainable consumption.

In this theoretical paper, we provide a framework for understanding the potential of narratives of care in the transformation of complex socioeconomic systems toward sustainable consumption. To do so, we set a dialogue among Complex Adaptive Systems theory, Narrative Psychology, Narrative Therapy, and the Ethics of Care. We find that we can question and transform the given-for-granted narrative around the nature of human beings through the tools provided by Narrative Therapy. Based on this, we can find alternative narratives that include both the self-centered part of human nature and our capacity to care for the more-than-human world. These alternative narratives release us from the paralyzing idea of our inherent unsustainability, and can help us navigate the tensions emerging from sustainable consumption by detaching it from the idea of self-sacrifice.

This research contributes to the discussion on the relevance of cultural transformations to achieve sustainability. Firstly, it allows us to understand the role of narratives of care in navigating the tensions that emerge in sustainable consumption. Secondly, it explores the importance of expanding the meaning of care to the more-than-human world. Thirdly, it provides a framework for understanding sustainable consumption as a matter of care, rather than a sacrifice. It is of interest to research areas such as sustainable consumption, sustainable lifestyles, social marketing, cultural dynamics, and narratives.

In practice, this research aids in promoting sustainable lifestyles, as it explores how to transform the self-centered narrative at the root of our unsustainability problems, towards a more comprehensive narrative that includes caring for other humans and more-than-humans. It is of interest to policymakers developing transformational policies toward sustainable consumption. It aids in implementing such policies by offering an alternative framework in which sustainable consumption choices are not based on sacrifices but on humanity's natural willingness to care for others. Finally, it contributes to the United Nations Agenda for Sustainable Development - particularly to the SDG 12-Responsible Consumption and Production - by proposing cultural changes that can lead to lifestyles in harmony with nature.

Knowing sustainable tourism: disputed knowledge claims, communication and framing in Swedish sustainable tourism schemes

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There are numerous sustainability challenges in the tourism sector, ranging from greenhouse gas emissions from transport to social and environmental impacts in destinations. Attempts to steer tourism and leisure towards more sustainable forms are constantly made, through for example voluntary commitment initiatives, labelling schemes, and national and international policies and laws. Such attempts indubitably practice conscious and unconscious framing in their use and application of knowledge and communication about sustainability and change – framing that has the potential to either influence, or alienate, consumers towards, or away from, more sustainable forms of tourism. This paper sets out to investigate how knowledge claims about sustainability and sustainable consumption are framed in initiatives that aim to facilitate more sustainable forms of consumption in the tourism and leisure sector. It does so through two case studies of sustainability schemes for tourism in Sweden – one focused on nature tourism nationally and the other on regional tourism in Western Sweden. Given the interpretative prerogative of certification and labelling schemes, both towards consumers as well as tourism businesses, these appear as especially suited to interrogate the power and potential of framing sustainability knowledge and change work. Utilising the theoretical framework of framing, we perform document analysis and interviews with representatives of each initiative, in order to understand how ideas and knowledge about what is and is not sustainable, which efforts are needed, and how change can be achieved, are interpreted, challenged, endorsed, and communicated. Preliminary findings suggest that these schemes are both frontrunners in how sustainable consumption knowledge is formulated, applied, and communicated in the tourism and leisure sector, as well as loci for multiple, sometimes contradictory, framings of sustainability and change, for example having the aim to increase tourism while also acknowledging that tourism has negative impacts on the environment. We conclude with implications and suggestions for future research and practice. Specifically, in order to overcome the potential pitfalls of, for example, contradictory framings, and to support the mainstreaming of more sustainable forms of tourism, we suggest that future research and practice focus on co-production of intentional reframing strategies and processes. Although the empirical work is undertaken in a Swedish context, we also highlight the international relevance for mainstreaming more sustainable forms of tourism and leisure.

C05: Digitalization and Product Passports in Circular Economies

Session Chair: Judith van Leeuwen
Room: B: Orion, R: B8020 (max. 40)

From concept to information model: digital product passports for circular battery management

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This paper provides an information model of a digital battery passport (DBP) for sustainable electric vehicle battery (EVB) management based on empirical data. The focus was placed on the end of life (EoL) and battery second use (B2U) of the EVB life cycle as those phases offer value chain loop-closing strategies (i.e., repurposing and recycling), thus contributing to more circular and sustainable EVB value chains.

The information model development was driven by pursuing a literature review to identify state-of-the-art information modelling approaches, semi-structured expert interviews with EVB value chain actors affiliated with the EoL and B2U, and a qualitative content analysis.

The results illustrate data needs and requirements of EoL and B2U actors to support a sustainable and circular EVB management. For example, for an EoL affiliated actor battery chemistry was identified to be key, whilst for an B2U affiliated actor information about the battery status was stressed. Information about sustainability performances, however, were not attributed with high importance by both actor groups. Based on the synthesis of the literature review and empirical results an UML-based information modelling approach is presented.

This paper complements current DBP and sustainability research by an empirical study which supports the definition of information flows needed to enable a sustainable product management (SPM). Furthermore, it holds clear practical relevance as it is able to foster the understanding of practitioners and policymakers about data needs and requirements for SPM. Furthermore, the proposed UML information modelling approach may support DBP prototype development.

Digital Product Passport: a game changer for sustainable production?

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Under the EU Green Deal framework, Europe set the objective of becoming the first climate-neutral region by 2050, which was followed by a series of initiatives aimed at improving the sustainability of production processes.

According to the European Commission (EC), up to 80% of a product's lifecycle environmental impact is determined at the design stage. To reduce such a high impact, as well as to increase the durability and improve the reparability and recyclability of products, the EC released a Proposal for an Eco-design for Sustainable Products Regulation (ESPR) in March 2022.

One of the key regulatory elements of such a proposal is the Digital Product Passport (DPP). It consists of a machine-readable identification number that will allow tracking the origin of all materials and components used in the manufacturing process of everyday consumer goods. The implementation of digital product passports in supply chains is designed to support sustainable product production, by enabling the transition to a circular economy and thereby increasing material and energy efficiency, extending product lifetimes, and optimising product use.

Through the Proposal for an Eco-design for Sustainable Products Regulation, the EU's existing ecodesign rules, currently applied to electric appliances only, shall apply also to textiles, construction materials, industrial and electric vehicle batteries, and at least one other of the key value chains identified in the Circular Economy Action Plan such as consumer electronics, packaging, and food.

One of the most mentioned advantages of the DPP in the literature is the fact that, allowing a more efficient sharing of information across value chains, it enhances transparency, allowing consumers, producers and other stakeholders to know the environmental impacts of products and adapt their decisions accordingly to such an information obtained via the DPP. However, the potential of the DPP for advancing sufficiency is, to date, still unexplored and the present paper purports to fill in this gap by addressing the question of how can the Digital Product Passport contribute for a legal-by-design economic model where sufficiency, rather than affluence, is the paradigm.

Among other aspects, supported in literature review and based upon existing empirical research, this paper claims that the DPP has the potential of addressing and combatting effectively planned obsolescence, the policy of designing products with an artificially shortened lifespan or a purposely frail design, to force people to purchase functional replacements.

Recycled Product Certification for Construction and Demolition Waste Resources: A Case Study in Australia

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Growing population and urbanisation have led to a significant increase in construction and demolition (C&D) waste generation. A large proportion of this waste is destined for landfills causing a range of negative social, environmental and economic effects. Therefore, there are urgent calls for governments and the built environment sector to improve C&D waste management systems. While using products with recycled content (PwRC) has emerged as a targeted solution under various resource efficiency initiatives such as circular economy (CE) and zero net carbon (ZNC), there is still skepticism towards using these resources in the sector. In response to this limitation, recycled product certification (RPC), otherwise known as sustainability labeling, is brought to life aiming to offer more confidence in wide applications of PwRC among the key stakeholders. However, the application of PRC in the sector is not fully understood. Therefore, this study aims to evaluate their limitations and advantages by reviewing the existing literature and evaluating a case study. Through the analysis of key literature and case study findings, this research identified the primary limitations and advantages of the adoption of RCP schemes in the sector. Subsequently, the research provides a suite of recommendations that will aid in promoting the application of RPC schemes. The findings of this study can immediately guide industry practitioners, policymakers and independent auditing service providers to create new or modify the existing RCP schemes. Indirectly, the findings contribute to increasing uptake of PwRC, creating, and stimulating end-markets for PwRC derived from C&D waste stream.

Sustainable by design. Fair and transparent implementation of the eco-score through digital product passports.

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A sustainable future requires a fundamental change in the way we consume and produce. The types and amounts of foods we eat and the way such foods are produced, processed, and transported, compromise the stability and resilience of natural resources and biodiversity, and contribute to climate change (Global Policy Report 2022).

Data and technology have been increasingly used to increase the sustainability of food systems (von Braun et al. 2023). One of the most recent and disruptive advancements in green technology consists of the digital product passport, which was launched in March 2022 within the Eco-design and Sustainable Products Regulation, which in turn was part of the Sustainable Products Initiative (SPI).

Digital product passports purport to be windows into how sustainable a product is across the whole chain. They allow producers to identify materials and resources used in products, oversee industrial circularity and product design performance, and demonstrate their responsible business practices. As for consumers, they allow them to track products' origin and have an overview of the impact a product has throughout its life cycle (King et al. 2023), allowing them to opt for those products which rank better as far as environmental sustainability is concerned.

This is an objective shared with a food label that has been used by businesses in the domains of computing, distribution and catering, and advocated for, as a mandatory Front-of-Package (FoP) label, by an initiative of European citizens, namely, the "eco-score".

As part of "the Farm-to-Fork Strategy for a fair, healthy, and environmentally-friendly food system", announced in May 2020 as part of the Green Deal, the European Commission committed to empowering consumers through FoP labeling information (Europarl 2022). Even though nutrition scores by far predominate in both policy and academic literature, sustainability concerns have brought the need for an assessment of the viability, reliability, and legal compliance of sustainability scores as well.

This paper contributes new knowledge and understanding about the role that digital product passports might play in promoting the eco-score as a smart information tool capable of empowering consumers towards more sustainable food choices. The present research is significant for policymakers, as well as industrial and technical communities. The novelty of this research lies in the argument that the digitalization of food-related scores, which have so far been highly criticized based on their rigidity and unreliability, will technically allow for adaptability and personalization of the scores, increasing consumer reliance and desirability by consumers, producers, and legal policymakers.

Sustainability of software: assessing environmental benefits and burdens of green consumption recommendations in online shops

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Problem statement: As outlined in the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), drastic action is needed to reduce greenhouse gas (GHG) emissions and limit the global temperature increase to 1.5°C. When it comes to the contribution of information and communication technologies (ICTs) to climate change, two dominant narratives can be observed. ICTs can reduce global greenhouse gas (GHG) emissions, e.g. by promoting sustainable consumption, but they also cause increased GHG emissions, e.g. through the production and use phases of ICTs. It is therefore important to assess whether ICTs mitigate or exacerbate the net climate impact and which factors influence this. In particular, the impacts of software are still under-researched and require the development of new approaches. Software based on machine learning models (ML) can indirectly consume large amounts of energy. The net effect in complex real-world applications is usually not measured consistently, including software and user behaviour.

Theoretical approach and aim of the empirical study: When assessing the environmental impacts of products and services, researchers often conduct life cycle assessments (LCAs). Applying a life cycle perspective to the environmental impacts of digitisation in terms of actual and potential environmental impacts was the subject of the 73rd LCA Discussion Forum in 2019. With the growing interest in the energy consumption of software and in particular of ML models, researchers have started to build on LCA approaches to assessing the climate impacts of software products, the education of ML models and the intervention of ML models in production. In this study, we provide an end-to-end assessment to quantify the net global warming potential (GWP) of an online shopping recommendation system that encourages users to make sustainable consumption decisions. We aim to identify hotspots of particularly high energy demand or savings potentials that could help improve the net climate impact of sustainability-oriented software systems.

Method: For this interdisciplinary study, we use different methods and tools from LCA, consumer behaviour research, carbon footprint measurements for ML models and data from the literature. We have chosen the LCA methodology as a guideline but do not claim to conduct a complete and comprehensive LCA according to the ISO standard. In this study, we look at the energy consumed in the production and use of the software and the corresponding CO₂ emissions, and compare these with the potential CO₂e saved from more sustainable recommended options.

Practical implications and results: Our results show that the net effect of sustainable purchasing recommendations can be positive - despite the use of modern ML technology. These results show that, if carefully designed, software can indirectly contribute to reducing global carbon emissions. However, we also found that quantifying the emissions generated during the lifecycle of the software is indeed measurable to some extent, while assuming the impact on sustainable consumption relies on a wider range of estimates based on mostly secondary data sources. Nevertheless, it is important to assess the environmental impacts caused by the development of software and ML tools and to integrate environmental aspects early in the design process.

C06: Towards the reduction of meat and dairy eating – consumers perception, motivation and barriers (2/2)

Session Chair: Dominika Maison, Katarzyna Stasiuk
Room: B: Omnia, R: Quantum 3 (max. 30)

Adjusting look, name and taste associations to reduce disgust with insect-based foods: Effect of visual, informative and scent clues on insect-based food

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Insects as high-quality protein sources in Western diets can support the transition to circular agriculture. However, disgust at eating insects is a barrier to the acceptance of insect-based foods. Of the many studies that have looked at overcoming this hurdle, little is known about the impact of evoking positive associations through the framing of the product by the look, name, taste, smell and informative claims. We conducted a set of surveys and experiments on facets of disgust towards insects as an ingredient by testing, look, packaging information, taste and smell. The goal of the series of studies was to investigate the potential of product concepts and targeted communication on reducing the disgust of insect-based foods in North-West Europe. In different online surveys, respondents were confronted with visual and informative elements such as labels and claims, and product names containing the word insect or worm. Experimentally, we tested the smell preferences of insect-based burger patties and analysed the favourite taste options of different target groups in focus groups and cooking workshops. The results showed that images of favourite ingredients, such as chocolate and hazelnuts, on the packaging are particularly effective in reducing disgust. The same applies to a transparent window in the packaging. The presence of the organic seal and the new Entotrust seal significantly increased the assumed food safety. Statements about protein content and sustainability were less effective, and the image of a cricket had a significant impact on increasing disgust. The product name evokes a positive attitude towards the product if the product name only indirectly refers to insects in the form of a neologism. Smell and taste are equally important for the acceptance of a new insect-based food product whereas meat eaters might be a promising target group. Our results suggest that the packaging design should be used consciously to reduce disgust and thus support the purchase probability. The product concepts need further creativity regarding taste and smell to make insect-based food a normal part of everyday meals instead of specific functional food. Recommendations for the insect-food industry are discussed aiming to increase consumer acceptance of insects as a sustainable source of nutrition.

Relating Meat Consumption to Environmental Harm: Cognitive Dissonance to Reduce Meat Consumption

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The acknowledgement of responsible consumption and production as one of the 17 sustainable development goals to tackle climate change until 2030 calls for in-depth research on how to change consumption behaviours. Especially the negative environmental impact of meat consumption has been frequently discussed in politics and society. Animal welfare has been extensively studied as a driver to reduce meat consumption. Extant research provides evidence that interventions linking meat to living animals or relating to the humanness are effective in activating cognitive dissonance, which is a psychological state occurring when a meat-eater's behaviour is inconsistent with her values, beliefs or attitudes. However, consumers tend to evade meat-related cognitive dissonance by avoiding or ignoring information that increases this dissonance (e.g., by dissociating meat from the living animal). Further mechanisms to overcome meat-related cognitive dissonance include denial of animal suffering, dichotomizing animals into those we love and those we eat or pro-meat justifications.

Besides animal welfare-related triggers, meat-related cognitive dissonance can also be experienced over environmental or health concerns of meat consumption. However, empirical research examining the effect of interventions relating to these aspects is missing. Against this background, our research aims to (i) add to existing knowledge on intervention types that lead to meat-related cognitive dissonance, focusing especially on environment-related interventions, (ii) identify consumers' prevention and reduction mechanisms of cognitive dissonance linked to those environmental triggers, and (iii) test the effectiveness of interventions addressing those mechanisms in reducing actual meat consumption and thereby provide recommendations for managerial practices. Theoretically, we expect that receiving information linking meat consumption to environmental harm will increase meat eaters' cognitive dissonance. In response to experiencing cognitive dissonance, we argue that consumers might change behavioural intentions in favour of non-meat dishes aiming to reduce cognitive dissonance. Furthermore, we propose that this effect will be attenuated for individuals with higher environmental concern. Empirically, we will test these effects with an experimental online questionnaire (Study 1) and a laboratory experiment (Study 2). In Study 1, we employ a representative sample to test whether participants who indicated the intention of choosing a meat dish and were then shown information about the environmental impact of a meat-based diet develop higher levels of cognitive dissonance compared to participants who intended to choose a plant-based dish. In Study 2, we test whether higher levels of cognitive dissonance increase the tendency of actually choosing a plant-based dish and if not, which other strategies to reduce cognitive dissonance can be observed. Moreover, we study if participants' behaviour is influenced by their individual degree of environmental concern.

In sum, the planned studies aim to contribute to research on cognitive dissonance and meat-eating by examining the role of information on environmental harm on cognitive dissonance and actual choice behaviour. These findings will provide valuable insights for organisations and governmental agencies interested in motivating people to reduce their meat-intake.

What is the consumers' process to reduce meat consumption? The journey of flexitarians analysed through the Life Course Paradigm Theory

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A change in eating behavior directs individuals to follow a more flexible diet that is not as strict as vegetarianism or veganism. This phenomenon is called flexitarianism. It is well known that eating behavior is directly related to the contexts in which people live, whether economic, social, or cultural. In this context, some questions arise: which factors have driven the consumption change to a flexitarian diet? Which are the triggers to this new diet? Which are the difficulties during this process of protein reduction? Finally, how does this process occur? This study aims to analyze the behavior of flexitarians by understanding the trajectory of meat consumption reduction through the lens of the Life Course Paradigm Theory (LCP), which could allow observing the change in meat consumption at different moments. It started before the reduction, going through the moment of decrease, understanding how consumers adapted to it, and finally, the result. We used a qualitative method with in-depth semi-structured interviews with 24 participants who had reduced their meat consumption for at least three months. The analyses started with content analysis and defining previous and subsequent categories. In the moment "before change," the results show health, social influence, information, and beliefs influenced the change. Health and information also appear in the triggers category, besides ecological motivation, associated with other factors. Also, some factors influenced the reduction, such as the meat price, political context, and the covid-19 pandemic. These facilitated reducing meat consumption since people had more time to learn how to cook and read. Some respondents pointed to cultural issues as motives for keeping meat consumption, e.g., when the person is with some familiar or at some party. The adaptation process shows that acquiring a new social identity, such as being married or the imminence to be a mother, influences the desire to change consumption. Another reason is an increase in the family's income. On the other hand, the social pressure when a person goes against the omnivorous social norm is a stressful process that people who reduce their consumption face. The process ends with some diet categories classified as the frequency of meat consumption. As a result of this research, we identified moments in life when people change their relationship with meat consumption, such as childhood, health issues, access to information, participation in social groups, and spirituality. This research's main contribution is the identification of previous influence factors in the consumption change, the process consumers go through when adapting to a new food habit, and the barriers faced in the process. Finally, considering the lack of alternatives to substitute meat and other obstacles consumers face, food companies have an excellent opportunity to include more plant-based options in their portfolio.

Facilitating and hindering factors in the sustainable food transition: A COM-B approach

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Transitioning to more sustainable food-related lifestyles is urgently needed to decrease greenhouse gas emissions causing climate change. While the majority of research on this topic has focused on people's motivations for adopting sustainable eating behaviors, we argue that the COM-B model offers a more complete and situated understanding of people's decisions to engage in or refrain from sustainable eating behaviors by incorporating capabilities (psychological and physical capacity to engage in a particular act) and opportunities (factors located in the physical as well as social environment that enable or prompt behavior). Taking a COM-B approach, this qualitative study based on 15 semi-structured interviews examined factors that promote and hinder the transition to plant-based foods of students, who are in a crucial life stage developing purchasing and eating behavior. Results showed that respondents were generally motivated to eat less animal-based products, although motivation was higher for reducing meat intake than for decreasing dairy consumption. Nevertheless, respondents struggled to incorporate more sustainable food consumption into their daily behavioral repertoires. Important hindering factors were the complexity of finding clear and unambiguous information (i.e., psychological capabilities), pricing and availability of meat and dairy alternatives (i.e., physical opportunities), and respondents' social environment (i.e., social opportunities). Importantly, facilitating and hindering factors were oftentimes interrelated. Social environments shape motivation and capabilities, thereby creating vicious or virtuous transition cycles, and high motivation can increase capabilities and decrease the hindering influence of opportunities. This study highlights the importance of going beyond motivation, showing that in order to understand the transition to sustainable eating behaviors tailored interventions that take into account personal as well as contextual factors are necessary.

Rockstars of the protein transition? Understanding how chefs' craft practice inhibits a shift towards reduced animal-based food consumption

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One of the most effective ways to mitigate climate change is to shift to more plant-based consumption practices. In the context of such a shift, hands-on professionals in the food sector, such as chefs, are an important group of actors. Yet, while chefs are often seen as creative and innovative trendsetters and opinion leaders with high potential to initiate societal change towards sustainability, most restaurants in wealthier countries still predominantly serve meat and fish. In fact, people on average eat more meat and fish in restaurants than at home, which implies that chefs are lagging behind in the protein shift. We aim to understand this impasse. We use theoretical lenses of practice theory and craftsmanship to answer the question if and how chefs' professional craft practice, including their relationship with animal- and plant-based material and with guests, withholds chefs from cooking with less animal-based foods. Drawing on 23 semi-structured interviews, including photo-elicitation, with a diverse mix of executive head chefs of Dutch restaurants in terms of menu type (animal/plant ratio), sector (fine dining/regular), and geographical location (city/rural), we found, firstly, that inherent qualitative differences between animal- and plant-based material complicate plant-based cooking, as chefs perceive animal products to have unique and distinctive qualities in bringing depth and flavour to dishes. However, we observe that these differences are embedded in a historical relationship with animal-based material, such as dish composition conventions and personal signatures. A second finding concerns the importance of the consumer society (i.e., consumer demand). Even though there is an increased demand for plant-based food, the demand for animal-based food remains high. In a consumer society, craftspeople are also business people, and adhering to guests' expectations is essential to chefs' work and the restaurant's financial health. The results combined explain why chefs almost collectively perceive plant-based cooking as more difficult and challenging. We argue that chefs' ability to innovate is not necessarily materialized in creating plant-based dishes, because their creative process is bounded by a reciprocal relationship between affordances of material and embodied skill, as well as by a dynamic between them and their guests' expectations. In order to develop an embodied relationship with plant-based material, we recommend that plant-based education should not only be implemented in culinary schools but should also be targeted to advanced professionals.

C07: Sustainability Transition: Towards a social-psychological understanding of human motivations within the production-consumption system (3/3)

Session Chair: Soumyajit Bhar
Room: B: Atlas, R: Atlas 2 (max. 80)

Engaging the European publics on of what provides the greatest public benefit from the use of consumer food data: Utilising “serious game” in deliberations about public benefit

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To achieve the necessary transformation in the European food system, innovative infrastructures for data acquisition and integration are needed. The EU-funded project COMFOCUS (Community on Food Consumer Science) seeks to develop a digital platform that links food consumer data across Europe (<https://comfocus.eu/>). Under the GDPR, the use of food consumer data is possible under two conditions: either through the explicit consent of the research participant whose data is being used, or if its use is for “public benefit” (GDPR, 2018). Despite the significance that the consideration of public benefit has in defining how consumer data is used, there is limited understanding of how the publics conceptualise “public benefit” in the context of food consumer data, much of which has been studied using simple survey methodology. To explore such complex and abstract topic we utilised a serious game “PlayDecide” across 6 countries (UK, Italy, Denmark, Slovakia, Germany, Spain), as part of the COMFOCUS project. PlayDecide is a widely used discussion format (<https://playdecide.eu/>) that enables the participants to discuss and debate, with minimal interference from the facilitator, on the policy issues that are contested, complex or relatively less known. It has been successfully used for over 15 years on a variety of topics, and its outcome is a consensus-based vote on the ranking of different policy options – in the case of our study, on different types of “public benefit” for the use of food consumer data. We chose PlayDecide as an ideal engagement method to help us understand how the publics reason about public benefit relevant to food consumer data; how people achieve consensus about how to rank order public benefits; and the role of deliberation in shifting the participants’ individual responses prior and after the game. The discussions are stimulated through a series of “cards” that highlight the key information, issues

and examples that the participants can use to help them make a decision about their votes on policy. We have recruit 16 people for 2 focus groups (8 per group) in each of six countries: one with higher education level participants (university degree or more) and one with a lower education level (less than university degree). The following data are analysed: the participants' initial position on the issue of what constitutes public benefit, and their position after the discussion; the transcripts from the discussions; the consensus vote at the end of the discussion. The results feed into the discussion about the methodological innovation in exploring those issues that are at the intersection of individual private motivations and public benefits to achieve sustainability transition; and will highlight the role of deliberation and co-constructed narrative in this process.

Strengthening consumer awareness and perceived proximity to cocoa farmers from Ghana: Effects of social vs. environmental consumer information on psychological outcomes

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Problem statement: We are confronted with a high prevalence of problematic conditions in the cocoa sector, such as child labor, extensive use of pesticides, or deforestation. In this context, West Africa as the world's major sourcing region of raw cocoa and Germany as a key market of chocolate consumption are connected in a world-spanning network. Globalized value chains with many stakeholders are becoming more complex and therefore less comprehensible for consumers, augmenting the distance between consumers and producers. With a growing awareness for sustainability issues related to chocolate, various initiatives in the private and public sector (e.g., companies, certification agencies, governments) promote consumer information, aiming at an increase in responsible chocolate consumption. However, little is known about the differential effects of information elements displaying the social or ecological aspects of local conditions in the production countries on different consumer outcomes.

Research questions: Against this backdrop, the present research investigates how information about the environmental or social impacts of cocoa production in Ghana affects the perceived psychological, social, physical and economic proximity between German chocolate consumers and Ghanaian cocoa farmers. Also, it focuses on the effects of this information on consumers' problem awareness, attitudes towards, intentions to buy and willingness to pay a higher price for sustainably sourced chocolate.

Theoretical approach: Research suggests that creating a sense of proximity between consumers and the producers of the products they consume can increase responsible consumer behavior. Furthermore, the selection and presentation of information elements has an impact on consumers' attitudinal and behavioral outcomes. Based on these insights, the differential effects of ecological vs. social information provision will be explored.

Methods: A written text manipulation in a 2x2 factorial design is developed, focusing on high vs. no information about the social (factor 1) and ecological (factor 2) aspects of cocoa farming in Ghana. As dependent variables, consumers' perception of proximity to the cocoa farmers are measured with a self-developed scale based on Gillani et al. (2019) consisting in four subscales (psychological, social, physical and economic proximity). Also, consumers' problem awareness about the conditions in cocoa farming, their attitude towards and intention to buy sustainable chocolate are examined. Finally, effects on consumers' willingness to pay (WTP) a higher price for a chocolate bar with fairtrade and organic certification in comparison to a chocolate bar without certification are explored.

Findings: Data collection is not yet completed. Effects of social, ecological, and combined information about cocoa farming compared to a baseline text (neither social nor ecological information) will be reported. The strongest effects on participants' perception of proximity, problem awareness, attitudes, intention to buy and WTP are expected for the condition combining social and ecological information.

Conclusions and Implications: The present research aims at shedding some light on the differential effects of message elements about the conditions in cocoa farming on different

consumer outcomes. This is relevant for the design of product packaging, websites or campaigns, which aim to promote consumer decisions in favor of sustainable chocolate products that meet ecological and social standards.

Social network communication and socio-psychological variables of the individual in the case of adoption of a plant-based diet.

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Although there is significant interest on the global scene in promoting plant-based diets to achieve some of the Sustainable Development Goals (SDGs), the results of diffusion are far from satisfactory. Academics propose to entangle this effort by addressing the challenges of diffusion of social innovations.

Social innovations generate different adoption attitudes, some of them related to socio-psychological aspects, on the part of potential adopters. This research work aims to better understand the diffusion of social innovations, such as plant-based diets, which may induce socio-psychological concerns in potential adopters.

In this sense, this research work postulates that communication between the prior adopter and the potential adopter cannot be considered a sufficient condition for triggering the imitation process. In this vein, special attention is paid to imitation processes that may depend on some attitudinal characteristics of the potential adopter.

An exploratory, inductive, theory-building effort has been carried out, based on a cross-case analysis of three different adopter profiles, with a total of 69 semi-structured interviews.

A new conceptual framework for understanding the effects on the evolution of communication and imitation processes in the diffusion of social innovation is outlined. New socio-technological insights emerge on the theoretical and practical implications for the effectiveness of the diffusion of social innovations.

The effects of environmental justice values and social norms on sustainable food-related lifestyles: two experimental studies

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Background: Food consumption is responsible for 20-35% of greenhouse gas emissions. Transitioning to sustainable food-related lifestyles (SFRL) is essential to curb climate change. Transition studies have provided substantial insight into technological innovations and the food production system. Yet, less attention has been paid to consumer behavior change, while this is crucial for successful sustainability transitions. In addition, the research that has been conducted among consumers has mainly focused on individual motivation. The roles of other individual factors and social-level factors have not yet been frequently studied. Our research aimed to increase insight into factors underlying consumers' transition to SFRL, focusing specifically on underlying environmental justice values and social norm perceptions.

Methods: We manipulated environmental justice values (Study 1: intergenerational values vs global values vs ecological values vs control, N = 213) and social norms (Study 2, descriptive norms vs injunctive norms vs control, N = 157). We examined effects on intentions to engage in SFRL, willingness to pay for policies aimed at increasing SFRL, and green identity, and reciprocal effects between norms and values.

Findings: Values did not have a direct effect on intentions and willingness to pay. Values also did not change social norm perceptions. Social norms, on the other hand, did have a direct effect on intentions to engage in SFRL and willingness to pay for policies aimed at increasing SFRL, with descriptive norms increasing intentions and injunctive norms decreasing willingness to pay. Descriptive social norms also augmented environmental justice values. Both values and norms influenced green identity.

Discussion and conclusion: Values and norms both play a role in SFRL. More research is needed to further tease apart their separate and interactive effects to better understand the dynamic interplay of norms and values. Insights into these factors underlying intentions and willingness to engage in the transition to sustainable food-related lifestyles can point to possible entry points for policies and interventions.

Shaping a knowledge and innovation agenda for a responsible Dutch dairy transition

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Currently, climate change and biodiversity loss are the most pressing sustainability issues. In the Netherlands, and other regions in Europe, dairy farming plays an important role in both issues. Approximately 60% of Dutch agricultural land is in use by dairy farms, which is 28% of the entire country (roughly 1.2 million ha). Roughly 1.6 million cows are kept in the Netherlands with an average milk yields of 9255 kg/animal in 2020. This is high compared to the EU average of 7500 kg/animal. This high production is achieved, among others, by importing nutrients to the farm. Due to the high nutrient import and livestock density, the Netherlands has a manure surplus. In the Netherlands, making dairy farming more land-based and nature-inclusive, is part of the current circular agriculture policy vision of Dutch government. The idea is that farms will not have a manure surplus if dairy farms have relatively low numbers of cows per ha or if they have a partnership with a nearby arable farmer that uses the manure. This is quite an ambitious plan as it is estimated that roughly 40% of Dutch dairy farmers do not meet the suggested definition of land-based dairy farming. Numerous contextual factors play a role in this, such as the high prices and restricted availability of land and social and cultural factors: what does it mean to be a 'good' farmer for farmers (do they want to be a nature-inclusive farmer or do they prefer a more intensive farm?) And how is this influenced by their social environment? Especially, the latter raises the question whether, and how, actors in the dairy farming network think about land-based and nature-inclusive agriculture. Are they willing and able to take their responsibility to bring about change? And how should we understand the 'responsibility' of these actors? This thinking triggered a modest study in which we organized two workshops with actors active in the entire dairy value chain. We invited them to talk about two scenarios: an extensive and nature inclusive dairy farming scenario and a more intensive dairy farming scenario with collaborating with arable farmers. During the workshop we invited participants to identify the facilitators and barriers to change toward realizing one of the two scenario's, and we harvested the knowledge questions that participants have about the realization of the scenario's. These two elements were used to shape a research agenda and to reflect on possible roles research can play in supporting established actors to change.

C08: Living Labs: Reflecting on the structuration of transformation; addressing impacts, replicability and scalability - Evaluation and Assessment (3/4)

Session Chair: Julia Backhaus, Julien Forbat
Room: B: Omnia, R: Auditorium (max. 108)

How to evaluate the outcomes and impacts of Living Labs? Key insights from a literature review and interviews with implementers

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Living Labs as a method have been gaining in popularity in recent years, as a bounded and physical space in which diverse actors can collaborate in the co-creation, testing and upscaling of novel socio-technical configurations in real-life contexts situated within broader regime-level social change processes. Examples of such experimentation might be attempts to reduce energy usage and related emissions, support cycling practices, improve the quality of a neighborhood, reduce food waste, implement sharing practices, organize care tasks, among others. One main question that emerges from living lab experimentation is how outcomes and impacts of such processes might be evaluated, in relation to achieving the aims set out in the trans-disciplinary experiment, but also as an essential step towards gathering learnings towards the replicability of a living lab experiment, or their scalability towards system-wide socio-technical transitions. In this contribution, we propose a systematic review of the literature on outcome and impact assessments when it comes to living lab methods: we scan scientific articles to uncover how living labs are assessed, as well as how the outcomes and impacts of living labs are evaluated. Based on an understanding of how different forms of knowledge contribute to sustainability transitions and building on gaps identified in the literature (Galway et al 2022; Beaudoin et al 2022; Bronson et al 2021; Hossain et al 2019), we discuss in what way the outcomes and impacts relate to 1) different aims in relation to sustainability, from environmental impacts and resource usage, to human wellbeing and social justice, 2) different scales, from niche to regime and landscape levels, 3) different evaluation tools and methods, 4) different environments or living lab settings, and 5) different outcomes in terms of degrees of participation and co-knowledge production from information to consultation and co-creation. We complement the review of the literature with a preliminary analysis of 15 interviews with actors engaged in Living Lab methods, towards uncovering 5) new forms of assessments, and 6) best practices in outcome and impact assessments.

Beaudoin, C., Joncoux, S., Jasmin, et al (2022). A research agenda for evaluating living labs as an open innovation model for environmental and agricultural sustainability. *Environmental Challenges*, 7, 100505. <https://doi.org/https://doi.org/10.1016/j.envc.2022.100505>

Bronson, K., Devkota, R., & Nguyen, V. (2021). Moving toward Generalizability? A Scoping Review on Measuring the Impact of Living Labs. *Sustainability*, 13(2), 502.

<https://www.mdpi.com/2071-1050/13/2/502>

Galway, L. P., Levkoe, C. Z., Portinga, R. L. W., & Milun, K. (2022). A Scoping Review Examining Governance, Co-Creation, and Social and Ecological Justice in Living Labs Literature. *Challenges*, 13(1), 1. <https://www.mdpi.com/2078-1547/13/1/1>

Hossain, M., Leminen, S., & Westerlund, M. (2019). A systematic review of living lab literature. *Journal of Cleaner Production*, 213, 976-988.

<https://doi.org/https://doi.org/10.1016/j.jclepro.2018.12.257>

Monitoring transformative change within a living lab: a participatory survey design for base-lining key data

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The quantitative monitoring of energy savings and the greenhouse-gas mitigation potential introduced by interventions is central to a living lab approach that aims to introduce transformative change within the discourse on climate change. However, valid population data on consumption patterns and mobility behaviour is often scarce, especially when the living lab is set up initially. Within the SWEET funding program (SWiss Energy research for the Energy Transition) of the Swiss Federal Office of Energy (SFOE) in the SWICE consortium (Sustainable Wellbeing for the individual and the Collectivity in the Energy transition), the modern “Suurstoffi” Site in the municipality of Risch-Rotkreuz serves as a living lab. “Suurstoffi” is a mixed neighbourhood that accommodates living, working and leisure activities and offers a starting point for interventions and investigations. As complex public-private partnerships, living labs offer an efficient approach to integrating partners in a collaborative methodology. Thus, our paper outlines a participatory research design for the development of a population survey to gather key data to serve as a base line for the current state of a living lab (e.g., T0-measurement). The authors describe the development of the survey design in the form of a process of community collaboration. In fact, researchers, public bodies, a real-estate company, industry partners and transport companies have served as a sounding board for the methodological design and content of our study. Based on residents' address data provided by the municipality, a cross-sectional survey was carried out between October and November 2022 (response rate = 33%, n=300). The paper presents the underlying theoretical approaches of the survey concept, which are the transtheoretical model of behaviour change, the theory of planned behaviour and mobility lifestyles, complemented by various socio-demographics and key metrics on transportation behaviour, employment biography and household information. We will highlight the first results of key data that are useful in the domain of climate discourse. Conclusions will be drawn regarding how our base-line key data will serve as a foundation for monitoring the energy-reduction potential of the planned interventions that will be implemented in 2023 in the living lab. The paper will end by setting out the practical and scientific implications of our study design against the background of the living-lab approach.

Development of a comprehensive integrated impact assessment tool for Living Labs

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Literature shows that there is no accepted general standard procedure for sustainability assessment or any integrated impact assessment of interventions in Living Labs. The overall objective of this study is to develop a framework an integrated impact assessment that will provide the significant tool to assess the efficiency, effectiveness, and the sustainability of the interventions and solutions developed within Living Labs. We particularly focus on interventions and solutions developed with Living Lab methodologies for practice changes in relation to key energy usage (e.g. heating, mobility, household consumption)

We first discuss and identify points where definitions (e.g. impact, impact evaluation, assessment and so on) differentiate among different disciplines, and offer a glossary to created based on the conversations with different stakeholders of the Living Labs about how impact is used and understood, in order to come to a shared understanding.

We then present the proposed conceptual and methodological framework for the integrated impact assessment tool that i) first qualifies and quantifies the proposed interventions on the three (social, economic, technological/environmental) dimensions and their inter-category relations; ii) secondly identifies three impacts in an integrated manner in order to identify beneficial interventions and expose trade-offs fully and explicitly. An example could be 'avoided infrastructure' as the impact, transmission and distribution line losses avoided thanks to demand flexibility measures, encompasses economic (e.g. avoided cost), environmental (e.g. avoided CO2) as well as quality of life social impact.

Finally, we finally outline the necessary characteristics of the impact assessment tool, addressing the non-linearity of the innovation process of a Living Lab. This includes a repository of indicators for environmental, social and economic impact at different temporality (e.g. short, medium and long term), linked with measurement techniques (e.g surveys, willingness-to-pay elicitation, interviewing, focus groups, energy use data) depending on the assessment technique (e.g. counterfactual, boundless etc.)

Trade-offs, legitimacy, and scalability: To what extent can living labs fulfil the expectations with regard to societal transformations towards sustainability?

Antonietta Di Giulio, University of Basel

Rico Defila, University of Basel

Presenter: Antonietta Di Giulio, antonietta.digiulio@unibas.ch (in person)

In the last decade, the call to science to contribute to societal change has been intensified. It has cumulated into the call to science to broaden from transdisciplinary research and from contributing transformation knowledge to conducting transformative research and actual transforming societies. One research format that has attracted much attention by this is the format of so-called 'real-world laboratories' ('Reallabore' in German), also called living labs in some discourses. Such research formats distinguish themselves by being inter- and transdisciplinary and by conducting interventions in 'real' situations and contexts that are aimed at producing lasting transformations (see, e.g., the special issue 2018 by GAIA, 27/S1). This research format encounters many challenges and at the same time, expectations are high with regard to the impact of real-world laboratories towards sustainability. Since 2015, we are accompanying real-world laboratories in Germany by conducting accompanying research, by coaching them, and by facilitating peer-to-peer learning among such projects (Defila & Di Giulio 2018).

Based on these seven years of experience, we will, in our paper, raise some questions that projects such as real-world laboratories face and that apply to other transformative research formats as well. These questions shall initiate a debate about both the chances and limitations of such research formats, about reasonable expectations on them, and about what kind of tricky research decisions have to be taken. These questions cover the following dimensions:

- Scalability: Can real-world laboratories be scaled to issues of sustainability that cannot be addressed on a local level? Are they doomed to be applied to topics that are appealing to both citizen-consumers and funders?
- Legitimacy: How to produce the legitimacy to actually conduct transformative activities, to intervene in society (incl. who can be involved)?
- Dilemmas and trade-offs: What kind of dilemmas have to be solved in day-to-day research decisions and what kind of trade-offs occur between research goals, transformative goals, between immediate and superordinate goals?

Based on unfolding these questions by examples taken from our experience, we will engage in a discussion with participants.

Defila R., Di Giulio A. (2018): What is it good for? Reflecting and systematizing accompanying research to research programs. In: GAIA, 27(S1), 97-104.
doi: 10.14512/gaia.27.S1.17 (pr)

C09: Edurruption: The disruptive potential of education for transforming consumerism - Case Studies (3/3)

Session Chair: Robert Didham

Room: B: Omnia, R: Momentum 1 (max. 30)

School gardens in Cyprus - Challenges and lessons

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Poor diets are a major contributor to the rising prevalence of malnutrition, a leading risk factor for the global disease burden (1,2). Furthermore, the way food is produced, consumed, and wasted contributes to environmental degradation (3). School gardens (SG) is an important tool to teach children about sustainable production / consumption, healthy diets, livelihood skills and environmental awareness (4, 5, 6). However, there are obstacles in setting up / operating a SG. These include lack of time and training amongst teachers, lack of commitment in maintenance, lack in continuity in leadership, lack of funding, low engagement with the school community (7, 8, 9). It is important to find strategies on how SG can become school-integrated and sustained (10). The ultimate goal is that SG are not seen as an isolated activity in a school, but they should be part of a 'whole-school approach', becoming the source of healthy, school-grown food and promoting community involvement (11).

In Cyprus, children's interest in gardening was associated with the satisfaction of various psychological needs, e.g., competence, which are prerequisites of environmental motivation (12). At the same time, the incorporation of sustainable nutrition in educational practices in Cyprus involves many challenges (13). This research work focuses on SG to address the following:

- a) How do teachers in Cyprus envision the incorporation of the SG into the school food system?
- b) Which are the challenges in creating a SG in Cyprus that is integrated in the school and is sustained?

For the first research question, the methodology involves in-depth interviews with a purposive sample of primary school teachers with knowledge in Education for Sustainable Development. For the second research question, a case study of a primary school in which an organic SG was used as a 'learning site' is presented including in-depth interviews with school stakeholders. According to teachers, the SG helps children to understand how their food is produced and how they can become more responsible consumers by consuming food that has not travelled miles to reach their plate. Furthermore, SG provide experiential learning for the students and also promote student involvement in school food production and consumption.

Based on the case study, there is a variety of challenges in operating an integrated SG that can be sustained. These include: a difficulty in pedagogical planning in relation to the way a SG can be used as an educational tool in the framework of project-based learning, inadequate involvement of the school community as a whole, unclear division of roles and inadequate

spread of roles, insufficient teacher training, limited connection with the curriculum, technical difficulties.

Suggestions for an integrated SG that is sustained include teacher training on technical and pedagogical issues in relation to SG, creation of platforms for exchange of good practices, a strategy from the beginning to set up mechanisms that ensure involvement of the school community as a whole, reinforcement of the connection of the SG with the curriculum. This research work can be useful for education policymakers, educators as well as schools and institutions interested in this topic.

References

1. GBD 2017 Risk Factor Collaborators. 2018. Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks for 195 countries and territories, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet*, 392: 1923–1994.
2. UNICEF/WHO/The World Bank Group. 2021. Joint child malnutrition estimates: levels and trends in child malnutrition: key findings of the 2021 edition. Geneva: World Health Organization. Licence: CC BY-NC-SA 3.0 IGO.
<https://www.who.int/publications/i/item/9789240025257>.
3. FAO & WHO. 2019. Sustainable healthy diets – Guiding principles. Rome.
4. FAO, 2020. School-based food and nutrition education – A white paper on the current state, principles, challenges and recommendations for low- and middle-income countries. Rome.
<https://doi.org/10.4060/cb2064en>
5. FAO, 2010. A new deal for school gardens. Rome.
6. Gonsalves J., et al. 2020. School gardens: multiple functions and multiple outcomes.
7. Webb S., J. Diaz and C. Campbell, 2018. Understanding the barriers for school garden success: expert consensus to guide extension programming. *EDIS*, WC315.
8. Hoover A., S. Vandyousefi, B. Martin, K. Nikah,...L.N. Davis. 2021. Barriers, strategies and resources to thriving school gardens. *Journal of Nutrition Education and Behaviour*, 53 (7): 591-601.
9. Burt Kate G., Hersch B. Luesse, Jennifer Rakoff, Andrea Ventura, Marissa Burgermaster, 2018. "School Gardens in the United States: Current Barriers to Integration and Sustainability", *American Journal of Public Health* 108, no. 11: pp. 1543-1549.
<https://doi.org/10.2105/AJPH.2018.304674>
10. Burt Kate G., P. Koch and I. Contento. 2017. Development of the GREEN (Garden Resources, Education and Environmental Nexus) Tool: An Evidence-Based Model for School Garden Integration. *Journal of the Academy of Nutrition and Dietetics*. 117, no 10: pp 1517-1527.
11. Wals, A. E. J. 2019. Sustainability-oriented ecologies of learning as a response to systemic global dysfunction. In R. Barnett & N. Jackson (Eds.), *Learning ecologies: Sightings, possibilities, and emerging practices* (p. 18). London: Taylor & Francis.
12. Christodoulou A. & K. Korfiatis. 2018. "Children's Interest in School Garden Projects, Environmental Motivation and Intention to Act: A Case Study from a Primary School of Cyprus." *Applied Environmental Education and Communication* 18, no. 1: 2-12.
13. Maliotou, M. N., & Liarakou, G. 2022. Teachers' Perceptions and Educational Practices on Sustainable Nutrition in Cyprus. *Journal of Education for Sustainable Development*, 16(1–2), 61–79. <https://doi.org/10.1177/09734082221116858>

Transformative learning processes in community repair - insights from living labs

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The connection between collaborative repair, care work and responsibility for sustainable development has only received little attention in research so far. Connecting the different perspectives, however, opens up new spaces for thought and action that can potentially support the achievement of various sustainability goals, such as promoting sustainable consumption, reducing (global) inequalities and combating climate change. Social practices of repairing and DIY are described by the protagonists of the so-called repair and maker movement as forms of taking responsibility for the environment and society (cf. Baier et al. 2016). In their view, it is not only the overcoming of the supposed throwaway mentality that could contribute to achieving the goals of the global sustainability agenda, but also a much earlier change in the handling of consumer goods towards care and responsibility in the sense of "taking care of the future" (Groves 2015). In communities of repair, individual and collective processes of change take place that can be described as forms of transformative learning (Singer-Brodowski 2016). Transformative learning concepts describe how learning processes enable adults to transform their previous meanings and know-how and thus to engage in critical thinking and autonomous judgement. Our assumption is that transformative learning as a concept could bridge the current gap between social and individual insights into the necessity of socio-ecological change and the ability of taking care of the (global) future through solidarity-based action. The paper will look at transformative learning processes taking place in the context of community repair and identifies challenges and conditions for learning. It will provide first answers to the following questions: What kind of learning processes happen in people engaging in community repair for the first time? How is solidarity-based action learned in this context? Do the experiences and learning processes also influence other areas of life and encourage sustainable consumption and solidarity-based action beyond the repair of objects? To answer the questions living labs were conducted in which the participants visited different Repair Cafés over a ten-month period of time and documented those visits. A mixed-method approach based on narrative-biographical interviews, in-depth face-to-face-interviews and living labs documentation has been conducted to investigate processes of learning. Initial results show that organising a visit to the Repair Cafe and collaborative repair itself are a challenging undertaking for many. The organisational and interpersonal components play an important role before an engagement with the objects themselves and their larger context can take place. For most, the experiences of cognitive, physical and sensory repair and creation, and of doing things together, are varied: they range from the fear of not being able to take care of people and objects, to the joy of maintaining and restoring relationships between people and objects. The learning processes themselves bring openness to further repair and experimentation with objects. So far, there is little evidence that communal repairing provides thought-provoking impulses that would go beyond repair and stimulate further solidarity-based action.

Learning stuff while having fun? - Testing the effectiveness of a game about sustainable consumption in a class-settings compared to casual play

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Exploring new methods that can nurture sustainable, mindful consumption patterns in the young generation becomes more and more important in times of changing climate and intensifying resource limitations. Educational as well as entertainment games around sustainability concepts have been explored in recent years and proven effective in engaging students on the topic and increasing their awareness and knowledge. While sustainability education has been expanding throughout schools and university settings, it remains difficult to reach ordinary citizens with educational games and expand education beyond classrooms. The theme of the game (The L.O.O.P) studied in this research, evolves around the topic of consumption and happiness, and was developed to be both an educational as well as an entertainment game. It has the goal for players to achieve a high level of happiness through moderate amount of work and purchases combined with collaborative consumption (such as sharing, recycling, purchasing second hand) and the achievement of activities and goals.

The study aims to test whether playing the game about sustainable consumption can achieve similar learning outcomes when played in (a) a casual game-play setting compared to (b) a facilitated in-class gaming session (incl. debriefing and discussions, embedded within a sustainability-related course). Gaming-sessions with a total of over 350 students were held in online and offline to explore this question. The students' personal consumption behaviour, personal beliefs and environmental concern, knowledge and awareness questions around sustainability and collaborative consumption was evaluated and statistically analysed through pre- and post-game surveys as well as selected questionnaires on game strategy. Initial findings show that serious gaming can enable players to experience real sustainability issues in a gaming context, increase their knowledge around sustainable and collaborative consumption and increase awareness on sufficiency, materialism and resource limitation and implications of over-consumption in both, classroom as well casual play sessions. Larger increases in awareness around sustainable consumption were observed from students in casual play session, which might originate from the lack of prior exposure to the topic for students that didn't take the class.

This study is one of the first studies with a large dataset to provide evidence that games played in a casual setting can enhance knowledge and awareness around sustainability and could attain a similar educational impact and potentially trigger behaviour change if played for entertainment outside a class setting without guidance by an instructor, discussions, or debriefing sessions. These findings highlighting the potential of such casual approaches to sustainability education to reach a wider audience on the topic.

Co-creation of sustainable lifestyle practices in eco-clubs

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Ecological crises pose a significant social and political challenge in contemporary societies. Eventually, consumption presents one of the biggest difficulties of a shift from material and energy intensive economies and lifestyles toward an environmentally sustainable society (Spash & Dobernig, 2017). Current consumption patterns need to be changed, requiring societies to shift cultural norms and appropriate new consumer habits which are within planetary boundaries. Beyond pressuring societal norms of continuous consumption growth, behavioural change for the adoption of a sustainable lifestyle is challenging due to the complexity of human behaviour (Costanzo et al., 1986). Nevertheless, this much-needed shift can be supported by the social nature of consumption and with the help of communities as individuals could receive emotional, cognitive and practical support from the group by being members and participating in the shared meaning-making processes (Forno & Graziano 2014).

Moving away from the ideal of value-free science, and taking into account the need for immediate change, participatory and action research methods can offer a new paradigm of knowledge generation and implementation of transformative societal change. In order to explore, deep-understanding and contribute to moving toward sustainable lifestyles, we have initiated participatory research among university students in form of eco-clubs. Eco-clubs refer to a group of people interested in sustainable consumption who regularly meet in order to change their everyday practices and habits. Our research relies on two approaches: 1. Concept of eco-teams developed by the Global Action Plan International (GAP, 1994) organisation and which were successfully initiated in Hungary by the Association of Conscious Consumers (Tudatos Vásárlók Egyesülete). 2. Eco-clubs and Eco-School programs in public education (Lee, 2017).

Following the principles of co-operative inquiry among participatory methods, eco-clubs were organized as joint learning sessions in which every participant equally takes part in the process of knowledge-creation and implementation of change. Participants all become co-researchers of sustainable consumption during the cycles of planning-acting-reflecting.

Between 2021 and 2022 four eco-clubs were organized among students of the Corvinus University of Budapest, each consisting of 7-9 participants. During their weekly meetings, they acted as peers to explore the different aspects of sustainable consumption and to implement change in their lifestyle and consumption habits. The eco-clubs were facilitated by one or two students, and senior researchers acted as mentors.

As a result of this learning process, a significant shift can be observed among participants towards sustainable consumption practices. Compared to conventional learning and research methods, eco-clubs empower participants through peer learning and co-creating knowledge. The emotional involvement reinforces participants' motivation to take sustainable choices, and the personal relationships and the community provides positive reinforcement for their engagement in sustainability. In that sense, participatory research methods have the potential to enhance transformation in the field of sustainable consumption practices.

Students' insights into consumption patterns and their impact on climate change

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One of the first steps in encouraging sustainability/promoting sustainable habits in our society is to raise awareness of alternative consumption patterns and their impacts on climate change. In this context, higher education should play an important role in strengthening attitudes, values and actions that are compatible with sustainable development. In order to contribute more actively to the transformation of consumption patterns towards more sustainable models, it is important to know the opinions, ideas and motivations of the people who will certainly be the agents of change, in this case students. To this end, the engineering school Tecnun has designed an awareness programme with the objective of assessing the level of knowledge of undergraduate and master's degree students in an engineering school on relevant sustainability and climate change topics. The programme was launched for 5 consecutive weeks, with small prizes raffled among the participants each week to encourage them to participate.

As a result, 634 people participated in at least some of the weeks (45% of all students), with an average of 325 people from different degrees and courses participating in each phase of the competition. Students were asked about their knowledge of the four proposed topics: energy consumption, mobility patterns, responsible consumption and waste generation. They were also asked specifically about ideas or initiatives that could be addressed on campus to improve the sustainability of these aspects. Finally, they were asked about their knowledge of climate change and the factors influencing it, and their responses were compared with those of a 2017 study conducted in Europe on citizens' perceptions of climate change. The obtained results show that concern about this problem is greater among this group of students. The data gathered were analyzed considering gender, course, and degree in which the students are enrolled.

The results of this awareness programme provided information on the level of knowledge of engineering students and interesting proposals that they felt should be implemented on campus. These insights could help the university board set priorities for implementing sustainable actions on campus. Another relevant conclusion is the need for these types of initiatives in higher education institutions as levers to increase students' awareness level leading to more sustainable habits.

C10: Teaching and Learning Sustainable Consumption: Insights into an Evolving Field

Session Chair: Jordan King, Daniel Fischer

Room: B: Omnia, R: Momentum 2 (max. 30)

The demands of students and employers, as well as the urgency of social-ecological challenges are pressuring higher education to devote greater attention to exploring topics such as sustainability and social change (Stewart et al., 2022). The area of “sustainable consumption” can be a particularly tricky subject area to engage with (Sahakian & Seyfang, 2018). Teaching and learning in this area involves understanding consumption dynamics as well as uncovering the different interpretations of and approaches to sustainability (Middlemiss, 2018). Amidst this context, this session aims to provide insights into the evolving field of teaching and learning sustainable consumption by bringing together different perspectives in order to critically examine trends in research and practice.

Building on the momentum of a steady increase in courses addressing sustainable consumption over the past decade, this 75-minute session will serve to launch a guidebook (Fischer et al., 2023) that presents innovative approaches to teaching and learning, while also bringing to the fore conceptual debates around higher education and sustainability. The guidebook incorporates over 50 teaching examples, many from the SCORAI community, that illustrate the multifaceted nature of practice in the field. In the session, we will present a synthesis of these examples (King et al., in preparation) to highlight the key features and potential directions for sustainable consumption teaching and learning. We will describe the pedagogies and objectives that characterize this diverse subject area with examples coming from a range of contexts. Then, we will reflect on the roles of instructors in teaching this tricky topic and the implications of how they understand sustainable consumption and the link between education and social change.

The session will build from a presentation of the themes and trends discovered through an analysis of the guidebook teaching examples to I have several contributors to the book share their examples. The contributors will highlight innovative pedagogies, practical considerations, and reflect on the implications of their approaches. Participants will then be invited to interact with the contributors to gain insights on their teaching practices and think about applications in their own work. Together, the session leaders, presenters, and participants will reflect on possibilities in teaching sustainable consumption to contribute to social learning in higher education and beyond. The session will conclude by gathering input from participants on the dynamic priorities and goals for the field moving forward, both in research and practice.

We hope that this interactive format, which engages with both empirical data and practical examples, enables participants to think critically about the possibilities of teaching and learning sustainable consumption. By offering this space for synthesis, reflection, and deliberation, we hope that the session will inspire conference participants, whether as seasoned or early-career instructors or practitioners outside of higher education, to recognize the role of teaching and learning in exploring the complex dimensions of sustainable consumption as both concept and practice.

References

- Fischer, D., Sahakian, M., King, J., Dyer, J., & Seyfang, G. (Eds.) (2023). Teaching and learning sustainable consumption: A guidebook. Routledge.
- King, J., Fischer, D., Sahakian, M., Dyer, J., & Seyfang, G. (in preparation). Innovations in teaching and learning sustainable consumption: An analysis of practical insights from instructors.
- Middlemiss, L. (2018). Sustainable consumption: Key issues. Routledge.

Sahakian, M., & Seyfang, G. (2018). A sustainable consumption teaching review: From building competencies to transformative learning. *Journal of Cleaner Production*, 198, 231-241.

<https://doi.org/10.1016/j.jclepro.2018.06.238>

Stewart, I.S., Hurth, V., & Sterling, S. (2022). Editorial: Re-purposing universities for sustainable human progress. *Frontiers in Sustainability*, 3, 859393.

<https://doi.org/10.3389/frsus.2022.859393>

Line-up of speakers:

Session Co-Organizer: Jordan King, Arizona State University, jaking24@asu.edu

Session Co-Organizer: Daniel Fischer, Wageningen University & Research, daniel.fischer@wur.nl

Session Co-Organizer: Marlyne Sahakian, University of Geneva, marlyne.sahakian@unige.ch

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Contributor: Charlotte Jensen, CONCITO, cj@concito.dk

Contributor: Sylvia Lorek, Sustainable Europe Research Institute, Sylvia.Lorek@seri.de

C11: Sustainability Stories: Writing, story-telling and creative practice in sustainability research

Session Chair: Sarah Royston

Room: B: Omnia, R: Spectrum (max. 30)

This participatory session focuses on how researchers can explore environmental pasts, presents and futures through stories. It asks: in what ways can writing and related creative practices help us to understand how we've reached this moment of polycrisis, to face current challenges, and to imagine alternative sustainable futures? The session is for any researchers that read, write or tell stories (including fiction, creative non-fiction and poetry) inside or outside academia, and want to explore the intersections of creative practice and research.

The session offers an unusual angle on sustainable consumption and production, drawing explicitly on perspectives from the arts and humanities (often excluded from debates on the circular economy and socio-technical transitions). Bringing together academics with creative practitioners, this session creates a space for mutual learning and skill-sharing. It particularly speaks to the conference theme of: "Discourses, dialogue, narratives, and social learning for strong sustainable consumption and production systems", but also has relevance across many other themes, for example, those dealing with the engagement of stakeholders, or with envisaging alternative futures, since writing and story-telling can be powerful tools for these tasks.

The session will include:

- Short talks from sustainability researchers and creative practitioners about their work, including inspiring examples of writing/story-telling that they have read or been involved in.
- Practical exercises, prompts and activities to explore and develop the use of story-telling and creative practice in participants' own work.
- Open discussion among all participants about their own reading/writing/story-telling practice. What non-academic texts do we read to nourish our minds and motivate us in our work? What kinds of creative writing happens within our community that's unseen (and maybe un-acknowledged) within the academic domain? What kinds of stories would we like to tell, individually and collectively, and how could they fit into our fast-paced academic lives (and livelihoods)?

The session includes talks from four sustainability researchers/practitioners with interests in storytelling and creative practice:

Lara Houston (Anglia Ruskin University) was recently a Research Fellow on the H2020 funded CreaTures project (Creative Practice for Transformational Futures) at the University of Sussex. This transdisciplinary project highlights how arts, design and citizen-led creative projects can contribute to addressing climate change.

Mel Rohse (Anglia Ruskin University) researches personal and collective narratives of sustainable energy and water consumption, including through the recent project 'Stories of Change: Exploring energy and community in the past, present and future'.

Sarah Royston (Anglia Ruskin University) carries out research on energy governance. She has published over 20 works of fiction and co-ordinates the Creative Practices cluster at ARU's Global Sustainability Institute.

Ruth Mourik is CEO of Duneworks, a consultancy focusing on societal aspects of sustainability, including behaviour change and engagement.

Line-up of speakers:

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Lara Houston, University of Sussex and Anglia Ruskin University, lara.houston@aru.ac.uk

Mel Rohse, Anglia Ruskin University, mel.rohse@aru.ac.uk

Ruth Mourik, Duneworks, ruth.mourik@duneworks.nl

C12: EU 1.5° Lifestyles: Individual and structural level perspectives on possible and necessary change

Session Chair: Doris Fuchs

Room: B: Omnia, R: Podium (max. 269)

Content: In its analyses of drivers and mitigation pathways for climate change, the IPCC has concluded that limiting the global temperature increase needs demand-side actions and lifestyle changes. However, which lifestyle changes will be needed, and what do we know about their public acceptance and (individual, societal, and ecologic) side effects? How do structural barriers and enablers impact the potential shift towards sustainable lifestyles, specifically lifestyles that fit within the Paris climate target of 1.5°?

The proposed panel will explore these questions. It will focus on a range of lifestyle options and their likely sustainability impacts and adoption rates. The spotlight will also be on deep economic, political, societal and technological structures and their effects on the adoption and sustainability of lifestyle options. These questions will be linked to insights on the information needs of policy makers as well as research needs. Thereby, the panel aims to provide a multi-faceted discussion on 1.5° Lifestyles and their potential contribution to the sustainability transformation.

The session brings together expertise from an international group of social scientists and practitioners involved in sustainable lifestyles research and action. The session will adopt a dialogue format with short input statements by all panelists, addressing predefined questions, and a subsequent moderated debate between the panel and with the audience.

Line-up of speakers:

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Edina Vadovics, GreenDependent Institute, edina@greendependent.org

D: Friday, July 7, 8.30-9.45

D01: Debunking myths about sustainable consumption and lifestyles

Session Chair: Oksana Mont

Room: B: Omnia, R: Podium (max. 269)

Debunking myths for more sustainable consumption: three myths and three ways forward from the social sciences

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This contribution proposes to demonstrate how shedding a social sciences light on consumption dynamics can help bring clarity to the question of how to support more sustainable forms of consumption, in sharp contrast to individualized or techno-centric approaches which have dominated to date. We debunk three main myths tied to how the problem of un-sustainable consumption is typically framed. The first myth is based on the idea that innovative technological solutions are just around the corner, and will act as an effective and immediate panacea to un-sustainable consumption patterns. Those promoting such technologies know best what is needed, and the proposed solution need only be taken up by willing consumers – relegating the question of social acceptance to an afterthought, once the technology is already designed and ready to be deployed. The second myth is based on the assumption that better-informed consumers will make the ‘right’ choices, based on equal access to similar information. And yet, knowledge is not always available nor comprehensible. Such approaches, often deployed by economists or psychologists, give great weight to individual action. They assume that individuals are driven by motives that are both clear and stable. The third myth assumes that ‘culture’, ‘social norms’ and other social factors impose themselves on individuals and exist ‘out there’ in society, to be internalized by individuals. The notion of ‘consumer culture’ can be problematic in this sense, when seen as something that magically exists in society and which consumers are subservient to. The ‘market’ is another presumably neutral societal phenomenon that people must engage with in order to consume more sustainably, whether through boycotting or boycotting. These ‘internal’ versus ‘external’ influences fail to recognize the ways in which meanings about how things ought or should be are tied up with everyday life practices, involving how people get around, prepare a meal or heat their homes, as embodied in these ways of being and doing, and related material arrangements. To conclude, we suggest that a series of assumptions must be brought into sustainable consumption actions and policies, to counter these myths. These involve accounting for interdependencies in complex social systems, along with lock-in effects and processes of institutionalization, and finally the question of social justice and inclusivity with a recognition of power dynamics.

Towards Consumption Corridors: Shedding myths in pursuit of social change

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“The power of the stories we tell about technological innovation, efficiency, consumer sovereignty, and individual freedom is formidable. This is not surprising. These stories are familiar, comforting, often hopeful, grounded in familiar truths, and thus unabashedly alluring. They appeal to a deeply human fascination with the novel, the shiny, the creative and clever.” This citation, taken from the Consumption Corridors book (Fuchs et al 2021: p. 69), introduces a series of ‘myths’ that are present in our societies, and effectively validate existing and familiar power structures. These myths reveal how we have become locked into debilitating material and social structures, holding us back – as scientists, practitioners, policy-makers and citizens – from engaging in the transformative change needed towards sustainable wellbeing, now and in the future. In this contribution, we review four central myths, including: the myth of freedom without responsibility; the myth of technological innovation as savior; the myth of consumer sovereignty and individual responsibility; and the myth of market solutions. Once we present these myths, we then discuss how Consumption Corridors act as a promising concept for contesting such myths. Notably, we reveal the importance of focusing on a good life and human flourishing within planetary limits (while acknowledging other relevant environmental considerations), the necessary distinction between universal human needs and socially-embedded satisfiers, as well as the participatory processes that are required for the establishment of Consumption Corridors.

Sustainable lifestyle choices in food and their rebound effects

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Both technological solutions and behavioural changes have been identified as important strategies for reducing the sustainability crisis we face (IPCC, 2022). One of the areas in which environmental and social impacts are closely linked to choices in everyday life is food. The environmental impacts of food production and consumption lead to some of the highest consumption-based GHG emissions, resource use (Ivanova et al., 2020), and energy consumption (Owen et al., 2017). At the same time, the food domain has one of the highest

potentials for reducing impacts and resource use by consumer intervention (Wynes & Nicholas, 2017). Emerging studies identify strategies for households to reduce their environmental and social impacts substantially. Our research within the “EU 1.5-degree Lifestyles” project developed a list of eight impactful strategies based on the extensive literature review and interviews with experts. These strategies include: avoiding food waste at home, drinking tap water in place of bottled water and manufactured drinks, reducing animal-based products, switching to a vegan and a vegetarian diet, eating only organic, and only seasonal vegetables and fruit. These options have different reductions tCO₂eq/cap. A systematic literature review of 53 studies from different countries demonstrated that a vegan diet is associated with a mean reduction of 0.9 tCO₂eq/cap, while a vegetarian diet – with 0.5 tCO₂eq/cap reduction (Ivanova et al., 2020).

At the same time, evidence emerges that projections associated with potential improvements almost always come short due to the so-called rebound effects. The rebound effect is a widely used umbrella term for various economic and psychological responses to improved efficiency and sufficiency in different domains of production and consumption that lead to reduced effectiveness of measures and offsetting some of the potential savings. The majority of studies so far have been on the rebound effects of energy efficiency measures (Owen et al., 2017). In our research, we seek to explore extant knowledge about the mechanisms for rebound effects in the food domain and their scale. We are conducting a systematic literature review of rebound effects associated with food-related lifestyle options. We use the SCOPUS database to make targeted searches in titles, abstracts and keywords, and we code the final samples of articles in Nvivo. We hypothesise that the aforementioned sustainable lifestyle strategies for households might have different mechanisms for rebound effects. Thus, we aim to test this hypothesis by mapping and categorising rebound mechanisms associated with individual food strategies and comparing them across the strategies. The results will be of value for policymakers who develop sustainable food policy measures and seek to mitigate associated rebound effects to improve policy effectiveness.

1 - <https://onepointfivelifestyles.eu/>

2 - For the methodology used for collecting data and developing 50 sustainable lifestyle options see <https://onepointfivelifestyles.eu/news/how-can-we-move-towards-15deg-living>

The Power of Premises in Sustainable Consumption Research and Action

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Alongside a broadly communicated increase in urgency, action towards more sustainable consumption increases as well, for example in the form of more sophisticated policy programmes, engaged research, more sustainable supply chains and business models as well as public engagement or even civil disobedience. Notably, the activities pursued and strategies proposed diverge widely, not least due to differing perspectives which result in different approaches to transformative change. Crucially, fundamental assumptions, for example on the role of and room for agency or on social dynamics, form the smallest particles of which such perspectives are made. Over time, a number of dominant approaches that emerged in the disciplinary fields of economics and psychology have been joined by alternative theories and perspectives drawing on broader social science perspectives. Yet, in the increasingly heated climate, amidst heterogenous actor groups in competition for attention and recognition, diverging underlying assumptions are commonly used for strategic demarcation and rarely considered as a source for empowering collaboration.

In my PhD research, I explore opportunities and potentials for fruitful collaboration between and across diverging perspectives and approaches. My case studies include both current everyday practices, initiatives to bring about change towards sustainable consumption more narrowly, for example on the level of individual households and communities, and initiatives aimed at broader societal change. Amongst other, social practice theories as well as insights from psychology are brought to bear on household food consumption, and research on discursive practices provides insights into the emergence, maintenance and role of narratives of change in transformative social innovation initiatives.

The diversity in conceptual approaches and empirical material enables an exploration of several avenues for conceptual cross-overs as well as more integrative approaches in policy and practice. Recognising the politisation of science (Stirling, 2010) and the epistemisation of the political (Bogner, 2021), my research thus invites a more reflexive approach to the mobilisation of specific conceptual approaches and calls for an increased diversity in theories and perspectives in research, policy and practice. In view of the power of premises, diversity in concepts and strategies seems key in achieving meaningful, sustainable change.

References

- Bogner, A. (2021). *Die Epistemisierung des Politischen. Wie die Macht des Wissens die Demokratie gefährdet*. Stuttgart: Reclam.
- Stirling, (A. (2019). Keep it complex. *Nature* 468, 1029-1031.

From sufficiency to sustainable abundance: dispelling a myth

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The Paris Agreement sets the goal of a complete global phase-out of fossil fuel use by the end of the 21st century and an 80-95% reduction of carbon emissions in affluent countries by 2050. Obviously, efficiency gains alone cannot deliver the required reductions (Alfredsson et al., 2018), due to rebound effects (York et al., 2022) and the increasing pace of growth (Hickel, 2020). It is suggested that efficiency improvements need to be accompanied by demand-side innovations and more specifically by sufficiency-oriented efforts, i.e., “doing with less” - reducing the absolute amounts of resources and emissions associated with modern lifestyles (Wiedmann et al., 2020). However, discourses about limits to consumption are often met with resistance from almost all stakeholders (Gumbert et al., 2022). Individuals associate sufficiency with “leaving in caves” (Mont et al., 2013). For businesses, sufficiency often challenges the entire business logic of growth and profit maximisation (Bocken & Short, 2016). Policymakers are reluctant to engage with sufficiency for fear of losing their electorates as sufficiency is often viewed as a too radical and contested idea. Thus, a paradoxical situation emerges: the need for a radical transformation of our economy has finally been agreed upon in international agreements, yet necessary measures for enabling radical transformations are seen as too radical. These views and narratives not only help maintain the growth-dependent economy that no longer fits within planetary boundaries, but they also influence what our societies deem possible and desirable (Jackson, 2006).

The question we would like to explore in this contribution is How can we dispel these dominant narratives in society that prevent us from considering sufficiency as a salient part of sustainability governance? How the contested notion of sufficiency can be operationalised and implemented in practice by various stakeholders: individuals, businesses and policymakers to enable sustainable abundance?

Sufficiency is often seen as a reversal of progress with fewer material possessions and fewer activities with high energy consumption, which would result in less fun, less convenience and a lower standard of living. The myth originates in the understanding that higher levels of material wealth lead to higher happiness and well-being. The result is a reluctance to address consumption-related resource use and impacts and weakness of policy instruments that aim to improve consumption patterns merely by greening markets. However, if nothing is done about unsustainable consumption patterns and especially levels, more and more people in the world will be condemned to living with severely reduced standards of living. In this contribution, we dispel this myth and explore and contrast the views of different stakeholders about sufficiency.

D02: Safe Access to Nutritious Food: Global Perspectives

Session Chair: Sake Kruk, tbc

Room: B: Omnia, R: Quantum 1 (max. 30)

A safe and just space for the nutrition sector, a global assessment

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This work performs a global assessment of the socio-ecological efficiency of nutrition provisioning systems, measuring performance across nations. The goal is to interpret what features of the nutrition provisioning lead to greater socio-ecological efficiency, where this measurement is determined using an environmental index of ecological overshoot through a consumption lens and a social index measuring social foundation achievement. The findings are likely to show (study in progress) that developed countries see significant overshoot but see greater accessibility and affordability for food sources, while developing countries potentially exist in the planetary boundaries but struggle to attain high social foundation achievement. The value of this work is its ability to connect ecological and social issues and interpret how close global nutrition systems are to entering a 'safe and just' space.

Vulnerability of older people in the context of food purchase during the COVID-19 pandemic

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An aging society marks the population projections. The older people group is in evidence and can be considered potentially vulnerable as a customer. However, studies on the subject are scarce, especially if the focus is on the impotence experienced by the elderly during an interaction with food products. Therefore, this research aims to analyze the vulnerability of older people in the context of food purchases and their lifestyle changes during the COVID-19 pandemic. For this, we conducted 17 semi-structured interviews via telephone with people aged 60 or over, food buyers in person, identified as independent. They informed their interest in participating in the research through a preliminary questionnaire administered to potential participants. After data collection completion, a content analysis involved coding and categorization of data. Among the results, the olfactory decline related to biological aging contributes to vulnerability, making older people more susceptible to physical harm from food poisoning. The decrease in vision makes food product packaging with non-contrasting colors an impediment for the elderly to achieve their purchase targets. Due to psychological aging, spatial orientation can be impaired, generating frustrations in locating and accessing food products. The deficit in information processing is also one way to contribute to vulnerability because food labels are displayed to compromise understanding, making older people feel deceived. Moreover, a cognitive reserve slightly below did not reflect in the statements that psychological aging stands out as a source of vulnerability. Social aging makes older people feel excluded for not taking advantage of the family-size supply imposed by the market. As an external condition, the inadequacy of the supermarket's physical and logistical elements increases older people's susceptibility to accidents during food shopping. Finally, the COVID-19 pandemic revealed the experiences of vulnerability during experimentation with alternative methods to face-to-face buying and the lack of access to them (i.e., food delivery apps such as GrubHub, Just Eat, and iFood). As a contribution, the present research offers visibility to this neglected elderly public. We propose an empirical model to be tested and exploitable opportunities for companies interested in mitigating future vulnerability experiences by providing more sustainable buying environments to the elderly.

Effects of the Covid-19 crisis on household food consumption and child nutrition in Mozambique.

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The study investigates the short-term impacts of an aggregate socioeconomic shock on household food consumption and children's nutrition using the case of the Covid-19 pandemic in Mozambique. In response to the economic downturn, households are expected to adjust their food choices both in terms of food quality towards cheaper and unhealthier food and in terms of quantity, reducing diet diversification and increasing the exposure to malnutrition, mainly of children. Empirical evidence on such immediate effects is still scarce, mainly due to a lack of data. Relying on household survey data from 2019/2020, which includes a detailed consumption module and anthropometric measures for under-5 children, this paper aims to fill the evidence gap. We use a cross-sectional econometric analysis to look at the variation in household food consumption and child nutrition before and after the pandemic. We perform a heterogeneity analysis to understand which factors are associated with a greater likelihood of being worse off from the crisis. We run a quantile regression to look at the effect along the entire distribution. Finally, we conduct a mediation analysis to investigate the mediating effect the household food environment plays on child nutrition. We gained five major insights. First, food consumption in quantity (monetary and caloric) declined in response to government restrictions and associated economic effects, but only later in the year. Food diversity instead reduced to a lesser extent. Second, measures of Covid-19 case prevalence are not associated with these outcomes. The economic consequences of the crisis were mainly driven by government restrictions and their level of enforcement, rather than by the health impact of the pandemic. Third, stunting increased in response to government restrictions and associated economic effects. The high pre-pandemic prevalence of stunting suggests that many Mozambican children were at risk, which the shock then triggered and pushed them over the threshold. Fourth, heterogeneity analysis shows that the food intake reduction was concentrated in the South of the country, and households who practiced subsistence agriculture were able to buffer some of the negative effects. The absolute effect was smaller for the poorer population. This is also confirmed in the results from the quantile regressions. Fifth, child malnourishment was concentrated among newborn children. The results further suggest a redistribution of food among children within a household to the benefit of the firstborn child. The robustness checks suggest that the real effect is potentially underestimated, although, when correcting for multiple hypothesis testing, it loses significance except for stunting. The sensitivity analysis confirms that the findings persist even when excluding the provinces of Cabo Delgado and Maputo City. The contribution of this study is threefold. First, it uses primary data collected through face-to-face interviews. Second, this analysis validates some of the estimates early made in other studies based on simulation exercises. Third, it sheds light on the impact of the Covid-19 crisis in Mozambique.

D03: Digital Technologies for Circularity and Sustainability

Session Chair: Kira Matus

Room: B: Omnia, R: Quantum 4 (max. 30)

Overcoming Challenges in Transitioning from a Linear to a Circular Approach for Small Medical Devices; A Case Study of Diabetes Care Devices

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Problem Statement: Approximately 537 million adults worldwide are living with diabetes, projected to rise to 783 million by 2045. Developments in technology over the last twenty years have significantly assisted in managing the condition and improving patients' quality of life but are also contributing to the growing volume of waste from electrical and electronic equipment (WEEE). Monitoring and managing the condition is supported by a multitude of diabetes care and technology products and technologies including self-monitoring and continuous blood glucose monitoring devices, insulin pumps, insulin syringes and single-use insulin pens, all deployed using the classical linear economy approach. Continuous Glucose Monitors are of particular interest due to the incorporation of electronics and a lithium battery, and their single-use nature with a need to be changed every 3 to 7 days, leading to an individual person consuming between 50 and 120 devices per year.

Research Questions/Aims: Challenges with the circular management of small electronic devices are typically characterised by difficulties in collection as part of a coherent waste stream, inappropriate pre-treatment, and poor recycling outcomes. Meanwhile, amongst other things, circular business strategies will typically address these challenges by creating 1) dedicated return channels and 2) value-retaining treatment approaches such as device re-manufacturing, component reuse or material recycling. This work aims to provide insight and recommendations on how these might be achieved.

Methods: This cross-disciplinary study combines

- consumer research on diabetes type 1 patients and carers' practices and attitudes towards the use and disposal of diabetes devices and
- engineering research on the potential for automated end of use treatment of these devices for circularity

Findings: Consumer research was conducted in 2 phases. First, exploratory research was based on the analysis of an online survey and 15 in-depth interviews conducted with people living with type 1 diabetes in Ireland, between April and June 2022. The survey resulted in 89 usable

responses giving descriptive information regarding the type of diabetes, products used to manage care, user experience and disposition, and recycling behaviours. The second phase followed a pharmacy pilot takeback scheme run from September to November 2022. The research used on-site observations and follow-up interviews research with both users of wearable technology and participating pharmacists.

Participants' accounts highlight that living with Type 1 diabetes has a profound impact on people's life and requires them to plan their activities and time meticulously to monitor and manage their blood sugar levels. Consequently, they have become experts not only in the management of their condition but in the management and use of different diabetes care systems. The disposition and recycling of diabetes care devices were of some concern for participants. All were aware of the amount of waste associated with these devices with many highlighting that the levels of paper, cardboard, and plastic in the packaging were excessive. Some devices require complex delivery systems which also generate additional packaging and there was some concern regarding what to do with used devices. Consequently, participants felt that manufacturers must take greater responsibility for the appropriate disposal of waste and that the engagement of users must be made as easy and convenient as possible. Participants indicated the need for a convenient take-back solution. Both users' and pharmacies' experience of the take-back pilot scheme was very positive, and members of the diabetes community indicated a keen interest in recycling their devices and availing of a convenient take-back option. Continuous glucose monitoring devices were also examined for their potential for automated treatment to separate components and materials for reuse or recycling. The single largest challenge identified was the ability to open the case of the device which are hermetically sealed for robustness and to prevent users from dismantling them. The current product design therefore is only suitable for shredding which leads to very poor recycling outcomes and creates a fire hazard due to the presence of the lithium battery.

Conclusions: A dedicated take-back system for collecting devices has a high potential to be successful due to the motivation of users and service providers but current device designs present significant challenges at end of use.

Practical and Scientific Conclusions: Recommendations include reducing packaging where possible, offering both single and multipack insulin pens, improving labelling of hazardous and recyclable elements, incorporating training in the proper disposal with the training given to users by manufacturers, encouraging returns of materials that can be recycled/re-manufactured through collection/drop-off systems, and a device (re)design which facilitates automated reuse/recycling rather than obsolescence.

Assessing the sustainability of a digital eco-innovation

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"ICT can enable a 20% reduction of global CO₂e emissions by 2030, holding emissions at 2015 levels.", according to GeSI (2015). Simultaneously Gary Dickerson, CEO of Applied Materials, warned that processes of artificial intelligence (AI) could use ten percent of the global energy consumption in 2025 (Daum 2020). Those two statements reflect, that the impact of digitalisation on sustainable development - whether it is mere a blessing or a curse - is widely under discussion and needs to be investigated. Discussed opportunities of digitalisation are, among others, advances in resource and energy efficiency, dematerialisation, knowledge generation through combining data or new forms of political participation. Special attention grows concerning digital eco-innovations, i.e. digital innovations which aim at unfolding a positive environmental impact or result (unintend-edly) in a positive environmental impact. However, it needs to be assessed if and under which conditions the associated environmental benefit of a digital eco-innovation holds. Such an as-sessment always requires a use case scenario, as environmental and economic benefits are co-produced by the behaviour of all actors in an economy and boundary conditions. In addition, it is very important to identify and assess further impacts and arising trade-offs. Finally, it is possible to decide if and under which conditions the use of a specific digital eco-innovation is (overall) sus-tainable.

One specific digital eco-innovation will be assessed in a case study in the area of artificial intelligence (AI) - based sorting, in order to investigate promises of AI in fostering a Circular Economy. At least two application scenarios (use of the digital eco-innovation vs. business-as-usual scenario) will be developed. It is planned to investigate the whole life-cycle of the digital eco-innovation with a focus on the use phase. The system boundaries of the scenarios must be defined as well as a profound procedure for identifying the considered impacts of the digital eco-innovation. To gain information on the environmental benefit of the digital eco-innovation, interviews will be conduct-ed with producers and users. Thereby it is possible to estimate the impact of one digital eco-innovation. Furthermore, with information on potential market shares etc. it is possible to derive the potential impact for a whole region and a specific sector. In order to examine the sustainability of the digital eco-innovation, the developed scenarios will be assessed using a sustainability as-sessment framework. This framework operationalizes the seventeen Sustainable Development Goals and digitization-specific indicators for assessing innovations. It is based on existing ap-proaches regarding SDG integration and assessing digital technologies. The results of the case study provide information on the conditions under which the use of the investigated digital eco-innovation is sustainable.

Daum, Timo (2020): Missing Link: Künstliche Intelligenz und Nachhaltigkeit – und ewig grüßt der Rebound-Effekt. Available online, checked on 7/23/2020.

GeSI (2015): #SMARTer2030. ICT Solutions for 21st Century Challenges.

Digital technologies for a circular economy: Mapping sectoral applications and their environmental, social and economic impact

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Digital technologies – like the Internet of Things (IoT), big data analytics, blockchain, additive manufacturing and 3D printing – are considered key enablers for a circular economy (CE). A growing body of academic literature is thus investigating how digital technologies facilitate the implementation of CE strategies and business models, especially in the manufacturing sector (Bressanelli et al., 2022). These studies often highlight potential benefits for individual (frontrunner) firms (Schöggl et al., 2022), but fail to provide a comprehensive analysis of the environmental, social and economic effects of a digital CE. This significantly limits our understanding of the positive vs negative sustainability impact of a digitally-enabled CE, and leaves possible sectoral differences virtually unexplored.

To address this knowledge gap, this paper investigates how the environmental, social and economic effects of a digital CE vary across industrial sectors. The study is based on a systematic literature review of scientific papers (articles and reviews) written in English, published in the past four years (2019-June 2022), and available in the Scopus database. In the keyword-based search (TITLE-ABS) the term 'circular economy' was used in combination with terms related to impact (impact, effect) and a broad set of digital technologies. The search string generated 278 documents, whose titles and abstracts were screened for eligibility. Of the 81 papers retained for the full-text review, 45 were included in the final analysis and classified based on their general information (e.g. author(s), year of publication, journal), content (e.g. CE strategy, digital technology, impact category/type, type of study) and context (e.g. sector, geographical scope).

The analysis shows that most publications (44%) describe some form of sustainability impact resulting from a digitally-enabled CE in the manufacturing sector (with applications e.g. in the areas of textiles, food, transportation equipment, electrical and electronic products). Less than a third of the articles analysed (29%) address other sectors (e.g. construction, transport, waste management), whereas the remaining ones (27%) do not specify or combine multiple sectors. The IoT and data analytics are the most applied digital technologies across sectors, except for tourism and transport where online platforms are used more frequently. Remarkably, the vast majority of papers report on expected sustainability impact; only 10 articles empirically measure environmental, social and/or economic effects, or cite hard evidence from other studies.

Environmental benefits are the most frequently identified (96% of the articles), followed by economic (64%) and social (60%) impact. For most sectors both positive and negative effects are acknowledged; yet, environmental rebound effects are anticipated primarily in the manufacturing sector, where increased productivity is expected to lower costs and foster additional consumption.

This study offers novel insights on the application and sustainability impact of a digital CE. Since some sectors are examined only by few articles (e.g. retail, construction, financial services, tourism), it is difficult to draw generalisable conclusions on sectoral differences. More (empirical) research is urgently needed to assess the effects of a digitally-enabled CE in the manufacturing sector and beyond.

Are blockchain sustainability solutions profitable?

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Abstract not included at the request of the authors.

Digital platforms in the food consumer journey: The challenge to prevent food waste

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Introduction. Different initiatives orientated to achieve SDG 12, and, mainly target 12.3 to cut half per capita global food waste by 2030, have been globally and locally proposed (e.g., the International Day of Awareness of Food Loss and Waste, The Dialogue Forum for Food Waste Reduction of different sectors in Germany, etc.). The introduction of digital platforms in this domain has been recently introduced making it a potential subject of study to be explored. With a focus on the consumer level mind and the complex journey that the consumers are involved in regarding food choices (i.e., planning, provision, preparation, cooking, etc.) in this work we set out to understand the potential and constraints of digitalisation to prevent food waste.

Method. We initially mapped the digital platforms that consumers may use during their food journey. We then conducted a qualitative study of 17 semi-structured interviews. Three interview guides were developed: for specialists from the Academia or governmental or non-governmental organizations, for specialists of digital platforms against food waste, and users of these tools. Content analysis was used to analyse the vision of the experts and the users, particularly, users from the digital platform Too Good to Go. Most of the research was centred in Germany. However, some initial data from Argentina's specialists was obtained to have an additional perspective on the topic.

Results. We identified a series of digital tools for each moment of the consumer food journey. The majority of the respondents agreed that all the stages are important to avoid food waste. Still, they highlighted that planning, understood as the capacity to organise ahead our meals and learning the quantities of how much to buy has a key potential to prevent food waste. Another key stage that emerged from the discussion was the conjugation of knowledge and creativity while preparing food. For these moments of the journey, mobile apps introduce a calendar to add a recipe each day or match home ingredients with recipes. In another line of analysis, it is striking how consumers are using digital platforms as food providers. One of the most well-known platforms in Germany (and in Europe in general) related to food waste in the retail sector (restaurants and shops) but used by consumers is Too Good to Go. Although our respondents have an environmental profile, saving money is the main motivation to use the mobile app. Living in small areas, not being young and being aware of the transfer of responsibility for food waste from the retailer to the consumer are discouraging aspects of using it.

Conclusions. Our study can be both a tool for consumers, as it provides knowledge of the digital platforms that can facilitate their food journey and thus the prevention of food waste, and it also allows us to reflect on future lines of research due to the particular vision of the experts and the users in the topic.

D04: Sustainable Consumption Communication: Discourse Perspectives (3/3)

Session Chair: Daniel Fischer

Room: B: Omnia, R: Quantum 2 (max. 30)

All well and good: Coupling ecological sustainability with health and transparency in the new Nordic Nutrition Recommendations (NNR)

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Authorities and organisations in several sectors and countries seek to integrate the objective of better public health with ecological sustainability. This entails intricate selection processes, priorities, and trade-offs deliberated and disputed between experts from the sectors and countries involved.

This paper aims to analyse framing processes in which food experts - in open consultation procedures with society – deal with the challenge of designing food recommendations that reconcile the goals of better public health and the environment.

Previous research on framing trade-offs and synergies for sustainability in the food sector has mainly examined the relationship between ecology and economic interests and between ecology and that part of sustainable development that deals with tensions between different ecological factors. Far less explored are negotiation processes between scientific experts to reconcile dietary recommendations that optimise ecological sustainability as well as the health of food.

To analyse this, the paper uses framing theory, specifically how different actors frame the distinct goals of ecological sustainability and health. After attempting to illustrate the processes using the ideas of strategic frame extension and alignment, I show how a more profound understanding requires us to move beyond the linear and deliberately strategic reframing that these terms suggest. To do this, I recommend two that one needs to recognise more implicit and unconscious reframings, which I call frame repositioning and resizing. The paper uses these terms to explore how the environmental and health aspects of food and diets are simplified, complicated, categorised and relativised in open, scientific processes.

Empirically, I analyse an ongoing programme, Nordic Nutrition Recommendations (NNR). There, food experts from the Nordic countries in the fields of environment and health collaborate for a year and develop food recommendations that are also preceded by feedback from NGOs, the food industry, the public and external researchers.

The empirical material in this paper consists of in-depth interviews with experts and national representatives within NNR, an analysis of documents developed within and around the NNR process and an analysis of recorded and filmed open meetings with NNR.

The degree of complexity increases quite dramatically when the already multifaceted factors of environment and health are to be reconciled. Political, economic and cultural factors and interests are woven into the fabric and become an integral part of the deliberations between these experts on ecology and health, respectively. For example, this applies to Sweden's tradition of pasture and open landscapes, Norway's minimal geographical possibilities to grow crops other than for animal feed, Denmark's strong tradition of pork production and Finland's

relatively vigorous vegan movement. The paper identifies current and potential ways to reframe differences into simplified recommendations of food consumption promoted as both healthy and sustainable.

Motivating costly proenvironmental behaviour by activating positive emotions in Ghana and the Philippines

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Showing support for environmental topics and projects on social media is arguably easier and less costly for an individual than donating money to an environmental cause, thus foregoing additional income. Previous research has shown that middle class individuals in middle income countries such as Ghana and the Philippines have good environmental awareness and tend to perform easy, low cost proenvironmental behaviours. It is an open question how to motivate more costly proenvironmental behaviours in these income strata that have moved out of poverty. Recent psychological research argues that the activation of positive emotions can present a powerful lever to initiate climate change action. We run survey experiments with 800 middle class individuals in Ghana and the Philippines and test the influence of emotional recall (treatment) on social media clicks and donations to a local environmental NGO. Participants received an endowment and chose which amount to keep for themselves and how much to donate to a local environmental NGO, thus activating a mental gain/loss mechanism. First results indicate that the recall of past positive emotions when performing proenvironmental behaviours increases the amount of donations in the Philippines, but not in Ghana. Differences in valuing environmental vs. social policy and project support may be the reasons for these results.

Social media, the youth and sustainable consumption: Can social media influencers stimulate sustainable consumption patterns?

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Social media, the youth and sustainable consumption: Can social media influencers stimulate sustainable consumption patterns?

The consumption of social media among the youth is widespread. The majority of social media is consumed passively, by watching or liking posts. However, the consumption of social media also results in buying products that are promoted by social media influencers. A specific form of social media content is created by 'social media influencers', who are paid to promote products as well as certain lifestyles. This is often portrayed as a risk, as this negatively affects adolescents' purchasing behaviour and well-being. However, the power of social media influencers might also have a positive effect on the consumption patterns of adolescents.

In this paper, we explore the possibilities of social media influencers as a means to communicate sustainable consumption, sufficiency and resilience, by addressing the following questions: What is the influence of social media on the consumption patterns of the youth? Can social media influencers support notions of sufficiency, and direct toward more sustainable consumption patterns? These questions are addressed based on a questionnaire study among 14-18 year-olds, supported with qualitative, semi-structured interviews with adolescents and experts.

First results of our study show that advertising is not always recognized as such. This also holds for sustainability items; our respondents question whether content on sustainability is authentic, or is only used as a marketing tool. An important finding is the strong influence of the social environment on the conveying of ideas and the decision to buy products. Hence, views communicated by social media influencers that are in accordance with views of peers, are more likely to set ground. The innovative research focus on social media influencers and their impact on (un-)sustainable consumption of the youth will lead to recommendations on how to increase resilience of adolescents, by reducing malconsumption and supporting more sustainable consumption patterns.

The project is supported by funds of the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) based on a decision of the Parliament of the Federal Republic of Germany via the Federal Office for Agriculture and Food (BLE) under the innovation support programme.

Discursive struggles over pesticide legitimacy in Switzerland: A news media analysis using topic modelling and discourse analysis

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Agricultural pesticide use and its reduction pathways are highly contested. Driven by societal concerns about the negative effects of pesticides on the environment and human health, struggles over the legitimacy of pesticides have strongly increased. These struggles take place in the public discursive spaces of the transition. The actors engaging in the discursive struggles seek to create or undermine pesticide legitimacy, which in turn can determine the pace and direction of policy change. So far, it remains underexplored how current discursive struggles over pesticides and their legitimacy unfold in detail, and how these discourses link to policy changes and regime de- or restabilization. Therefore, deepening our understanding of the discourses in the news media as a central arena of policy debates helps to take these essential parts of the picture into account.

Three research questions orient the study: 1) what are the prominent topics in the newspaper coverage of pesticides over time; (2) which storylines are presented, and which actors mobilize them to (de)legitimize pesticide use; and (3) what implications does the discursive (de)legitimization present for the pathways towards low-pesticide agriculture and the associated regime de- or restabilization?

Conceptually, the paper builds on the vast literature on sustainability transitions. It examines the discursive dynamics surrounding pesticides through the lens of technology legitimacy.

Empirically, the research questions are investigated with a study on the discourses surrounding pesticides in Switzerland. Switzerland is a highly relevant empirical case for at least two reasons. First, the country has recently seen an extremely controversial and even more pronounced societal debate about pesticides than most other European countries. This debate has led to two popular initiatives that proposed stricter pesticide regulation including, in one case, a ban of all pesticides. Second, despite being rejected by the Swiss people at the voting poll, the initiatives have left strong impacts in many areas of the agricultural sector, including policies, business and farming practices.

Based on a large corpus of 2,523 newspaper articles in German and covering two broad print media landscapes (mainstream and farming press), the paper tracks the public discourses about issues arising from the prevalent use of pesticides over roughly 11 years (from 2011 to early 2022). It uses a mixed-methods approach consisting of structural topic modelling (for distant-reading) and argumentative discourse analysis (for close-reading).

The article will make three contributions. First, by systematically identifying the topics associated with pesticides, the key storylines and the discourse coalitions, the study offers a nuanced understanding of pesticide discourses in Switzerland. Second, examining the interplay between discourse and policymaking yields implications for the governance of a low-pesticide transition. The implications will be relevant beyond the Swiss case for other countries in Europe as they strive to reduce pesticide use and transition to a more sustainable agricultural production Third, the article enriches the methodological repertoire in transition studies by illustrating the combined application of text mining for analyzing a large dataset and an in-depth argumentative discourse analysis.

D05: Disruptions in everyday life: Changing social practices & opportunities for sustainable consumption (1/2)

Session Chair: Claire Hoolohan
Room: B: Orion, R: B3031 (max. 52)

Practicing sustainable consumption during a pandemic: A longitudinal study of disruption and everyday practices

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This paper studies changes in consumption during the Covid-19 pandemic and brings unique new knowledge on the effects of disruption on everyday practices by drawing on longitudinal qualitative interviews with households on their experiences with lockdown. Although large-scale disruptions have a proven potential to cause societal change (Markard and Rosenbloom 2020), the overall positive effects on environmental pressures of the COVID-19 pandemic have been modest, unevenly distributed, and most likely temporary (e.g., Lehmann et al. 2021). Particularly during the beginning of the pandemic, narratives of a 'window of opportunity' for sustainability transitions abounded – proposing that the pandemic could spark positive change towards different ways of life and more sustainable production systems and consumption patterns globally (e.g. Cohen 2020). However, the sustainability implications of the pandemic remain hugely ambiguous (Lehmann et al. 2021). In terms of consumption, recent research has shown how lockdowns forged new practices and discourses, sparking reflection, experimentation and imaginations for future modes of living and consuming in households across the world (Greene et al. 2022; Hoolohan et al 2022). However, research has also revealed how various unsustainable consumption patterns are maintained, reinforced and accelerated as different actors have sought to adapt to a 'new normal' of the pandemic (e.g., Holmes et al. 2021). While the pandemic certainly has changed the dynamics of consumption – for example, by forging new or stronger links between consumers and businesses through the massive upsurge of online platforms and delivery services – we need more knowledge on the long-term effects of pandemic adaptations on consumption patterns. This paper contributes to meeting this knowledge gap by drawing on longitudinal qualitative interviews with households in Oslo, Dublin and Hanoi, from spring 2020 through summer 2022. In doing so, we advance on previous research on everyday life during the pandemic, the majority of which has focused on a single period of the pandemic. The Covid-19 pandemic provides a unique opportunity to explore dynamics of social change amid large-scale disruption, e.g. how routines and habits are broken and remade, and how a 'new normal' is forged through the intersections of practices, provision and policies. Zooming in on the realms of food, mobility and

housing, this paper seeks to understand how consumption patterns are shaped by processes of adaptation, acceleration and normalization across households, businesses and policy makers. We focus on how households have adapted to disruption and how social processes and business strategies have affected these adaptations. Furthermore, we consider how systems of provision have contributed to accelerating changes in some cases and shaped the return to previous practices in other. Finally, we consider how these processes together have shaped normalization of specific patterns of consumption in the post-lockdown new normality.

Can people talk about their past practice? Challenges and opportunities for biographic research on consumption

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Within the social sciences, there is increasing interest in the application of theories of practice for understanding resource consumption and for pursuing sustainability goals. In stressing the routine, performative, and contextual dimensions of action, research on geographies of practice is faced with particular methodological challenges. A lively debate concerns the utility of talk-based methods for investigating routine practices, such as those relating to everyday consumption. While it has been compellingly argued that people can talk individually or in groups about their practice, as of yet, these methodological debates have not been extended to the question of whether people can talk about past practices over the life course. This is despite the fact that attending to practice dynamics at the life-course scale can reveal important insights into the intersections of structure, agency, time, and space in consumption practices. Seeking to address this gap, this methodology-focused paper explores biographic inquiry as an empirical strategy for research on geographies of practice and consumption. After identifying significant challenges in representation associated with researching routine action in general, and past practices in particular, it outlines key learnings garnered during a biographic study on domestic consumption in Ireland. Central methodological features supporting talk-elicitation include zooming-in-and-out of temporal registers, multi-modality, and phased implementation. The paper concludes that people can talk about past practices in often very detailed, intricate ways and that retrospective talk is a valuable tool for understanding practice dynamics at the life-course scale.

Changing daily habits during the COVID-19 crisis – Insights from the longitudinal diary study “Logbook of Changes”

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Presenter: Bettina König, Benjamin Nölting (in person)

Very early in the COVID-19 pandemic scholars discussed, whether it could be seen as a global landscape event potentially fostering deep transitions and providing a window of opportunity to combine climate and other sustainability related policies with measures to overcome the COVID-19 pandemic (Schot 2020). While individuals and society still need to handle it, an armed conflict has been a second fundamental crisis reaching into people's everyday lives. Different research communities gained interest in the disruptive character of such crises not at least in comparison to planetary crises of climate change, biodiversity loss etc. (Kanda and Kivimaa 2020, Vinke et al. 2020). However, empirical insights on (sustainability) change and innovation “in-the making” and disruptive change so far were meager (e.g. Köhler et al. 2019, Klitkou et al. 2021, Schaefer et al. 2021, Kivimaa et al. 2021).

It is the aim of the citizen science project “Logbook of Changes” to document changes in daily life due to COVID-19. It is an ongoing longitudinal qualitative diary study run since March 2020 at Eberswalde University for Sustainable Development (www.logbuch-der-veraenderungen.org, König et al. 2022). Citizen scientists document their observations of changes in daily life due to the COVID-19 pandemic in the fields of mobility, work, shopping and provision, family and leisure, care, information and communication. They can add other observations and document an overall assessment of the situation. Until December 2021 more than 600 logbook writers had written 1.395 logbook entries. Through a reminder reaching about 200 logbook writers and press work, we are still able to extend the rich and unique data base for studying daily life changes. Our analysis took a social practice perspective thus embedding daily life routines in a societal context.

Although the dataset is not representative, it allows to reconstruct about 30 changed practices and practice bundles during the pandemic in detail (Gutsohn et al. 2022a, 2022b). Also, secondary effects of changed practices were analyzed, e.g. the impact of outdoor activities on human-nature connection.

Yet, in the public discourse handling the pandemic and reflecting the lessons learnt seems in the first place as a matter of experts (e.g. International Science Council 2022, Deutscher Ethikrat 2022, Nölting et al. 2022, Renn et al. 2022). The perspectives of citizens are missing, although experts agree that this disruptive event affects them in the first place.

Against this background, we present results of a co-interpretation phase of the “Logbook of changes”. We will discuss and co-interpret the empirical results of interconnected practices (living together, being mobile, communication) with logbook writers in three online workshops. Together we discuss which practices should be maintained from a sustainability transformation perspective and how further social innovations can support to maintain those practices. In our presentation, we discuss the potential and limitations of data collection with longitudinal diary studies and the methodological design for a co-interpretation phase in a citizen science approach.

Deutscher Ethikrat (2022). Vulnerabilität und Resilienz in der Krise – Ethische Kriterien für Entscheidungen in einer Pandemie. Stellungnahme, 4.4.2022, <https://www.ethikrat.org/fileadmin/Publikationen/Stellungnahmen/deutsch/stellungnahme-vulnerabilitaet-und-resilienz-in-der-krise.pdf>

Gutsohn A, Selleneit T, König B, Nölting B (2022a). Solidarität und solidarisches Verhalten in der Corona-Pandemie. Ergebnisse aus dem ""Logbuch der Veränderungen"". Eberswalde: Hochschule für nachhaltige Entwicklung Eberswalde (Diskussionspapier-Reihe Nachhaltigkeitstransformation & Nachhaltigkeitstransfer, Nr. 04/22). <https://doi.org/10.57741/opus4-360>

Gutsohn A, Wiemers H, König B, Nölting B (2022b). Information, Kommunikation und die Entwicklung digitaler Kompetenzen in der Corona-Pandemie. Ergebnisse aus dem „Logbuch der Veränderungen“. November 2022. Eberswalde: Hochschule für nachhaltige Entwicklung Eberswalde (Diskussionspapier-Reihe Nachhaltigkeitstransformation & Nachhaltigkeitstransfer, Nr. 5/22). <https://doi.org/10.57741/opus4-368>

International Science Council (2022). Unprecedented & Unfinished: COVID-19 and Implications for National and Global Policy. Paris, France, International Science Council. DOI:

10.24948/2022.03. <https://council.science/publications/covid19-unprecedented-and-unfinished>

Kivimaa P, Laakso S, Lonkila A, Kaljonen M (2021). Moving beyond disruptive innovation: A review of disruption in sustainability transitions, *Environmental Innovation and Societal Transitions*, vol. 38, pp. 110-126, <https://doi.org/10.1016/j.eist.2020.12.001>.

Klitkou A, Bolwig S, Huber A, Ingeborgrud L, Pluciński P, Rohrer H, Scharfing D, Thieme M, Žuk P (2022). The interconnected dynamics of social practices and their implications for transformative change: A review, *Sustainable Production and Consumption*, vol. 31, pp. 603-614. <https://doi.org/10.1016/j.spc.2022.03.027>

Köhler, J, Geels FG, Kern F, Markard J, Wieczorek A, Alkemade F, Avelino F, Bergek A, Boonsi F, Fünfschilling L, Hess D, Holtz G, Hyysalo S, Jenkins K, Kivimaa P, Martiskainen M, McMeekin A, Mühlemeier MS, Nykvist B, Onsongo E, Pel B, Raven R, Rohrer H, Sandén B, Schot J, Sovacool B, Turnheim B, Welch D, Wells P (2019). An agenda for sustainability transitions research: State of the art and future directions. *Environmental Innovation and Societal Transitions*, Volume 31, Pages 1-32, <https://doi.org/10.1016/j.eist.2019.01.004>

König B, Nölting B, Crewett W, Demele U (2022). Methode und Meta-Daten zur bürgerwissenschaftlichen Studie ""Logbuch der Veränderungen"". Eberswalde: Hochschule für nachhaltige Entwicklung Eberswalde (Diskussionspapier-Reihe Nachhaltigkeitstransformation & Nachhaltigkeitstransfer, Nr. 03/22). <https://doi.org/10.57741/opus4-277>

Nölting B, König B, Zimmermann AB, Di Giulio A, Schäfer M, Schneider F (2022). Dealing with the COVID-19 pandemic: an opportunity to reflect on sustainability research. In: *NachhaltigkeitsManagementForum (Special Issue Sustainability and Adaptation: Navigating COVID-19)*. <https://doi.org/10.1007/s00550-022-00528-w>

Renn O, Engels A, Mack B, Becker S, Camier C (2022). Will short-term behavior changes during the COVID-19 crisis evolve into low-carbon practices? *GAIA* 31/3 (2022): 158–166.

Schot J (2020). Interpreting COVID-19 through the lens of the second Deep Transition. 2020 as turning point in history. *Ökologisches Wirtschaften* 3(35): 19-21

Schaefer KJ, Tuitjer L, Levin-Keitel M (2021). Transport disrupted - Substituting public transport by bike or car under Covid 19. *Transportation Research Part A: Policy and Practice* 153: 202–217.

Sovacool BK, Hess DJ (2017). Ordering theories: Typologies and conceptual frameworks for sociotechnical change. *Social studies of science* 47/5: 703–750.

Vinke K, Gabrysch S, Paoletti E, Rockström J, Schellnhuber H J (2020) Corona and the climate: a comparison of two emergencies. *Global Sustainability* 3, e25: 1–7. <https://doi.org/10.1017/sus.2020.20>

Reducing consumption together: sustainable practice interventions in Australian collaborative housing communities

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It's widely understood that human society is currently on an unsustainable trajectory. Reducing the environmental impacts of household consumption has been cited as a key way to rapidly shift this trajectory (Newton 2011). Researching households that have made committed changes to their lifestyles to live in a more sustainable manner can help inform efforts to make this shift. Collaborative housing communities, such as ecovillages and cohousing communities, represent physical and social innovations that can provide exemplars of committed sustainable living. Research shows some communities achieving significant reductions in household consumption (Daly 2017).

This paper uses theories of social practices and sustainable consumption to examine the sustainable practices which are enacted, and sustained in exemplar Australian collaborative housing communities, and explores the role of the community in catalysing and supporting sustainable interventions in household practices.

This paper draws from in-depth mixed-method research examining the sustainability practices of residents of two Australian collaborative housing communities. Data collection involved in-depth interviews, group discussions, participant observation, and collection of ecological footprint data.

The findings discuss some of the unique practices, and key elements of everyday household practices, present in these communities helping households adopt a wide range of pro-sustainability practices. These can be summarised as:

- Practices and elements that directly impact sustainability (e.g. renewable energy systems)
- Key elements that help to make sustainability practices distinct from mainstream practices (e.g. sharing values)
- Practices not directly related to sustainability, but fundamental to the success of the communities in achieving sustainability goals (e.g. community visioning, internal governance processes)

Using a social practice theory framework revealed the impacts of community-scale action on enabling the spread and endurance of sustainable practices, by increasing circulation and access to practice elements (materials, know-how and meanings) and allowing communities to intervene in the mainstream practice-as-entities to consciously and reflexively reduce the environmental impacts of household consumption.

Members of collaborative housing communities are engaging in small-scale experimentations in localised policy-making. There is much from analysis of their interventions in daily household consumption practices that can be used by policymakers to inform efforts to change/intervene in practices at different scales, such as households or neighbourhoods.

References:

- Newton, P. (2011) 'Consumption and Environmental Sustainability', in Newton, P. (ed.) Urban Consumption. Collingwood, Australia: CSIRO Publishing.
- Daly, M. (2017) 'Quantifying the environmental impact of ecovillages and cohousing communities: A systematic literature review', Local Environment: The International Journal of Justice and Sustainability. Taylor & Francis, 22(11), p. 1358–1377.

Prefiguration, performativity and everyday food futures

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Prefigurative practices bring into being, in the present, localised manifestations of hoped-for futures. The term is commonly applied to the structures and decision-making processes adopted by radical social movements, but also to more mundane aspects of movement activity like living arrangements and provisioning. This paper considers the merits of extending the notion of prefiguration further still, beyond consciously 'activist' action to the political content of 'ordinary' lives, more specifically to individual and collective attempts to reduce the ecological burden of those lives. Taking a performative view of everyday life suggests that our day-to-day doings and sayings make and remake social relations, discourses and ways of acting. We reproduce existing patterns and create subtly different patterns. From this perspective social change arises through ordinary people changing how they routinely think, talk and act. Could this understanding imbue mundane practices with radical potential as sites of 'ordinary prefigurative politics'? Does it risk endorsing an individualisation of responsibility for systemic problems, or celebrating a piecemeal 'lifestyle' activism, devoid of strategy and a coherent vision of the future? These questions are explored through reflection on two in-depth qualitative research projects, one focused on salvaging and repurposing surplus food, the other on transitions to plant-based and reduced meat diets.

D06: Attempting sustainable transformation through innovation in urban food systems: Cases from the UK.

Session Chair: Ulrike Ehgartner

Room: B: Omnia, R: Quantum 3 (max. 30)

Small-scale food system innovation as a driver of regenerative urban development: The indoor vertical farm Grow It York

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Urban indoor farming is of growing interest to entrepreneurial, public sector and civil society stakeholders alike, often tied to expectations for improvements in environmental sustainability and food security. We explore this food system innovation through Grow It York, an aeroponic vertical farm inside a shipping container, in SPARK*, a community interest company providing business incubation space in the city centre of York, UK. Set up and run by researchers the vertical farm is growing micro greens and salad crops indoors without soil, all year round and supplying hyper-local produce to the surrounding businesses and communities.

Focussing on Grow It York as a case study, three areas of innovation for sustainable production and consumption are discussed: (1) environmental innovation, (2) social innovation and (3) business model innovation.

Using Grow It York as a test-bed, we are working with LettUs Grow (an indoor farming technology provider from Bristol) and Vertically Urban (horticultural lighting company) to investigate how vertical farming can play a role in creating positive environmental change beyond the known benefits gained from efficient land use and minimal water use. We are exploring more energy-efficient lighting, more sustainable growing medium materials and packaging for produce, as well as the potential to become a pivot for a hyper-local circular economy.

Grow It York contributes to social innovation by promoting food system education, hosting guided tours and workshops to engage children, young adults and local communities. We are contributing to community development and health by bringing fresh nutrient-rich greens to communities with low socio-economic background, through partnering with a local food bank to supplement food supplied from supermarkets and promote increase consumption of leafy greens.

Lastly, we are developing an innovative business model to support both our environmental as well as social aims. This includes collaboration with local start-up food outlets and providing the flexibility to grow both well-known crops such as basil, as well as more unusual micro greens, herbs and even flowers for the creative food businesses in Spark*.

Based on this research, we are demonstrating that whilst an individual small-scale indoor farm's contribution to food security in the UK may not be of huge significance, it does have a positive impact on the local food system, aiding regenerative urban development in various ways: inspiring cooperation between researchers and commercial, public and civil society actors; encouraging circular flows in the city region; and raising local resident's interest and knowledge in urban food production.

Social enterprise and local community understandings of healthy and sustainable food

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This paper introduces and reports on transdisciplinary and multi dimensional research in progress exploring the role of social enterprises as catalysts for healthy and sustainable local food systems.

The pressing importance of engaging diverse members of local communities in discussions about their understandings of affordable, healthy and sustainable food has received increasing attention (Bhunoo & Poppy 2020). While systemic inequalities underlie poor diets, food scarcity and obesity (London Child Obesity Taskforce 2019), in practice healthy eating and obesity initiatives often focus on individual education and behaviour change. Such 'top-down' campaigns often fail to recognise the cultural, social and sensory significance of food practices (Rhys-Taylor 2020) and are easily perceived as patronising and stigmatising to low income and BAME communities (Jones 2019). Some social enterprises, however, are active in demonstrating more 'bottom up' ways of engaging local people in healthy and sustainable food. This paper will report on initial findings from our transdisciplinary research exploring the role and potential of a range of such social enterprises as catalysts for inclusive, sustainable and healthy local food systems. Research is in progress with six diverse social enterprises who are active partners in the project. The case study partners were selected to capture different organisational approaches and ways of engaging with sustainable and healthy food, in diverse community contexts across England, Scotland and Wales, including areas suffering deprivation and disadvantage and exhibiting different patterns of ethnic diversity. Research employs a co-creation process involving academics, our practice-based partners Shared Assets and social enterprise staff or volunteers who take on the role of community researchers.

We focus here on one aspect of the project which explores how representatives of the social enterprises and diverse members of the local communities they are embedded in understand and practice 'healthy' and 'sustainable' food and how they conceptualise local food systems. In this our approach is informed both by work on food practices (Delormier et al 2009; Domaneschi 2012) and on foodscapes (Earl 2018; Mikkelsen, B.E. 2011). Interviews will be carried out with representatives of the social enterprises and focus groups conducted with members of the local community. Members of the focus groups and representative of the social enterprises will then participate together in food mapping workshops to represent local food systems and barriers to and enablers of access to healthy and sustainable food.

Interviews and focus groups will be recorded and transcribed in full. Food maps will be photographed and reports on each of the workshops will be produced. Codes for thematic analysis of data will be developed in discussion with case study partners and facilitated by NIVIVO. Emergent findings will focus on identifying areas of synergy and potential tension between discourses and draw out opportunities and challenges inherent in local food systems. We will also reflect on how we have tried to enact transdisciplinary ways of working within this element of the project and some of the learnings we are developing along the way.

Foraged and “semi-wild” food from urban green infrastructure as a means to develop sustainable and resilient food systems

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Edible cities initiatives and community gardens increase in popularity and are often considered as intervention for social inclusion and as a means to establish a city food system to tackle climate change impacts. Scholarly work concerned with these initiatives commonly focuses on the educational, and community-building aspect of the collective and public production and consumption of herbs and annual vegetables within their neighbourhood. Less attention has been paid to the social, environmental and economic impact that could be achieved by gathering wild plants and fungi and by growing perennial plants, shrubs and trees with edible crops in cities. Urban foraging, “the harvest or gathering of raw biological resources within urban and peri-urban settings” (Shackleton et al., 2017), is a practice that, although more common in some parts of the world than in others, arguably happens everywhere in some form or shape. Despite its pervasiveness, it is often barely noticed and not formally recognised, and also under-researched as a (sustainable) form of food production and consumption. Forest gardens and (peri)urban agroforestry are ways to design landscapes in which perennial plants and trees dominate that can be foraged in a “semi-wild” form. Drawing on a systematic review of literature and policy that focuses on urban foraging and urban food forestry in the Global North, this contribution asks which benefits can be derived from urban green infrastructure designed for foraging and semi-wild cultivation of perennials and fungi. We aim to showcase the transformative potential of incorporating wild foods in urban food production, conservation and land stewardship strategies. We do so by illustrating the cultural and ecological ecosystem services of (semi)wild foods with regard to four dimensions: (1) carbon sequestration, (2), biodiversity restoration, (3) food production, and (4) social benefits. We then explore the barriers and enablers of these practices from a governmental, institutional and perceptual viewpoint and recommend pathways for incorporating wild foods and their semi-cultivation into the edible cities agenda. Reviewing the field of (semi)wild foods in cities we find that they are generally asserted a great potential for sustainability transformations, resilient food systems, and sovereign communities. However, their multiple benefits can only be yielded through considerable efforts backed by policies overcoming political-economic barriers.

Tackling challenges in the out-of-home urban food environment through an entrepreneurial ecosystems approach: The case of Bradford, UK.

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Meals and snacks from outside the home are forming a growing proportion of our diets. In the UK, up to a quarter of our calories are consumed out of home. “Out-of-home” comprises food or drink purchased for immediate consumption, from places such as restaurants, takeaways, coffee shops, retail outlets and vending machines, as well as home-delivery services.

Current interventions to tackle issues related to the rise of out of home food practices are sparse, and commonly focussed on the calorie content and health impact of these foods, with recommendations for action focussed on control over portion sizes, calories, sugar and salt contents. Issues related to out-of-home meal supply and consumption are however much more complex. Aspects such as the lack of transparency of ingredient sourcing, and higher availability of fast food outlets in more deprived areas, and the current inflation raise environmental and inequality concerns, calling for a more integrated food systems perspective that takes into account systemic issues beyond the separate domains of food security, nutrition, economy and the environment.

In order to address challenges in the out-of-home urban food environment in a holistic way, this research suggests the concept of entrepreneurial ecosystems (EES) as an analytical and practical framework. EES are dynamic local social, institutional, structural and cultural processes and actors that encourage and enhance new thinking and growth (Malecki, 2017). These EES also include a set of cultural, political, economic elements that allow urban food (service) providers to start, sustain and scale-up.

Focussing on Bradford, a city in the northern English county of Yorkshire, as a case study, the framework of entrepreneurial ecosystems (EES) is utilised to assess the components of the existing entrepreneurial ecosystem and to establish policy objectives for transformation towards a more sustainable local food environment.

D07: Steering towards circular and low-carbon consumption and production

Session Chair: Rebeka Kovacic Lukman

Room: B: Omnia, R: Momentum 1 (max. 30)

The impact of carbon tax and government subsidy on green products under competition

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Green products are becoming very popular nowadays with increasing consumer awareness, climate change problems, and government regulations. The decision-makers worldwide also devise different policies to tackle the carbon emission problems and promote green products. The carbon tax scheme is one of the most popular and widely adopted carbon emission reduction policies. Government subsidy, provided to the manufacturer or the customer, is also a very popular mechanism to promote the production and consumption of green products. So, the government or the decision-makers can use the carbon tax, subsidy, or both to reduce carbon emissions and promote green products. Therefore, this study considers one manufacturer-one retailer two-echelon supply chain to study the impact of the carbon tax and government subsidy in reducing carbon emissions and promoting green products. The study considers that the manufacturer produces substitutable green and non-green products and sells them through the retailer. The article studies a total of six cases having 1) No Carbon Tax and No Government Subsidy, 2) Carbon Tax but No Government Subsidy, 3) No Carbon Tax but Government Subsidy provided to the manufacturer, 4) No Carbon Tax but Government Subsidy provided to the customer 5) Both Carbon Tax, and Government Subsidy provided to the manufacturer, and 6) Both Carbon Tax, and Government Subsidy provided to the customer. The article considers the utility demand function for each case and uses a two-stage game-theoretic model to analyse the impact of the carbon tax and government subsidy on substitutable green and non-green products. The results of the article show the conditions under which carbon emissions can be reduced and green products can be promoted for each case. The article also compares results obtained in each case to derive conclusions regarding policies. The study will help the government or the decision-makers in devising policies to promote green products in terms of the carbon tax and the subsidy. This will help them to take decisions about when to impose the carbon tax and when to use the subsidy. This will also help to understand when the subsidy should be given to the manufacturer and when to the customer. The study will also help all the players to make optimal decisions under different cases. Overall, this study suggests how the government and the supply chain players can promote green products.

Voluntary industry-wide agreements to halve climate footprint of sold food - the case of Sweden

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Introduction: Inspired by the current EU regulation that stipulates that car manufacturers must reach a specific fleet-average emission level across all cars sold by a certain year, we analyze how a voluntary industry-wide agreement for sold food could be developed. We wish to analyze the opportunities of legally binding targets in the food sector, in line with the current EU regulation that stipulates that car manufacturers must reach a specific fleet-average emission level across all cars sold by a certain year. This paper aims to (i) develop this “policy innovation” through stakeholder workshops with representatives from the major food retailers and authorities in Sweden and analyze (ii) its potential benefits and drawbacks from a policy perspective.

Background: Food retailers could potentially play a key role in the transition to more sustainable consumption patterns, as they are strategically situated to influence both producers and consumers. Downstream - towards consumers - they can coordinate a range of different soft measures in order to facilitate sustainable consumption practices: e.g., which products/services they have in their assortment, choice architecture in the store/website, what they include in their advertisements, as well as adjusting relative prices. Upstream - towards producers - they can support or put pressure on producers to reduce emissions through new products and reduced emissions in their supply chain.

Perhaps in light of this strategic position on the food market, many retailers have also formed ambitious climate targets. In the UK, five food retailers, notably TESCO and Sainsbury's who together have close to 50% of the market share, have joined the WWF's campaign to halve the climate impact of consumers' food purchases by 2030. Sweden's leading food retailer, ICA, has adopted a similar target of halving the climate impact from the products they sell by 2030.

Oligopolistic markets with a few dominant retailers typically increase the chances for cooperation among actors.

Research questions:- How can indicators of climate footprint and other sustainability aspects of products sold be designed in the food sector?

- How can a voluntary agreement be designed?

- What roles can the government and NGOs play in order to support and put pressure on the work of companies to improve the sustainability of the products they sell?

Materials and Method: The research questions will be analyzed through high-level stakeholder workshops with representatives from Swedish food retailer ICA, Axfood and Coop, as well as with governmental authorities and NGOs. A first workshop has been conducted and coming workshops are planned. A comparative analysis will be made with the existing Swedish voluntary agreement regarding halving food waste in the Swedish food sector.

Circular economy in the Baltic states: application of composite index

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Circular economy (CE) approach aims at reducing dependency on imports of resources, reducing materials and energy consumption as well as increasing materials circularity. Ambitious goals set in this area by EU policies including Green Deal, Waste directives, Circular economy action plan have to be monitored and provide insights on the implementation progress. As presented in Monitoring framework for the circular economy (2017), there is a number of indicators foreseen to track the course of CE implementation. This paper based on foreseen indicators and their modifications aims at assessing the circular economy implementation in the Baltic states in comparison to EU27 over the period of 2010 – 2019. Based on OECD methodology a composite indicator was created, representing circular economy areas like consumption and production, waste management and secondary materials (8 indicators in total). Data used in calculations is retrieved from Eurostat database. To standardise data T scores were used, subindices and final index were calculated including indicators and subindices on the equal basis. Results show that consumption and production subindex was decreasing in the Baltic states, increasing waste generation per capita being the main reason for that. During the same period EU27 consumption and production subindex was slightly increasing, as waste generation growth rate was lower and resource productivity grew more significantly than in the Baltic states. In 2019 this subindex reached 54.5 scores in EU27, 49.7 in Latvia, 45.4 in Lithuania and 42.5 in Estonia. Waste management situation was improving in all countries and EU27 on average. Over 2010- 2019 waste management subindex has increased 12.4% in EU27, 79.3% in Latvia, 53% in Lithuania and some 40% in Estonia, still scoring the highest value in 2019. The subindex of secondary materials during the whole period was the lowest in Lithuania, other countries showing better, however not consistent results. Material circularity rate was rather small in all countries analysed. The overall circular economy index shows increasing trend in all countries. However, if growth in EU27 was rather stable, the Baltic states' index fluctuated and was lower EU27 on average. In between Baltic countries, the best situation regarding circular economy is seen in Estonia. Despite that countries need to improve in all areas to catch up EU27 on average, especially in resources productivity, recycling of specific waste streams, and material circularity. In general focus on waste management priorities should be maintained.

From behavioral to institutional lock-in – Identifying and operationalizing different forms of carbon lock-in in three air travel domains

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To achieve the global climate targets and keep the temperature rise well below 2 degrees, all sectors must drastically increase their efforts to reduce their greenhouse gas emissions. The transport sector faces particularly great challenges due to rising emission levels. Aviation, in particular, is strongly subject to so-called "carbon lock-in". This concept, introduced by Unruh (2000), encompasses a combination of technological and infrastructural, institutional, and behavioral components that perpetuate the emissions-intensive status quo. Since the widespread application of more sustainable aviation fuels and propulsion systems lie in a distant future (Peeters et al., 2016), addressing institutional and behavioral lock-in factors is particularly important, while still acknowledging the close linkage between technological and social systems. Whereas the general concept of carbon lock-in is very helpful in understanding the complex and interrelated dynamics that lead to persistently high emissions in theory, to the authors knowledge, the term carbon lock-in itself has not yet been operationalized and its meaning in a specific context is not entirely clear. In this ongoing study, we therefore aim to identify and operationalize relevant lock-in factors in the context of passenger air travel, focusing on business, leisure, and academic air travel. The approach consists of two parts. A systematic literature review is currently conducted using Scopus and Web of Science to identify relevant literature that addresses lock-ins in air travel. In parallel, three separate empirical surveys operationalizing lock-ins in each of the subsections are conducted, and their results are compared descriptively. We hypothesize that the predominant types of lock-ins differ across travel sectors, with leisure air travel subject to stronger behavioral lock-in, while academic and especially business travel are more strongly influenced by institutional lock-in. In this way, the study illustrates how the broad concept of carbon lock-in can be operationalized for a specific context and thus provides conceptual and practical insights into the relevant subject of emission reductions in air travel. Through this process, we also aim to discuss possible solutions and strategies that tackle the identified dominant lock-in factors.

Unruh, G. C. (2000). Understanding carbon lock-in. *Energy Policy*, 28(12), 817–830. doi: 10.1016/S0301-4215(00)00070-7

Peeters, P., Higham, J., Kutzner, D., Cohen, S.A. and Gössling, S. (2016). Are technology myths stalling aviation climate policy?. *Transportation Research Part D: Transport and Environment*, 44(3), 30–42. doi: 10.1016/j.trd.2016.02.004

Tracing carbon footprints to supply chain intermediaries in the United Kingdom

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Several decades of informed warnings about climate change have been insufficient to reverse trends of rising greenhouse gas (GHG) emissions and ecological degradation. Recent studies have emphasised the significant role of power for absolute reductions in material throughput: power to initiate change (e.g. through collective action) and power to resist change (e.g. through entrenched interests and institutions). Vested interest from the individual through the corporate to the geopolitical level have hugely profited, lobbied to prevent climate policies, and worked to discredit scientific evidence and shift social norms. Furthermore, the collective failure in modern industrial societies to imagine human thriving not dependent on perpetual economic growth and the carbon economy highlights the power of ideas as a key leverage point.

The global supply chains are increasingly complex, which has impaired discussions about the responsibility, power and agency of various actors for socio-ecological transition. In the context of environmental impacts, agency and power are highly connected as higher agency in terms of impacts corresponds to power in terms of contribution to the problem and ability to influence systemic change. Historically, environmental impact assessments have focused on the origin and consumption ends of supply chains, overlooking the role of powerful intermediary actors. In this study, we present a detailed analysis of the industrial contributors to the carbon footprint of United Kingdom's gross production. We find that 54% of the GHG emissions associated with UK gross production in 2019 originate within four major source industries, including fossil fuel-based extraction, manufacturing and electricity, animal-based food, and air transport. Furthermore, the distribution of emissions and value added provides implications about mitigation capacity and spatial justice.

D08: Living Labs: Reflecting on the structuration of transformation; addressing impacts, replicability and scalability - Potentials for Transformation (4/4)

Session Chair: Julien Forbat

Room: B: Omnia, R: Auditorium (max. 108)

Beyond experimentation: are urban NBS Living Labs in Europe and Latin America designed for transformative change?

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Amid the world's growing socio-environmental challenges such as climate change, land and biodiversity degradation, and rapid urbanization, Nature-based Solutions (NbS) have emerged as a potential multifunctional global response. Although the use of NbS has been slowly increasing, their incorporation into city planning and development still needs to be accelerated. Despite NbS co-benefits for urban environments as air, soil, biodiversity, and water quality improvements, and other socio-economic benefits, NbS continue to struggle to compete with conventional development approaches that dominate urban landscapes, and the prevailing urban governance regimes. Living Labs (LL), open innovation ecosystems experiments in real-life environments, have been widely promoted as a stepping stone to initiate transformation of the socio-technical systems in place and foster urban NBS uptake. However, there is limited knowledge regarding their contribution to transformative change. Living Labs are often reported to be isolated small projects, and to not always hold intentions questioning their capability to generate meaningful impact beyond their boundaries. There is a need to better understand how such projects can support NbS adoption in urban environments and foster social-technical transitions, in particular in regions where the concept of Living Lab is less developed, such as Latin America (LA). In Europe rich experience with urban Living Labs has been developed through multiple EU funded projects. However, knowledge exchange between LA and EU on urban NbS Living Labs still is at its beginning. Therefore, this study analyzes Living Labs' early actions to explore their potential to contribute to transformative change, within two distinct contexts, EU and LA. Drawing on four urban Living Labs in Barcelona, Buenos Aires, Santiago, and Turin, part of the H2020 project CONEXUS "urban nature connects us", this study aims to (i) identify what type of actions NbS Living Labs in urban environments are developing in EU and LA; (ii) understand what are the intentions and motivations behind their design and planning and how they are related to transformative change; and (iii) investigate how Living Labs activities can impact NBS adoption in and beyond their boundaries within the two regions. A mixed methods approach is applied consisting of the review of Living Labs' documents to take stock of the LLs activities and objectives formally reported; semi-structured qualitative interviews to gather insights on the LLs design process and participants' perspectives; and a literature review to

assess LLs successful impact factors and failure risks towards transformative change. The results of this paper are expected to support municipalities and other organizations from different backgrounds to more effectively and easily prioritize and plan Living Lab actions as mechanisms of change when replicating or scaling up those projects. This research will further allow a reflection on the role of Living Labs in the adoption of NbS and bring evidence from Latin American contexts, contributing to closing the informational gap present in the region.

Learning about learning how to sustainably improve Dutch neighbourhoods in a just way

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In the context of the Dutch energy transition, municipalities are experimenting with novel ways to e.g. reduce energy poverty, phase out natural gas in neighbourhoods, increase the energy efficiency of homes, stimulate the deployment of and local ownership over renewable energy sources, and reduce grid congestion. Experimental projects provide platforms for learning about alternative practices and socio-technical configurations. Combined with efforts to accumulate and circulate lessons learned, effective learning processes are considered crucial for replication and upscaling of experiments, the emergence of socio-technical niches, and for realising wider regime shifts (Geels and Deuten, 2006; Naber et al., 2017; Schot and Geels, 2008).

However, research showed that it is difficult to share lessons and knowledge from experiments due to their tacit and often context-specific nature. In addition, although the importance of learning and knowledge sharing is widely acknowledged in Sustainability Transitions literature, these processes are often conceptualised in a rather abstract way, received only limited empirical attention, and the literature provides little insight on how learning processes can best be organised (Van de Veerdonk, 2021; van Mierlo and Beers, 2020; Van Poeck et al., 2020). This study addresses these shortcomings in sustainability transitions literature by zooming into 'Communities of Practice' (CoP) that have consciously been initiated by niche intermediaries, e.g. actors who have developed a shared institutional infrastructure to stimulate collaboration and knowledge exchange between similar experimental projects (Kivimaa et al., 2019). As such, this study responds to calls by (van Mierlo and Beers, 2020; Van Poeck et al., 2020) to build on well-developed learning traditions to better understand learning processes in transitions. This study aims to assess CoPs as a means to stimulate learning and knowledge sharing between socio-technical experiments initiated by municipalities, in the context of the energy transition.

This leads to the following research question:

What is the potential of Communities of Practice to stimulate learning and knowledge sharing (between municipalities) in the energy transition?

This study adopts the analytical framework developed by (Van de Veerdonk, 2021) to assess to what extent CoPs stimulate learning and knowledge sharing processes in transitions. First, this framework is applied to academic literature on CoP, to explore the theoretical potential of CoPs to stimulate learning and knowledge sharing in the context of sustainability transitions. Secondly, this framework is applied to assess several real-life CoPs in the context of the energy transition. Empirical data is collected by conducting semi-structured interviews with niche intermediaries responsible for initiating the CoPs, as well as with participants. This allows for exploring the rationale behind the CoPs, and what makes them (in)effective in the perspectives of the participants. This study goes beyond first-order learning (e.g. is it effective?) by engaging in second-order (or reflexive) learning (e.g. by questioning why, how, when CoPs are (in)effective in changing practices and underlying assumptions). This study will result in both deeper understanding on learning in transitions and recommendations for intermediaries involved in initiating CoPs to stimulate learning and knowledge sharing between socio-technical experiments.

References

- Bos, J.J., Brown, R.R., Farrelly, M.A., 2013. A design framework for creating social learning situations. *Glob. Environ. Chang.* 23, 398–412. <https://doi.org/10.1016/j.gloenvcha.2012.12.003>
- Geels, F.W., Deuten, J.J., 2006. Local and global dynamics in technological development: a socio-cognitive perspective on knowledge flows and lessons from reinforced concrete. *Sci. Public Policy* 33, 265–275. <https://doi.org/0302-3427/06/040265-10>
- Kivimaa, P., Boon, W., Hyysalo, S., Klerkx, L., 2019. Towards a typology of intermediaries in sustainability transitions: A systematic review and a research agenda. *Res. Policy* 48, 1062–1075. <https://doi.org/10.1016/j.respol.2018.10.006>
- Naber, R., Raven, R.P.J.M., Kouw, M., Dassen, T., 2017. Scaling up sustainable energy innovations. *Energy Policy* 110, 342–354. <https://doi.org/10.1016/j.enpol.2017.07.056>
- Schot, J., Geels, F.W., 2008. Strategic niche management and sustainable innovation journeys: Theory, findings, research agenda, and policy. *Technol. Anal. Strateg. Manag.* 20, 537–554. <https://doi.org/10.1080/09537320802292651>
- Van de Veerdonk, M.M.A., 2021. How is knowledge diffusion and learning taking place in the regional energy transition ? Framework development and case study analysis of two energy regions in Noord-Brabant.
- van Mierlo, B., Beers, P.J., 2020. Understanding and governing learning in sustainability transitions: A review. *Environ. Innov. Soc. Transitions* 34, 255–269. <https://doi.org/10.1016/j.eist.2018.08.002>
- Van Poeck, K., Östman, L., Block, T., 2020. Opening up the black box of learning-by-doing in sustainability transitions. *Environ. Innov. Soc. Transitions* 34, 298–310. <https://doi.org/10.1016/j.eist.2018.12.006>

Living labs as transformative spaces for mindshifts and behavioural shifts: the role of Inner DG's for social innovation in circular and sustainable regional transitions

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In the growing need for climate action the SDG's are increasingly seen as important for sustainability and circularity transitions. Also living labs are perceived as a promising instrument for multistakeholder platforms and collaborative learning, experimenting and cocreation for sustainability transitions and seem to have a transformative capacity in solving 'wicked' problems and challenges. This implicates that living labs offer the transformative space for developing new knowledge, new policies and a new circular economy. The 17 SDG's provide a very good set of criteria in living lab activities for steering and anticipating on technological, economical and political aims and developments.

However: attention for the how of sustainability transition is lacking in the current discourse on sustainable development as the main emphasis is rather 'technocratic' and oriented on what should be realised in terms of CO₂-, energy- and waste reduction. The R-strategies and the nine Key Competencies for Design in a Circular Economy are guiding towards knowledge and skills needed in a circular economy. They do address a user-, stakeholder- and strategic orientation, besides the technocratic approach. The visions are clear, but the transition pathways are still vague. The 'how' approach gives more attention on crucial transformational leadership skills and competences for persons and networks.

The Inner Development Goals (IDG) framework of skills and qualities has recently been developed in order to successfully work with complex societal issues, in particular those identified in UN's Agenda 2030 and the 17 Sustainable Development Goals. This IDG framework is based on a first and broad exploration and not yet closely linked to a specific theoretical framework. We regard this IDG framework as a crucial stepping stone for further development and refinement of the social innovation aspects of sustainability transitions.

We assume that living labs create spaces for social innovation and growth of the IDG's, leading to the different shifts for future circularity catalysts, actions and impacts. In order to explore the relevance and role of the IDG's, we study how the IDG's are being addressed in the current 6 living labs of the Circular Sprong project in Brabant Province in the Netherlands. This 4-year project aims to establish a regional ecosystem steering towards sustainability and circularity transitions at a regional level. In the setup of the living labs we have the possibility to redesign educational-, entrepreneurial and research approaches, by explicitly giving a role to the IDG's in the different programs.

Along the 5 characteristics of the IDG's (being, thinking, relating, collaborating and acting) we will monitor how the IDG's are orchestrated in the living labs in terms of throughput, output and impact.

This research will be based on the method of reflexive monitoring (RMA), with actors participating in the 6 labs, focusing on mindshifts, skill shifts and behavioural shifts on personal and network level. We will draw conclusions on the output and impact per lab and on the regional ecosystem.

D09: Interventions to Change Consumer Behavior - Evidence from Experimental Research (1/2)

Session Chair: Joana Wensing, tbc
Room: B: Atlas, R: Atlas 2 (max. 80)

Promoting sustainable clothing consumption through psychologically targeted advertising

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To combat climate change and its consequences, consumers need to change their behavior. As the textile industry is one of the most polluting industries globally, we investigate how different targeted messages can effectively promote sustainable clothing consumption. Sustainable clothing consumption involves many different behaviors, but we focus on the promotion of reducing clothing consumption and reusing clothing because the threshold to engage in such behaviors are low.

Psychologically targeted ads can be highly effective in increasing intentions to engage with the message, stimulating click throughs, and even boost purchases (Matz et al., 2017; Winter et al., 2021). Hence, psychologically targeted could be a very useful nudge or boost to stimulate sustainable consumption (Hermann, 2022). Therefore, we expect that Instagram ads promoting reducing clothing consumption or reusing clothing that match the users' personality traits (extrovert vs. introvert) will lead to more engagement with the ad, than non-matching ads. In addition, we expect psychologically targeted ads to be more persuasive in promoting the preferred behavior, and thus will lead to a) more positive attitudes toward sustainable clothing consumption, and b) more intentions of sustainable clothing consumption, than non-matching ads.

Finally, we examine whether targeted social media campaigns could also lead to long-term behavioral change. Therefore, we also test whether ad effects persist and people actually changed their behavior in the longer term (2-3 weeks after exposure).

We are currently conducting an online experiment with two waves (wave 1 November 1-8; wave 2 November 14-19, 2022) and a 2 (ad targeting personality: extrovert vs. introvert) x 2 (ad message: reuse vs. reduce) between subjects design. We measured participants' level of extrovertedness to establish whether the ad matched their personality.

In the first wave of the online experiment, we exposed about 600 females to one of the four versions of an Instagram ad. The four ads were developed and pre-tested, and either focused on promoting reducing clothing consumption or it focuses on reusing clothing. All ads included two specific tips of how to reduce (e.g., clothing swaps and creating a capsule wardrobe) or reuse (i.e., buying second hand clothing and selling old clothes). In addition, the ad message

specifically targeted extrovert (e.g., organize a clothing swap party for all your friends) or introvert (e.g., swap your clothes online from the coach) people. We conducted a pre-test that showed significant and sufficient differences between the introvert and extrovert messages. After the exposure, participants are asked about their intention to engage with the ad, behavioral intentions and attitudes regarding sustainable clothing consumption, etc. Half of the sample will be asked to participate in a follow-up study, 2-3 weeks later, asking them about their actual behavior to examine the long-term effects of the ad. Results will be ready to be presented at SCP.

PROJECT RETOUR: Re-think consumer behavior to re-use circular rugs

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The disposal and destruction of rugs accounts for an annual 1.6 million tonnes of waste in Europe alone (Eunomia, 2018; GoldenStein, 2019). Currently, rugs are not designed to be reused and remanufactured, and business models do not incentivize the return and reuse, leading up to 97% of rugs ending up into landfill and incineration. To bend the curve, this consortium has developed a rug with a 70% lower carbon footprint through its bio-based materials and full recyclability to similar quality, new rugs. However, to reach this potential it is crucial that private consumers actually return their discarded rugs so that the materials can be reused as often as possible. Consumers play an essential role in enabling circularity, because they are the linking pin between the use- and the reverse phase (Camacho-Otero, Tunn, Chamberlin, & Boks, 2020; Vringer & Carabain, 2019). It is therefore crucial to understand what moves them to actively participate in enabling a circular rug by returning their rugs at the end of use. Encouraging consumers to voluntarily implement such circular behavior is a challenge, especially with products of which the moment of disposal is far removed in time from the moment of purchase.

This project, executed by Fontys Center of Expertise on Circular Transitions, Arapaha, Donkersloot Trade, Phenomena, and CuRe Technology, addresses the de question of how consumers can be motivated and facilitated to return their discarded rugs. The project develops and leverages insights from consumer behavior, product passports, and circular business model strategies into a communicative intervention that positively influences the consumer behavior as a means to enable the recuperation and reuse of rugs. The following objectives have been formulated:

- Investigate how end users can be motivated to return rugs correctly. Which return models are suitable for rugs, which information is relevant and which communication channels are effective in achieving the desired consumer behavior?
- Development of a material passport and communication strategy to support the return system.
- Translation of the results into a circular business concept that can be multiplied to other products and value chains.

The project represents stakeholders from the entire value chain and takes an interdisciplinary approach to developing the circular business concept. Whilst the project only targets rugs, the insights of the project are applicable to other contexts where consumer products have to be returned to enable a circular economy, such a solar PV panels and other interior products. The end result consists of an intervention for influencing the behavior of the end user, a materials passport and advice regarding a (replicable) business model. The results help to understand the interface between consumer behavior, material strategies and circular business models that is applicable in other contexts too. For research, the project provides input for new research avenues into, for example, the implementation of the EPR legislation, a reconnaissance for a quality mark for recyclable rugs, or resource stewardship strategies to make consumers aware of the circular quality of products at the time of purchase.

The Effectiveness of Inoculation in Promoting Sufficiency Consumption

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Eco-fashion has been on the rise in response to the growing concerns for the exhaustive impact of the clothing industry on our planetary boundaries. Although efforts to produce apparel more environment-friendly can be seen as a step in the right direction, concerns have been raised that this move is still geared towards persuading consumers to buy new (albeit sustainable) goods and has even been linked to increasing consumption levels. If the goal is to limit the environmental impact of the industry, promoting sufficiency consumption – the practice of consuming according to actual needs, thereby preventing overconsumption – might be a necessary route.

Although there have been attempts at marketing sufficiency consumption (e.g., Patagonia's famous "Don't buy this jacket" advertisement), it is still considered a niche phenomenon compared to pro-consumption marketing. Especially in online environments, pro-consumption marketing largely predominates. Clothing is one of the most frequently advertised goods online and social media use has been linked to conspicuous consumption. More research is therefore necessary to explore whether and how sufficiency consumption can be promoted in online environments when most communication is still geared towards promoting consumption.

The ability to actively reflect on the consequences of our behavior is a relevant component in pro-environmental decision-making. One way to trigger critical reflection could be through psychological inoculation. Research on inoculation has shown that warning a person of a preminent attempt of persuasion has been proven effective in eliciting critical thinking, making it then easier to resist the persuasion attempt. We propose that the concept of inoculation might be effective in aiding consumers to resist pro-consumption marketing attempts (even if those promote eco-fashion) and practice sufficiency consumption. We hypothesize that inoculating consumers against pro-consumption marketing attempts, prior to showing them an advertisement for eco-fashion, will lead to lower purchase intention and higher intention to practice sufficiency consumption in general. This effect is hypothesized to be stronger when the inoculation message contains specific arguments that target the marketing message, rather than when the inoculation message is more general. In addition, we expect the inoculation effect to be stronger for those who have a green attitude, compared to those with lower green attitudes. Not only will green consumers respond more favorably to the eco-fashion advertisement when not inoculated, their values are more likely to be triggered by the inoculation message.

To test these hypotheses, we have conducted an online experiment (n=395) with three (general inoculation vs. specific inoculation vs. no inoculation) conditions. Participants were shown an advertisement for a t-shirt made from organic cotton (with the message that organic cotton comes with a 91% water reduction compared to normal cotton), after which both their purchase intention for the shirt as well as their intention to practice sufficiency consumption regarding clothing in the future was measured. In the 'general inoculation' condition, participants were shown an inoculation message prior to viewing the advertisement that warned that not buying anything new is more sustainable than buying eco-fashion. In the 'specific inoculation' condition, the inoculation message prior to the advertisement specifically mentioned water reduction

tactics, stating that not buying anything new saves the most water. In the 'no inoculation' condition, no such message is shown. Additionally, we measured participants' green attitude, as we expect the inoculation effect to be moderated by consumers' green attitude. By including green attitude as a moderator, the study adds value in exploring how we can aid consumers in making the most pro-environmental consumption decision. Data collection has finished and data analysis is currently being carried out, making it possible to present the results in July.

Behavioral Change Intervention Research on Water Consumption and the Use of Water Refill Stations

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Presenter: Meike Sauerwein, meike@ust.hk (in person)

Despite the hot weather in the summer months, a large part of Hong Kong's student population drinks less water than recommended 2 liter per day. As tap water quality does not meet consumers' expectations and public water dispensers only gradually resume their function, bottled (non-water) beverages signify a substantial portion of the consumed drinks. This not only extends the burden on local landfill and coastal pollution but also contributes to larger climate impacts from beverage production and packaging. This study aims to explore how environmental or health goal setting as well as the visualization of personal water consumption can motivate students to increase their daily water intake. It further explores the effect of environmental impact visualization of beverage consumption on environmental concern and knowledge of research participants. We installed water flow meters and scanners on public fountains around campus to track water withdrawal behavior of 164 students during a 6-week intervention period (Oct -Nov 2022) and visualized the data on a mobile application. Research participants were randomly assigned into 3 groups, including one control group and two experimental groups which were asked to pledge towards drinking more water to achieve either health or environmental impact reduction goals. The app highlighted daily withdrawal amount, goal achievement, and impact reduction potential (e.g., the greenhouse gas emission savings from drinking water from water refill station compared to bottled-beverages due to the reduced impacts from reusable packaging and lower life cycle emissions of water compared to manufactured drinks). Pre-and post-surveys were conducted to evaluate beverage consumption habits, environmental concern and environmental knowledge of participants. Analysis will focus on the comparison of water withdrawal data, app access data as well as self-reported % changes of the reported beverages consumption versus water consumption. We expect that experimental groups (health and environmental goal group) will have a higher average daily water intake during the intervention phase compared to the control group. We further expect that participants with high environmental as well as biospheric/altruistic concern will have a higher average daily water intake compared to those with low environmental concern and participants with egoistic concern that are in the health goal group will have a higher average daily water intake compared to those with low egoistic concern, regardless of the group they are in (interaction effect).

As such this study will contribute to our understanding of key motivators towards consumer behaviour change in an Asian context and how or whether the visualization of individual impacts can facilitate behaviour change with regard to beverage consumption.

D10: Co-creating Sustainable Transformations of Food Supply Chains through transdisciplinary research

Session Chair: Ashley Colby

Room: B: Omnia, R: Momentum 2 (max. 30)

The main question and topic of the session is how transdisciplinary research can help transform food supply chains towards sustainability of food systems.

Research suggests the need for rapid implementation of sustainable agri-food systems solutions to avoid exacerbation of detrimental climate change, economic injustices, and negative health impacts (cf. SDGs) – particularly, considering recent global conflicts and pandemics. There is increasing research interest in investigating food supply chains (FSC), cooperative food businesses, and cooperative governance for advancing sustainability. Analytical, anticipatory, and strategic sustainability research is extended into transdisciplinary real-world experiments to create actionable knowledge for sustainable agri-food systems.

In this session we propose an open discussion on the (potential) roles of transdisciplinary research fostering sustainability of food supply chains and cooperative business and governance models. The context is an international team of researchers and practitioners working on both understanding but also potentially transforming sustainable food supply chains and networks around the world. A main thesis and starting point is that sustainable food supply chains can best be achieved in a close cooperation between research and practice and using experimental approaches.

In this session we propose a dialogue with attendees at the outset of the project with a focus on research questions, needs and the approach.

The goal is to foster exchange, identify needs from research and practice and advance transdisciplinary research in the field of sustainable food supply chains.

Line-up of speakers:

Ashley Colby, ashley@rizomafieldschool.com

Rebecka Milestad, rebecka.milestad@abe.kth.se

Pia Laborgne, pia.laborgne@kit.edu

Aylin Topal, aylintopal@gmail.com

Natapol Thongplew, natapol.t@ubu.ac.th

Kanang Kantamaturapoj, kanang.kan@mahidol.ac.th

Ying-Chen Lin, yingclin@fcu.edu.tw

Armin Wiek, Arnim.Wiek@asu.edu

Zühre Aksoy, zuhre.aksoy@boun.edu.tr

D11: Towards inclusive and sustainable bio-based value chains: a dialogue between industry, civil society and academia

Session Chair: Susan van der Veen, Lotte Asveld

Room: B: Omnia, R: Spectrum (max. 30)

There is an urgent need to replace fossil based energy and materials with more renewable sources. Companies that are based on fossil sources need to find alternatives and transform their business models. At the same time, millions of tons of biomass from agricultural or forestry residues are available that are currently underutilized, mismanaged or causing environmental issues. This brings opportunities for the creation of new bio-based value chains. Bio-based value chains can potentially contribute to the energy transition and to local socio-economic development in regions where biomass is sourced.

Bio-based value chains are complex and connect actors in different contexts, who previously did not collaborate. In order to create bio-based value chains that are inclusive and sustainable, all stakeholders need to be included in the decision-making from early stages on. The design of bio-based value chains should be sensitive to the realities of biomass producers, who in many cases are smallholders, and to the end-user point of view, who needs to respond to market demands. This can give rise to conflicts related to questions of responsibilities, choice of technology, efficiency and the distribution of risk and benefit. Collaborations between industry, civil society and academia are needed to overcome these challenges.

This session will explore challenges related to the development of inclusive bio-based value chains with 4 panellists who represent different stakeholders: biomass producers, industry and academia. All panellists speak from experiences with the transition to inclusive bio-based value chains. The purpose of the session is to share the experiences, needs and constraints from each point of view and to come up with a set of recommendations for the design future bio-based value chains.

Line-up of speakers:

Moderators: Susan van der Veen and Lotte Asveld

Business: (opportunities and challenges from business point of view)

- Mark Wolthuis, Business Development & strategy VARO Energy, Mark.Wolthuis@varoenergy.com, (confirmed)

- other panellist from business perspective (to be confirmed)

Civil society: (opportunities and challenges from smallholder point of view)

- Jeroen Kroezen, Senior Corporate Engagement manager Solidaridad, jeroen.kroezen@solidaridadnetwork.org, (confirmed)

Academia: (reflection on opportunities and challenges)

- Dr. Lotte Asveld, Associate professor at Dept. of Biotechnology / Biotechnology and Society group, TU Delft, l.asveld@tudelft.nl, (confirmed)

D12: Cumulating knowledge on the circular economy: an interactive dialogue-workshop

Session Chair: Machteld Simoens, Hanna Helander

Room: B: Omnia, R: Momentum 3 (max. 30)

In this interactive workshop, we bring scholars from various disciplines and backgrounds into a conversation on the circular economy (CE) and its (scholarly) narratives. The purpose of the session is to explore potential activities to enable a direct dialogue between scholars experienced in working with CE as well as introduce the participants to an alternative methodology for interdisciplinary knowledge cumulation. We propose the facilitation of a direct dialogue on the normative dimension and narratives underpinning CE research, following a narrative-led approach. In this direct dialogue, participants will reflect and discuss the normative dimension and narratives underpinning their research as well as collect potential future directions for interdisciplinary CE research.

With this direct dialogue, we aim to support interdisciplinary knowledge cumulation, a key endeavor for advancing sustainability science and sustainability transformations in society. However, current efforts often neglect the normative dimension of sustainability science as well as the variety of philosophical underpinnings and presumptions of the various research fields and disciplines involved. For example, the CE's interdisciplinary nature provides a unique opportunity to connect various scientific disciplines and is at the core of sustainable production and consumption. However, previous research has shown that scholars hold various perspectives on the potential of the CE to support sustainability transitions, which informs their research questions, study design, and policy recommendations. We believe that addressing the normative dimension and enabling a direct dialogue among scholars of various disciplines are crucial if we want to cumulate the breadth of knowledge on the circular economy and support interdisciplinary research.

D13: Community-Based Approaches to Sustainability Transformations

Session Chair: Robert Didham

Room: B: Atlas, R: Atlas 1 (max. 80)

Mindfulness, sustainable consumption and well-being: the role of consumer networks

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Sonja Grabner-Kräuter, University of Klagenfurt, Klagenfurt, Austria, sonja.grabner@aau.at

Presenter: Birgit Teufer, birgit.teufer@fh-krems.ac.at (in person)

Problem statement: Sustainable consumption has positive impacts on the environment and on people's health and well-being. However, consumption circumstances and social context often make it difficult for consumers to engage in sustainable behavior. Mindlessness has been linked to consumption-related problems and their impact on climate and the environment, as well as to poor health and much more (Bahl et al., 2016), whereas mindfulness could foster sustainable behavior (Fischer et al., 2017). Organizing consumption in community-based consumer networks such as FoodCoops, community supported agriculture, timebanking or community gardens can contribute to more sustainable consumption, not only in terms of what and how products are consumed, but also in terms of embedding consumption in a social network. **Research aim:** The aim of this study was to explore the role of consumer networks in fostering mindfulness, sustainable behavior, and health and well-being

Methods: We conducted semi-structured focus groups with 17 consumers from consumer networks (FoodCoops, timebanking, community gardens, community supported agriculture) as well as interviews with 6 producers with connections to these consumer networks (suppliers of FoodCoops and farmers who operate a community supported agriculture farm) and 6 experts in the field of sustainable development. Some types of consumer networks (e.g. timebanking and community gardens) lead to a - deliberate - blurring of the boundaries between consumers and producers (so-called "prosumers") which means that the "consumer" focus groups also cover the views of producers. We therefore did not separate opinions of consumers and producers to get a comprehensive picture. We analyzed the material by means of reflexive thematic analysis (Braun and Clarke, 2022).

Findings: Our findings suggest that consumer network membership, mindfulness, sustainable consumption, and health and well-being are linked. Consumer networks are seen as facilitators for mindful, sustainable behavior even though we are facing adverse circumstances that discourage such behavior. Consumer network membership is associated with mindfulness and social embeddedness. The membership in consumer networks was described as inherently and directly influencing sustainable behavior and healthy eating, avoiding the need for sustained critical attention when making purchasing decisions. Social embeddedness can contribute to both mindfulness and sustainable behavior and is itself important for health and well-being.

Conclusions: Consumer networks can help mitigate the adverse conditions that impede mindful, sustainable consumption behaviors. In particular, when the social norm or the immediate family environment does not prescribe sustainable behavior, social embeddedness is an important factor for mindful, sustainable consumption.

Practical and scientific implications: Consumer networks should not only focus on directly promoting sustainable consumption, but also on promoting social inclusion and community building in order to use social embeddedness as a self-reinforcing factor for sustainable consumption. Since we conducted our research in Austria and Germany, further research could focus on other countries, including non-industrialized areas. Our qualitative approach allowed us to uncover underlying mechanisms and relationships that could be explored in more detail through quantitative research. Relationships among different variables could be statistically tested using samples of members and non-members of consumer networks.

Community Garden: Nexus of Food, Ecology and City

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Presenter: Ayşe Kaplan Sarısaltık, ayse.kaplan@oslomet.no (in person)

Increased population and a shift from agricultural to residential areas lead to challenges in accessing safe and healthy food. Therefore, urban agriculture has become inevitable. Urban agriculture provides opportunities for ensuring food security, conserving biological diversity, and recycling wastewater and urban waste. Community gardens are good examples of urban agriculture implementations as providing sustainable food consumption and production by activating the local community, empowering people to produce their food, and increasing the knowledge base. METU Bostan is a community garden on the Middle East Technical University (METU) campus and has served as a living educational laboratory where socially, economically, and ethnically diverse people can grow and share vegetables, fruits, and flowers collaboratively since 2014. This study aims to explore the role of METU Bostan in bridging the gaps between scientific theory and practice in terms of sustainable production and consumption. The central concern of the study revolves around the questions;

How does METU Bostan create a setting for alternative and interdisciplinary learning area in the context of sustainable agriculture?

How does METU Bostan create a link between the campus and the city?

What is the ecological effect of METU Bostan in the gardening area?

To answer the questions and fulfill the aim, auto-ethnographic and action research methods are adopted. Since the study covers both social and environmental aspects of sustainable food production and consumption, both qualitative research and environmental monitoring methods are used. The first and second questions will be mainly answered through interviews and the authors' archives. Since one author is the founder of the community garden and the other author has been an active member for the last five years, they have an archive of written and visual sources such as meeting reports, documents and videos. The last question will be addressed through the data obtained from monitoring the natural sources in the area, such as soil properties.

The findings indicate that METU Bostan creates significant changes for volunteers by making the community garden an informal, open, land-based learning space. Members of the community can experience the application of different kinds of organic agriculture methods. It is also analyzed that the METU Bostan community garden creates networks between students and other sustainable food communities in the city as well as providing new channels to access healthy food. Therefore, it encourages young people to develop sustainable food habits.

Moreover, the METU Bostan community garden shows that working collectively is the key to creating and maintaining community spirit, which serves as a type of "adhesive" and a reference point for the community. Volunteers consider building a community spirit collectively as a real achievement of the METU Bostan. This community spirit is kept alive and successfully transferred to newcomers. Lastly, it is observed that organic carbon amount and soil water retention capacity are improved in the soil. It is also observed that biodiversity has increased. It is concluded that community gardens can be an alternative learning opportunity for many students. Community gardens have great potential to provide sustainable food practices on campus and in urban settings.

Assessing impacts and diffusion potentials of social innovations for sustainable consumption

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Capitalist production and consumption patterns are largely responsible for exceeding the planetary boundaries. The negative consequences of this overstepping are becoming visible through increasing levels of climate change, loss of biodiversity and natural environments. Consequently, there is a growing need for a socio-ecological transformation.

As a response to these challenges, social innovations for sustainable consumption (in different fields such as food, energy, mobility or housing), that contribute to the sustainable transformation of consumption and production, are emerging from within the society. They offer solutions to societal problems by stepping out of capitalistic structures to meet social and ecological needs. In the process, they facilitate the creation of new social relationships and collaborations. As such, they are new approaches to a sustainable economy with a high potential for change. While concepts for social innovations for sustainable consumption are already well researched (Jaeger-Erben et al. 2017), there is a lack of empirical research specifically addressing their impacts and transformational potential.

To close that gap, we conducted two studies.

The first study aimed at gaining insights into the impacts of social innovations for sustainable consumption by investigating the two cases of social innovations for sustainable consumption, community supported agriculture (CSA) and online resale platforms for smartphones. We gathered qualitative data through interviews, workshops and media analysis. We investigated the complex setting of actors and dynamics of social innovations for sustainable consumption in their different fields. As a result, impact models for the two cases were established, that allow a preliminary impact assessment of additional types of social innovations for sustainable consumption.

Based on the insights gained through the impact model, in the second study a panel survey was conducted in February/March 2023. A representative sample of German citizens (n=2000) answered questions regarding their knowledge, motivational factors and barriers, usage habits and self-reported potential usage of different social innovations. The aim of the study is to assess the (potential) diffusion of social innovations for sustainable consumption and to describe different types of (non-)users.

Bringing together the results of both, the impact assessment and the panel study we aim at developing an approach that will help to establish long-term observation of the diffusion and impacts of social innovations for sustainable consumption.

In our presentation we will give an insight into the results of the panel study.

Community development and social learning in the context of the mining industry: assessing social activities and circularity in mining areas in Spain

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Presenter: Marielle Feenstra, m.h.feenstra@tudelft.nl (in person)

To contribute to community development, mining and mineral companies have invested in social projects to alleviate poverty or address needs in local areas near their centres of operation. Investment in community activities and services, such as schools, hospitals, and sponsoring external health/education service providers are typical in the mining and metal industry. The growth of other activities in parallel to mining has been on the radar of corporations supporting microcredit, entrepreneurial schemes, and educational activities. Regarding benefit sharing and empowerment as a key aim of community development, a social learning approach can contribute to empowering communities towards more sustainable behaviour. Furthermore, social learning activities can contribute to a better understanding of the mining operations in the region and their environmental protection and sustainability policies.

Using a framework of social learning and learning-based change, we assess educational activities of the mining companies and their learning results in the EIT Raw Materials funded SISTEM (Social innovation for sustainable treatment of European metals) project. The framework promotes strategies of learning in a reflective, experiential, experimental, participative, iterative, real-world, and action-oriented manner with communities. The framework intends to go beyond the social impact assessment methodologies, hence going further than social investment information in Sustainability Reports. The framework addresses (1) participation and interaction, (2) components of social learning activities, (3) cognitive skills, and (4) target groups and goals. The study has been applied to several cases from the mining industry in different parts of Spain, Andalusia and Navarra.

Empirically, the paper reports on the assessment of social learning activities in the SISTEM project, based on six in-depth interviews with key experts involved in these social learning activities around sustainability, environment protection and circularity. Their reflections and observations of the social activities, how these were organised and their impact were also fed into the social impact analysis. Conclusions and recommendations of the social impact assessment have been used to develop guidelines for social learning activities in the mining and metal industry.

Building Communities for Sustainable Change to support local entrepreneurs in rural areas in Costa Rica

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Presenter: Shirin Betzler, shirin.betzler@uni-osnabrueck.de (in person)

Problem statement and research question: Rural regions have a great potential to drive rural economic development, reducing unemployment and poverty, improving living conditions, and strengthening sustainable growth. Costa Rica, with its emerging economy, its pronounced urban-rural divide, and a growing number of local entrepreneurs, shows great need but also potential in terms of fostering sustainable production processes as well as sustainable consumption structures. Therefore, the present project establishes and evaluates a pilot program bringing together students and local networks of entrepreneurs in rural regions of Costa Rica.

Theoretical approach and methods: In initial in-depth interviews, rural entrepreneurs often reported lacking resources in terms of specialized knowledge and skills, e.g., in accounting, marketing or social media management. Since many entrepreneurs also lack the time and financial resources to meet these needs, they benefit particularly from external support to further develop their businesses. Students provide expertise in specialized areas for the entrepreneurs while making meaningful contributions to society and to promote a socio-ecological transformation. Therefore, pairing students with networks of entrepreneurs provides an opportunity to foster local entrepreneurial activities as well as students' personal and professional development. The present project aims to establish the structures of a student transfer program with entrepreneurial networks from two rural pilot regions, Turrialba and Dota. It qualitatively evaluates a pilot run of the program with key stakeholders, namely, German and Costa Rican students, and entrepreneurial networks.

Findings: The current project offers a tangible benefit in an applied context. The project connects various actors from and outside of the regions Turrialba and Dota (representatives of local producers, cooperative networks, universities, students and municipalities) and combines their expertise. Results from interviews with key stakeholders on their experiences with the pilot run of the program's processes and structures (e.g., the coordination between the actors involved, long-term knowledge storage, or the evaluation of the program's success) will be reported.

Conclusions and Implications: The project fosters all pillars of sustainability and makes a strong contribution to rural, sustainable development. First, the networks aim at supporting economic sustainability through local entrepreneurs, e.g., by circumventing intermediaries and bridging the distance between producers and consumers. This enables local entrepreneurs to access new market segments of conscious customers in the metropolitan area of Costa Rica. Second, the networks contribute to social sustainability by promoting rural development. They include local stakeholders as main actors within business development. Virtual visibility on the websites of the networks additionally benefits the regions' technological advancement. Third, the networks depict ecological sustainability by acknowledging sustainable practices and including entrepreneurs' certifications, such as the Bandera azul certifying the responsible handling of natural resources or waste management, the denomination of origin label certifying certain

standards in animal welfare, or organic or fairtrade certifications. Thus, the project directly aims at transitioning towards a more sustainable production-consumption system.

E: Friday, July 7, 11.30-12.45

E01: Critical Perspectives on Consumption Policies and Policy-Making

Session Chair: Sylvia Lorek, tbc

Room: B: Omnia, R: Podium (max. 269)

Towards a governance framework for circular economy in cities

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Approximately half of the world's population is today living in cities and the UN estimates that two thirds of the global population will live in cities in 2050. Cities are huge contributors to environmental impacts, resource consumption and GHG emissions and the global urbanization trend is likely to increase the environmental footprint of cities in the future. The environmental impacts of cities are diverse in character, arise from many different activities and involve many stakeholders. Cities across the world are therefore exploring pathways towards a sustainable development and the circular economy framework is often chosen as a preferred planning approach covering multiple policy targets such as GHG emission reduction, waste minimization, air quality improvements etc. Circular economy plans typically covers diverse topics such as circular strategies, urban refurbishment, green public procurement, and municipal waste management. Frameworks, tools, and planning approaches are being developed and tested Involving many modes of governance, but a coherent framework for cities and local governments is still needed.

This paper proposes a framework for implementation of circular economy in cities that combines multiple modes of governance and addresses all the typical planning areas in municipalities. The analysis is based on a series of case studies of circular economy strategies and plans in European cities. The paper includes three main sections: 1) Identification of areas of local governance – which areas are typically decentralized, under rule of local governments, and relevant for circular economy planning activities, 2) Identification of modes of governance in municipalities – focusing on the four modes of governance in municipalities: self-governance, governing by provision, governing by authority and governing through enabling, 3) exploring how to implement the four modes of governance in the identified areas of governance in cities. The paper concludes that cities can use the four identified modes of governance (self-governance, governing by provision, governing by authority, and governing through enabling) as a framework to identify policies and planning activities within and across the main planning areas in the cities.

Understanding corporate lobbying for government action to achieve sustainability transitions

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Problem statement and Research questions / aim: There is now widespread consensus that addressing today's complex global challenges requires several 'sustainability transitions'. While all organisations have their part to play in leading this change, many argue that government action is a crucial component to help support and coordinate these transitions (Delmas et al., 2019). This paper focuses on the phenomenon of corporate lobbying for more ambitious government intervention to tackle sustainability challenges and explores the role of responsible leadership in how we account for the occurrence of such activity.

Theoretical approach and methods/inquiry approach: The paper builds on both the Responsible Leadership literature (Maak et al., 2016; Patzer et al., 2018; Stahl & Sully de Luque, 2014) and Ricoeur's theories of the self, motivated action and the ethical intention (Ricoeur, 1992). The paper does this in the context of an empirical case – that of corporate lobbying for the UN Sustainable Development Goals over the period 2012-2015. The paper presents a critical hermeneutical analysis (Mees-Buss et al., 2020; Prasad, 2002) of 25 documents communicating corporate views to policymakers, and 57 interviews with 45 CEOs and senior executives representing 30 companies involved in this process.

Findings: The business leaders we spoke to cited strong public interest and commercial arguments for advocating for increased government intervention. Many leaders constructed narratives arguing they had a responsibility to use their influence to encourage sustainability transitions. This included calling for more ambitious intervention from governments, even if such interventions added cost to their business in the short term. Many went further to argue that increased public investment, incentives and regulation could grow markets, which would encourage companies to align responsibility with commercial incentives. The narratives they constructed to account for this action referenced life experiences like being personally exposed to people suffering as a result of sustainable-development-related challenges (perhaps through growing up in or spending a period of life in a developing country), having been the target of NGO campaigning, and being challenged to engage by other CEOs, friends, non-executive directors, senior political figures, public intellectuals and even their own children, and the cultural norms of the communities, organisations, countries and regions they had been part of, all contributed to CEOs' likelihood of supporting lobbying for government involvement. We call this action in response to encounters with others influencing responsible leadership "the echo of conscience".

Conclusions and practical and scientific implications: These findings suggest a range of implications for how to engage business leaders from all regions to encourage more to participate in lobbying activity to push governments towards more radical intervention on sustainability challenges. Drawing on both Ricoeur's theories of the self, motivated action and the ethical intention (Ricoeur, 1992) and detailed empirical analysis, this paper attempts to advance the Responsible Leadership literature by proposing a theoretical framework for understanding what accounts for the occurrence of responsible leadership for corporate lobbying for government action to achieve sustainability transitions.

Transformative goals, moderate actions - sustainable consumption in the circular economy policy in Finland

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Although overconsumption of natural resources is one of the root causes of climate and biodiversity crises, national policies to promote sustainable consumption have remained modest. The Circular Economy (CE) enjoys growing interest in policy and business circles and it is seen as one solution to transform consumption-production systems towards more sustainable futures. However, the CE is still lacking concrete indicators and targets compared to, for example, climate change mitigation. Only a few countries have set concrete CE goals, and a common understanding of what circular economy actually means, and the changes it may entail, in different sectors is still largely missing.

This presentation elaborates how sustainable consumption is visible in the CE policy landscape in Finland. Finland is a promising case as it is one of the frontrunner countries in CE in terms of agenda setting. The Government has approved an ambitious CE vision according to which 'a carbon-neutral circular economy is the foundation of our successful economy' by 2035 (Finnish Government 2021). The Finnish government has set the following CE goals:

In 2035, the total domestic consumption of primary raw materials will not exceed the 2015 level, Resource productivity will double in 2035 compared with 2015, and

Circularity rate of materials will double by 2035 (Finnish Government, 2021a, p. 12).

This presentation pays attention to the transformative potential of the national CE strategy in terms of transformative outcomes, based on Lazarevic et al. (2022). They have found out that the programme stimulates and accelerates niches, for example by increasing research and development funding, establishing networks and creating databases. However, regime destabilisation and coordination remain scarce. Overall, the emphasis is on voluntary measures and investigation, rather than on stronger and more transformative measures.

Building on the results of Lazarevic et al., our presentation pays explores the ongoing strategy implementation process. As the strategy was published in early 2021, the implementation of the proposed measures has begun. We will present the recent developments and discuss the need for additional measures, actions and resources especially related to sustainable consumption.

The presentation will provide suggestions for more systemic sustainable consumption approaches that are relevant for several countries pursuing CE goals.

References

Finnish Government, 2021. New Direction: A Strategic Programme for the Circular Economy (2021). Helsinki, Finland.

Lazarevic, D., Salo, H., & Kautto, P. (2022). Circular economy policies and their transformative outcomes: The transformative intent of Finland's strategic policy programme. *Journal of Cleaner Production*, 134892.

Aligning the UK food supply with national dietary guidelines: How coherent are current policies?

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Traditionally dietary guidelines have been used as a Public Health messaging tool, to educate citizens about healthy diets. Recently, there have been calls for dietary guidelines to be used as a tool to inform wider food systems policies. This is important, because if diets do shift closer towards the dietary guidelines, the overall food system must also be prepared to adjust to these changes in diet. This research study aimed to first of all assess where changes are needed in the UK food supply to better support national food-based dietary guidelines, and secondly gain an insight into the current landscape of agriculture and trade policies and how these might influence the food supply.

To do this, the current UK food supply was compared with the recommendations in the EatWell Guide to identify discrepancies and which food groups would need to be increased or decreased. As a case study, policies linked with the food supply through trade and agriculture in England were mapped to understand the current policy context. Two major trade and agriculture policies, the Agriculture Transition Plan and the UK-Australia Free Trade deal, were analysed to examine how coherent they are with shifting the food supply towards the dietary guidelines.

The comparison between the UK food supply and the diets that are being recommended to the public showed that there are currently fundamental discrepancies, particularly regarding lower proportions of fruit and vegetables, and higher proportions of dairy, sugar and oils in the food supply. The overall themes coming from the policy mapping were that of replacing EU policies with UK policies, and incorporating sustainability into new and existing policies, as well as establishing new trade deals with non-EU countries, and an overall lack of consideration on the potential health impacts of policies and how they may influence the supply of food.

Regarding coherence analysis of policy documents, there was limited data and impact assessments to estimate how exactly the Agricultural Transition Plan may influence the composition of the UK food supply, and therefore whether this policy is coherent with the Eatwell Guide. The UK-Australia free trade deal is likely to increase the supply of low-cost beef due to increase tariff-free quotas of imports. Future work would benefit from combining analysis of policy documents with key stakeholder interviews for a well-rounded view of the real-world impacts of policies, and instances of policy coherence.

It is clear that if the UK population were to eat in line with the dietary guidelines the food supply would also need to adapt. Developing an understanding of how the current policy landscape may influence the composition of the food supply, and where there are potential levers for change, is essential to the transition towards more coherent and sustainable food systems. This preliminary work is being developed into a PhD project, which aims to gain deeper insights into how dietary guidelines may be used improve coherence of agriculture policies for better health and environmental outcomes.

E02: Landscapes and Area-Based Approaches

Session Chair: Philip Vergragt

Room: B: Omnia, R: Quantum 1 (max. 30)

Redefining biological corridors as opportunity spaces: local actors' perspective and policy options in Costa Rica

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Costa Rica portrays an image of environmental responsibility and social harmony to the outside world, while it struggles internally with high economic inequality and the need to balance the competing demands between sustainability and economic development. The country's approach has been to support development and environmental protection simultaneously by promoting pure conservation in certain areas and intensive development based on an assumption of economic growth in others, such as in specific services to dynamic markets, tourism, and agro-exports. Within this context, biological corridors (BCs) represent the most recent conservation policy being favored during the last two decades, even when they are not officially part of the set of protected area categories of the country. In fact, BCs were defined from a pure biological perspective, as mere connectors, or "bridges" between larger protected areas. However, BCs represent complex social-ecological systems, where ecological connectivity meets with the presence of human communities and socio-productive dynamics. Moreover, there is lack of proper policy making approach of this complexity of social, economic, and environmental goals. The research question posed in the present ongoing research is: How can the approach towards BCs evolve to transcend their current conservationist approach and be redefined within policy framework as spaces for sustainable regional development?

The research is based on the theoretical bases offered by the fields of sustainability transitions, change agency, and transformative innovation policy. Initial in-depth interviews implementing policy mix analysis allow defining the framework regarding the processes, dimensions, elements, and characteristics of the two policy spheres concerning BCs: ecological conservation and local/regional development. The Bellbird Biological Corridor (BBC) is chosen as a strategically selective context to perform a case analysis to develop a within context strategy formulation. This approach is combined with the path tracing method to identify the trinity of change agency: innovative, institutional, and place-based entrepreneurship which allows identifying the causal mechanisms (i.e., path development) that leads towards considering the BBC as an "opportunity space" for innovative policymaking considering its temporal, regional, and agency specificities. A preliminary evaluation of agency factors allows for identifying the approach of the BBC as an opportunity space for policy experimentation and institutional change deriving in transformative innovation policy for sustainability transition, thus redefining BCs as spaces for sustainable regional development. This is an ongoing doctoral research which is at a fieldwork stage. Emphasis will be placed in the theoretical basis and methodological approach, including some initial findings such as the interactions identified between the governing ecological conservation and local/regional development policies, including the detection of tension sources. As a work in progress, the hypothesis is that BCs represent opportunity spaces for policy experimentation and institutional change. The BBC serves as a selective context in which the

strategic actors allow for the formulation of strategy within context, thus enabling transformative innovation policy promoting sustainability transition to thrive and be considered as an alternative for other BCs and protected areas of Costa Rica, as well as provide generic lessons for other contexts.

The mixed bags of export-driven tea and avocado farming on the state of biodiversity conservation and environment within the Mau-Mara landscape of Kenya, East Africa.

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Agro-commodity export standards remain key checks for environmental and human health safeguards in the decade with upturn of horticultural production for export market. However, scanty information is available on the net outcome of these standards particularly on biodiversity and environmental integrity across the Mau-Mara landscape in Kenya. Using survey data from tea and avocado producers in the study area, we examined: extent of growers involved in export-driven production, degree of adherence to export standards and resultant direct and indirect effects on biodiversity and livelihoods in Mau-Mara landscape within Kenya. We applied inductive approach in exploring effects of tea and avocado production on key selected biodiversity conservation indicators. We mapped geographical locations of small and large holder farmers and companies; undertook water and soil quality tests and assessed integrity of natural plant communities in the landscape to ascertain the state of key ecosystem components relative to agricultural production techniques. Localized positive effects on water quality, soil health and natural forest/vegetation protection were found associated with the minority certified producers compared to non-certified crop growers. Tendency of environmental degradation leakage was detected, particularly linked to tea processing units and to monoculture production systems. Availability of un-regulated local markets provided alternative avenues for non-certified ventures to boom up, aggravating the negative impact on environmental integrity. We recommend enforcement of both international and local standards to encourage and institutionalize sustainable agricultural production methods and culture that support enhanced sustainable biodiversity conservation and stable ecological systems within the landscape.

Telecoupled issues in tea production in Kenya: The case of Kericho County Kenya

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Agriculture is an important sector in Kenya and the major exports are tea, coffee, cut flowers, and vegetables. Tea is one of the major export earners in Kenya. In world stage, Kenya is the leading exporter of black tea. According to Kenya Economic Survey of 2022, tea earnings increased from KSh 122.2 billion in 2020 to KSh 126.1 billion in 2021. Majority of tea producers in Kenya are smallholders who are currently approximately 500,000. Most of these farmers depend directly on tea as source of income. Despite the importance of the tea exports on Kenyan economy and farmer's livelihoods, there are telecoupled issues associated with its production and consumption. Telecoupling is concerned with issues that arise due to global linkages and not those that are locally-generated, transboundary, and global commons. Telecoupling plays an important role in the emergence of globalized environmental problems. Currently, knowledge gap exists on the socio-economic and environmental issues associated with tea production in Kenya, effectiveness of the existing standards aimed at addressing the issues, and the limitations associated with governance towards addressing these issues. This is because studies on telecoupled issues related to tea production and consumption are very few, if any, in Kenya. The study will employ survey and laboratory experiment research designs. Smallholder farmers supplying tea to Kenya Tea Development Authority, Kenya Tea Development Authority officials, tea pickers, and environmental experts from Kenya National Environment Management Authority will form the sample size. The study will use focus group discussions during data collection. Both primary and secondary data will be used. Primary data will be collected using structured and unstructured questionnaire. Soils and water samples will be collected within the tea farms covered by the Kenya Tea Development Authority to test for any pollution resulting directly from the tea production. Secondary data will be used to complement the primary data. The findings will help guide policy formulation towards addressing the telecoupled issues facing tea production and exports in developing countries.

Private Sector Investors' perspective regarding sustainable consumption in the cities of developing countries: Case studies from Lahore-Pakistan and Mahendranagar-Nepal

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Numerous human activities such as overpopulation, pollution, burning fossil fuels, and deforestation harm the physical environment. These changes have triggered climate change, soil erosion, poor air quality, and drinking water. Technology, legislations and behavioral change by general public are the only ways through which the problem could be solved. The world in general and developing countries in South Asia-Pakistan and Nepal, in specific has undergone enormous and astonishing changes as a result of the rapid advancement in industries and technologies. Some of these developments give people new chances and challenges. Climate change and its increasing impacts on the lives and livelihood of people, mainly in the urban areas have been the principal challenge recently. While the industrial development and advancement of the country towards economic growth was much awaited, impacts on the environment has accompanied the growth.

This study was conducted to identify the interventions to reduce the emissions through technology and behavior modification, as perceived by the employees in the industrial sector and investors themselves in two of the cities in South Asia: Lahore-Pakistan and Mahendranagar-Nepal. Both secondary and primary data were collected to derieve and discuss the results. In total, 11 individuals each in Lahore and Mahendranagar were interviewed. Our study shows that the people have some level of technological awareness and sensitivity towards climate mitigative actions, and are in the situation of making recommendations. Some of the major suggestions made by the respondents in Lahore include reducing investments that are less environment friendly, promoting pro-environmental behaviour, reducing meat consumption and enforcing stricter housing regulations, among others as some of the climate mitigating strategies. In the case of Nepal, the suggestions were made mainly in terms of starting the green enterprises, promoting awareness regarding the incentives of sustainable consumption and private-sector friendly policies and frameworks, etc. The findings can also be utilized by the Provincial Government designing as well as implementing policies that create enabling environment for the private sector to start environment-friendly businesses. Also, this study will add to the very little literature that considers private sector as the principal stakeholders.

The Role of Sustainable Agriculture: A Case of Spatio-Temporal Linkage between Local Administrative and Provincial Scales, Nakhon Ratchasima, Thailand

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Agricultural diversities and productions have high competition in various global scales. Similarly, agriculture in Thailand is highly competitive from localities to regions. Therefore, this paper aims to study spatio-temporal linkage between local administrative and provincial scales in case study of Nakhon Ratchasima (NK) province, Thailand. For methodology, this study proposed a spatio-temporal analysis using geospatial tools for agricultural distribution based on 2 spatial clustering techniques: cluster and outlier analysis and hot spot analysis. This study used spatio-temporal land use data between year 2012 and 2022 from Land Development Department (LDD) of Thailand. As results, overall spatio-temporal land use of both local administrative (298.21 km²) and provincial (20,727.35 km²) scales were found that agricultural land has the highest number (> 50% as mostly paddy fields). Agricultural change in all local administrative areas in NK decreased from year 2012 to 2022 (1.62 km² or 0.54%) while overall NK province increased (46.23 km² or 0.22%). For spatial clustering analysis, cluster and outlier results between 2012 and 2022 showed the difference of local administrative (two groups: HH clusters and HL outliers) and provincial areas (four groups: two clusters (HH and LL) and two outliers: (HL and LH). Interesting, high-density of agricultural areas (HH clusters) in year 2022 was found that it is mostly active paddy fields in both study areas that they were located in north, south-eastern and middle-west areas. In hot spots-based Gi* analysis, hot-spot areas in both local administrative and provincial areas in year 2022 were more increased than year 2012 (they were highly explicated for agricultural area density such as sugarcane, corn, cassava, custard apple, pasture). Conversely, the decreased change of cold-spot areas in 2012 and 2022 was revealed as mostly paddy fields (they were located in the south-eastern locations). Consequently, the obtained results of this paper will contribute for the 20- national strategy (2018-2037), focuses on strengthening energy and food security through adaptation or survival from climate change. Especially, in food security, it will response (1) to support the active participation of the private sector or social entrepreneurship organizations and (2) to contribute market access and agricultural value chains for smallholders.

E03: Digitalization and App-Based Interventions to Promote Sustainable Consumption

Session Chair: Georgina Guillen-Hanson
Room: B: Omnia, R: Quantum 4 (max. 30)

Sustainability impacts of digital healthcare

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Digitalisation is transforming healthcare globally, and is often presented as a sustainable solution. It has potential benefits, such as reducing need for patients/staff to travel to appointments. However, there are negative impacts associated with production/use/disposal of electronic devices, and storage and transmission of data. At present, there is little evidence on these impacts of digital healthcare, making it hard for providers to embed sustainability into service design.

Our research investigates these impacts, focusing on the shift towards phone/video appointments. This paper aims to 1) provide an introduction to sustainability in digital healthcare, including a review of evidence and gaps; 2) discuss methodological challenges in digital sustainability research, and 3) present initial findings from qualitative research on digital innovations.

Theoretically, our research attends to how systems of provision can be reconfigured as part of sustainability transitions. In other words, we do not look at sustainability purely in terms of individual behaviour change or implementation of energy efficiency measures, renewables etc. Rather, we take a holistic view of how new “models of care” might minimise environmental harms. The ongoing digital transformation of healthcare offers opportunities to study the nature and impacts of such systemic transitions.

Methodologically, our research centres on England’s National Health Service (NHS), which aims to be the world’s first net-zero health service. We work closely with NHS services to understand how phone/video appointments are changing their working practices, and the effects on environmental outcomes. Our methods include: a literature review; a scoping workshop with 15 stakeholders; 6 document-based case-studies; and 15 expert interviews. We consider impacts of phone/video appointments on travel by patients and staff, use of estates and facilities, and use of information and communication technologies (ICTs).

The paper presents findings from initial phases of this ongoing project. First, it provides a review of current knowledge and gaps, with literature to-date suggesting significant benefits through reductions in patient/staff travel and associated emissions. However, this is a very small evidence-base, and data on wider impacts (e.g. space use and ICTs) is lacking. Second, it presents key methodological challenges, explaining how our project addresses these. Third, it reports initial findings from empirical research with healthcare practitioners. While we do not presently claim to have “conclusions”, our interviews offer valuable insights into the messy realities of implementing socio-technical innovations, and the myriad environmental implications of digital transitions.

The paper discusses implications for sustainability researchers interested in digitalisation and for those working on health issues. These concern: i) future research agendas; ii) methods, tools and proxies for investigating these complex areas; and iii) practical lessons from the schemes studied. Given the global nature of the digital health revolution, the paper discusses these

implications' relevance across national contexts. Ultimately, our research aims to support health services in meeting sustainability targets, and share best practice in digital innovation.

A decade of smart phone apps for sustainable energy consumption: Mapping the theories and techniques of research and commercial approaches

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In the last decade, a proliferation of smart phone apps to activate sustainability-related behaviour change have been designed and tested in both research and commercial settings. For example, Beck et al. (2019) found more than 2000 apps in the US Apple Store to encourage reducing individual energy consumption in 2019. However, little work has been done to get an overview of the theories and techniques being implemented in these apps and whether the last decade of experimentation has resulted in a convergence or divergence in design.

This question is investigated through thematic analysis of two sets of data: six interview transcripts with commercial app designers and the final reports from 20 European research projects. All 26 cases implement smart phone apps for energy-related behaviour change. The documents were deductively coded using an established list of behaviour change constructs from Michie et al. (2014) with additional adjustments specifically for energy behaviour (Bird & Legault, 2018; Delmas et al., 2013; Frederiks et al., 2015) and the use of digital tools, like smart phone apps (Perski et al., 2017). The resulting list of 26 behaviour change theories and 37 techniques were mapped for co-occurrence in each of the app cases to understand the frequency of the use of theories, and which techniques (i.e. design choices, such as sending reminders) were used to operationalise the theory.

The analysis found a wide diversity in the expected theories of behaviour change informing the app design with some clustering around motivation, intention, knowledge and feedback processes as important aspects of behaviour change. Similarly, techniques appeared to be broadly implemented without specific relation to the underlying theory. This may be a positive development to address critiques of more single-theory approaches, such as focusing only on knowledge or feedback-based campaigns (Axon et al., 2018; Buchanan et al., 2015).

However, with consideration of the relatively small sample size, best practices from the 26 analysed projects are limited as a strong theory-informed result is not visible. While it appears that there remains an appetite for digitally-based behaviour change for energy-related behaviours, converging towards more common approaches appears to have not taken place in the last decade. Looking forward, a more systematic use of techniques in order to evaluate the impact, cost-effectiveness, and longevity of these approaches seems pertinent to assess and capture the potential value of behaviour change apps.

Axon, S., Morrissey, J., Aiesha, R., Hillman, J., Revez, A., Lennon, B., Salel, M., Dunphy, N., & Boo, E. (2018). The human factor: Classification of European community-based behaviour change initiatives. *Journal of Cleaner Production*, 182, 567–586.

<https://doi.org/10.1016/j.jclepro.2018.01.232>

Beck, A. L., Chitalia, S., & Rai, V. (2019). Not so gameful: A critical review of gamification in mobile energy applications. *Energy Research & Social Science*, 51, 32–39.

Bird, S., & Legault, L. (2018). Feedback and behavioral intervention in residential energy and resource use: A review. *Current Sustainable/Renewable Energy Reports*, 5(1), 116–126.

Buchanan, K., Russo, R., & Anderson, B. (2015). The question of energy reduction: The problem (s) with feedback. *Energy Policy*, 77, 89–96. <https://doi.org/10.1016/j.enpol.2014.12.008>

Delmas, M. A., Fischlein, M., & Asensio, O. I. (2013). Information strategies and energy conservation behavior: A meta-analysis of experimental studies from 1975 to 2012. *Energy Policy*, 61, 729–739.

Frederiks, E. R., Stenner, K., & Hobman, E. V. (2015). The socio-demographic and psychological predictors of residential energy consumption: A comprehensive review. *Energies*, 8(1), 573–609. <https://doi.org/10.3390/en8010573>

Michie, S., West, R., Campbell, R., Brown, J., & Gainforth, H. (2014). *ABC of Behaviour Change Theories*. Silverback Publishing.

Perski, O., Blandford, A., West, R., & Michie, S. (2017). Conceptualising engagement with digital behaviour change interventions: A systematic review using principles from critical interpretive synthesis. *Translational Behavioral Medicine*, 7(2), 254–267. <https://doi.org/10.1007/s13142-016-0453-1>

Eco-Apps for Change? Evaluating the use of mobile apps to promote and support sustainable lifestyles changes

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Digital Information Communication Technologies (ICTs) continue to profoundly affect how we work, live, and stay connected. Mobile digital devices have morphed from primarily voice apparatuses to multi-channel, internet-accessing, always-on, mini-computers that are employed across all age groups globally (Miller et al., 2021). As ownership and use of smartphones and portable digital devices surge globally (Turner, 2023), the widespread embrace of such technology has been simultaneously accompanied by the pervasive emergence of an 'apps culture' (Purcell et al., 2010) along with a sizable and growing market for mobile software applications (apps for short). All indications are that mobile app development and consumption will continue to grow and develop apace (Statista, 2021), creating a crowded marketplace (Appel et al., 2020). In the context of the intensifying climate crisis (IPCC, 2021), how can such digital technologies be best used to assist and support the crucial lifestyle and behaviour changes needed to address the human impacts of climate change?

This paper seeks to understand how such technology can be best leveraged to promote and support sustainable lifestyles through a two-pronged study. First, a review of existing literature in the areas of mobile digital app use in eHealth and pro-environmental change is undertaken to elicit lessons for encouraging lifestyle change through digital eco-apps. Secondly, we review data from novice eco-app users to consider what users find interesting, and frustrating, and what compels them to uninstall such apps from their devices. Through this review, attrition is identified as a particular challenge for supporting app-based lifestyle change, with users in this study indicating they would uninstall apps if they materially affect the running of their device or if the services on offer were irrelevant to their own needs. The paper concludes by offering guidelines and suggestions for best practice for encouraging sustainable lifestyle changes through digital applications. Insights from this paper have contributed the EU-funded Climate CAMPAIGNers (2022) project, which has developed an innovative eco-app, offers challenges to users seeking to reduce their carbon footprint and support climate neutrality. The project aims to be the mechanism for citizen-driven change in a way that is fully immersed in behavioural research and integrated with local, national and EU-level policy goals.

References

- Appel, G., Libai, B., Muller, E., and Shachar, R. (2020). On the monetization of mobile apps. *International Journal of research in Marketing* 37(1), 93-107.
- Climate CAMPAIGNers (2022). We are Climate Campaigners [Online]. Available: <https://project.climate-campaigners.com/> [Accessed 20 December 2022].
- IPCC (2021). "Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change". (Cambridge, UK: Cambridge University Press).
- Miller, D., Abed Rabho, L., Awondo, P., de Vries, M., Duque, M., Garvey, P., et al. (2021). *The Global Smartphone: Beyond a youth technology*. London: UCL Press.
- Purcell, K., Entner, R., and Henderson, N. (2010). *The Rise of Apps Culture*. Pew Internet and American Life Project (September 2010).
- Statista (2021). "Mobile app usage - Statistics & Facts". (New York, NY: Statista Research Department).

Turner, A. (2023). Number of Mobile Phones & Smartphone Users [Online]. New York, NY: BankMyCell. Available: <https://www.bankmycell.com/blog/how-many-phones-are-in-the-world> [Accessed 5 January 2023].

Digitalization –Friend or Foe of Sustainable Consumption?

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Digitalization is a megatrend affecting all ways of life, including consumption. Broadly speaking, three waves of digitalization can be distinguished in consumption: 1) the online shopping wave, 2) the participatory consumption wave, and 3) the virtual consumption wave. In our research, we ask what these waves of consumption have meant for sustainable consumption, and then flip the question to ask what a sustainable consumption future requires from digitalization. To answer these questions, we conduct a literature review concerning these three waves and their known consumption consequences. We support this literature review with real-world examples regarding consumption trends emerging out of these three waves.

We find that in the short term, the digitalization of consumption has resulted in more efficiency per item purchased or dollar spent, but also increased overall spending, both directly (through lower prices, lower transaction costs, and targeted marketing) and indirectly (through exposure to content that encourages consumption). On the other hand, indications start to appear that digitalization leads to changes in consumption behavior that could bear significant improvements for the sustainability of consumption, e.g. through the virtualization of consumption. This is partly supported due to the emergence of digital business models which are not reliant on sales of resource-intensive products.

Our findings also indicate consequential results in relation to power structures. On the one hand, consumers have gained market power compared to retailers and producers. On the other hand, new even more powerful actors – the internet giants controlling search, communication, and device access – have emerged as agents with even greater ability to influence consumer behavior. Their actions will be of decisive consequence for the way in which digitalization influences future sustainability of consumption.

We argue that undeniably, digitalization will shape consumption in the future, and can be a powerful force for more sustainable consumption, or an accelerating factor in harmful consumption patterns and levels. Policy-making will be of crucial significance to ensure a positive role of digitalization, not least to prevent the digital world to become a purely commercial space divided up into fiefdoms of a handful of digital behemoths.

Exploring the net effects of low-carbon behaviors using transaction data

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Building on previous work by Andersson (2020), this study uses the carbon footprint methodology of the Svalna app, estimating the greenhouse gas (GHG) emissions of individuals primarily by means of transaction data from their bank(s) paired with environmentally extended input-output data to provide a detailed account of expenditures and GHG emissions. The system also collects complementary data from official databases such as the national motor vehicle registry and additional self-reported data. This novel approach to carbon footprinting could be used to address a range of questions in consumption research; here, the aim is to evaluate the direct and indirect effects of low-carbon behaviors such as living without a car, not flying and having a vegan diet.

There are at least three potentially important mechanisms that may affect the net effect of different low-carbon behaviors: (1) economic rebound effects that counteract the initial reduction in carbon footprint through redirected spending in other consumption domains; (2) psychologically motivated spillover effects whereby a pro-environmental behavior in one domain may lead either to further efforts to avoid carbon-intensive behaviors in other domains i.e., positive spillover effects, or alternatively that the initial pro-environmental behavior leads to an increase in consumption in another domain, i.e., a negative spillover effects (moral licensing). In addition, (3) different behaviors may structurally interlinked, e.g., that living in a detached house outside the city center often also entails owning a car (or two). By empirically analyzing the indirect effects for individuals who are already implementing a low-carbon practice, the study sheds some light on the relative importance of these theoretical perspectives (Reimers et al., 2021).

In the first stage of the project, we used data from a sample of 715 current Svalna-users who had approved sharing anonymous data for research purposes. We only included historical transaction data from before the participants downloaded the app not to capture feed-back effects from the app itself. The mean carbon footprint from private consumption was 7.6 ton CO₂e/yr. Contrary to the theory of economic rebound effects, results from multivariate analyses, indicate that the studied low-carbon behaviors were correlated with lower aggregated emissions also in other domains (positive spillover), except for participants who did not fly, for whom we saw a very limited indirect rebound effect. As expected from a sample self-selecting into a carbon calculator, pro-environmental personal norms were relatively strong, which limits the generalizability of the results and calls for further research, especially since a previous study indicates that environmental motivation may mitigate economic rebound effects (Andersson et al 2019). Hence, to provide more robust results, the second stage of the project will involve the recruitment of a larger representative sample.

The results from the first part of the project are published in Andersson & Nässén 2023.

Andersson 2020: <https://doi.org/10.1016/j.jclepro.2020.120396>

Andersson et al 2019: <https://doi.org/10.1007/s12053-019-09823-w>

Andersson & Nässén 2023: <https://doi.org/10.1016/j.jclepro.2022.135739>

Reimers et al 2021: <https://doi.org/10.1016/j.clrc.2021.100032>

E04: Sustainability labeling: what do we know about the effectiveness of meta-labels for sustainable behavior change?

Session Chair: Maike Gossen, Johann Majer

Room: B: Omnia, R: Quantum 2 (max. 30)

How can multi-level labels effectively contribute to sustainable behavioral change? – Testing an alternative design of the German animal husbandry label

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Animal welfare is a key factor in reducing factory farming with its negative ecological impact and consumers' ethical concerns. On October 12, 2022, the German Federal Cabinet approved a draft for a mandatory national animal husbandry label that aims to help consumers to identify conditions under which the animal was kept and to compare different meat products based on this information. For this purpose, the husbandry conditions are categorized into different levels. However – similar to the current voluntary label – the label does not contain any information other than a name for each of the ordered levels.

Although the label can be easily perceived by consumers with such a minimalist design, the lack of important information may lead them to fall back on heuristics and implicitly make assumptions about the relationship between the levels. This could lead to biased consumption, as purchase decisions may not reflect consumers' actual preferences and compromise the label's supposed impact in supporting sustainable consumption.

What kind of information should an animal husbandry label contain to help consumers decide according to their preferences? In a study from 2020, we tested whether supplementing the existing voluntary label with information about its main classification criterion would lead to greater effectiveness. In a discrete choice online experiment with a representative sample from Germany (n=404) we analyzed consumer preferences and willingness to pay for pork meat. In a between-subject design, we presented products with four attributes: animal husbandry label, price, packaging, and regionality. To test our hypothesis, we experimentally varied the label. While the control group (CG) was shown the original label, the experimental group (EG) was shown a modified label with additional information on space available for each animal (in square meters) and a graphical image of pig and space.

Respondents from the experimental group chose significantly more products with the highest husbandry level (level 4) than the control group and significantly fewer products with lower husbandry standards (levels 1 and 2). Products of level 3 showed no difference. With the additional information, more participants opted for the products with the highest animal

husbandry standards, even if they were more expensive. This is also the case for price-conscious consumers.

This shift in market shares indicates that consumers cannot (fully) decide according to their preferences if they have to make assumptions due to a lack of information. Providing relevant information may support sustainable consumption, because consumers are able to compare products and conceive quality differences.

In addition to these results, we are currently working on a replication study using the German government's draft for the mandatory animal husbandry label. We are confident to be able to present additional results in a full paper by May 30 and at the SCORA initiative in July.

Meta-Sustainability Labels for Mobile Phones: Are Customers Willing to Pay for an Eco-Score?

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Sustainability information and particularly eco-labels offer promising means to support consumers in making sustainable consumption choices. However, the current sustainability labeling landscape is “up against the challenge of too much, too complex, too similar, and too ambiguous information”. Addressing these challenges, a meta-sustainability eco-score label ranging from A to E has recently been discussed in consumer research. In addition, research on consumer preferences for consumer electronics with an explicit meta-sustainability label is still limited and lacks insights into the influence of a hypothetical eco-score, potential (sustainable) market segments and willingness to pay (WTP).

Multiple attributes rather than products themselves provide utility to consumers when making purchase decisions. Following Lancaster's consumer theory this study aims at uncovering consumer preferences for an eco-score when purchasing mobile phones. Additionally, we aim to investigate consumers' WTP for different eco-score levels and provide in-depth insights into how sustainable mobile phones compete in realistic market scenarios and different market segments. This quantitative-empirical study applies an adaptive choice-based conjoint analysis as part of an online survey completed by a population-representative sample in Germany (n=534). Eleven attributes for mobile phones including a hypothetical eco-score label are tested alongside product lifetime information, information on fair production and trade standards as well as a series of conventional product attributes such as price. Hierarchical Bayes modelling is used to estimate the utility values of individual attribute levels. Cluster analysis is performed to identify potential market segments using socioeconomic variables and respondents' consciousness for sustainable consumption. Additionally, Lighthouse Studio (Sawtooth Software) is used to simulate respondents' WTP as well as preference shares of sustainable mobile phones in a realistic market scenario.

Higher levels of a hypothetical eco-score have a positive influence on the purchase of mobile phones. This effect is approximately linear, i.e. a utility gain from an eco-score level C to B is similar to the utility gain from B to A. The eco-score proves to be more important than all other sustainability-related product attributes tested in the form of information tags (e.g. “durable”). Four market segments can be differentiated: “price shoppers”, “brand and eco shoppers”, “new and equipment shoppers”, and the “average shoppers”. Making up a market size of 20%, brand and eco shoppers demonstrate the strongest preferences for all sustainability-related attributes. Statistical WTP analyses and choice simulation are not yet conducted. However, we assume

that eco-sensitive consumers are consistently willing to pay more for products with higher levels of sustainability.

Our study provides first empirical evidence for business practitioners (e.g. producers, retailers and search engines) and policy-makers to introduce an eco-score in the consumer electronics sector. The findings thus highlight how market actors can foster sustainable behavior change through meta-sustainability labeling. Furthermore, the study reveals unused market potential for sustainable mobile phones. Marketers may focus on eco- and performance-sensitive market segments by targeting their psychographic and socio-economic profiles.

(When) Do we trust sustainability labels? How certification labels and sustainability information affect credibility in online fashion consumption

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The global fashion sector as a major industrial source of environmental pollution and employment inequality is making recent efforts to increase sustainable practices (Lee et al., 2020), due to the shifting societal focus on more durable and circular systems (Colucci et al., 2020). However, with increasing awareness of consumers about sustainability issues like carbon emissions or labor rights, questions of credibility arise about sustainability communication (Cerri et al., 2018).

Despite positive effects of different sustainability signals on consumer responses found in previous studies (Hosta & Zabkar, 2021; Nayak et al., 2019), the inflated use of ambiguous sustainable messages adds to the image of greenwashing in apparel production (Niinimäki et al., 2020). Certain sustainable signals may also be perceived with skepticism, raising doubts about their credibility (Cho & Taylor, 2020; Kim & Oh, 2020), especially when incongruent with other product information (Brach et al., 2018).

Third-party certification, a guarantee provided by an official third party that sustainability conditions are followed (cf. ISO norms), is often adopted by sustainable fashion brands to verify their commitment to sustainable practices (Kaner & Baruh, 2022), and has also been established as a viable means to reduce consumer scepticism (Janßen & Langen, 2017). However, little is known about how consumers perceive different sustainability certifications, and how additional product information may moderate these effects on credibility about sustainability information (Majer et al., 2022).

Therefore, in two experiments, the present research examines the impact of different sustainability certification labels in interaction with the price and message framing on perceived credibility, as affecting sustainable fashion purchase intentions.

In a first experiment, the general effect of sustainable message framing for certification labels on perceived credibility is examined for 211 respondents, employing a 2 (sustainability label: absent vs. present) x 3 (message frame focus: sustainability vs. comfort vs. no message) between-subjects design.

Next, the effect of additional sustainability information for certified sustainable fashion at different price points on purchase intention as mediated by credibility is tested among 183 participants, using a 3 (no vs. general vs. certified sustainability information) x 2 (low vs. moderate price) between-subjects experiment.

Findings affirm the central role of label credibility in generating positive consumer response towards certification labels, yet reveal novel insights about the relative significance of certification information when compared to additional message framing and product price. More specifically, third-party certified label credibility increases sustainable intentions only through consumers' perceived product sustainability. In addition, product aspects like comfort or price seem less important as long as sustainability information is trustworthy for consumers. Accredited sustainability information thus increases purchase intentions, yet certification labels must be perceived as credible to increase sustainable consumption. This study offers valuable theoretical contributions to the sustainable fashion branding literature, as well as managerial implications for the implementation of sustainability signals in fashion branding.

E05: Disruptions in everyday life: Changing social practices & opportunities for sustainable consumption (2/2)

Session Chair: Claire Hoolohan
Room: B: Orion, R: B3031 (max. 52)

Coping with the energy crisis: How Danish households adjust, change, or abandon everyday practices

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For long energy research in the wealthy part of the world have shown that energy consumption is something happening unconsciously while performing ordinary everyday practices, and that awareness and prize of energy was not something most people, at least in the relatively prosperous and equal society of Denmark, was aware of. With the energy crisis in 2022 this can no longer be expected to be true, and new research questions arise: how do raising energy prizes and public discourses of energy crisis affect the everyday practices in different types of homes, and how do people in practice cope with the new situation? A qualitative study including household interviews form the background for an analysis of these questions. During the winter 2022-23, 30 households were selected for interviews and house visits to include three different types of households: 1) households who in this new situation can be considered, and conceeder themselves, energy poor, households having been interested in energy and climate already before the energy crisis, and households impacted economically by the energy crisis but not considering themselves (energy) poor. The research questions include investigating similarities and differences in coping strategies, and meanings and competences related to changes in everyday practices. Do the "same" practice change carry different meanings in different types of

households? How do social relations and ethics affect the coping strategies of householders? Does the energy crisis imply new types of status and distinction in performing energy reducing or consuming practices? Does the energy crisis carry with it signs of practice change towards sufficiency and new norms of a less consuming society? Analysis will be based on practice theoretical understandings, in a form where questions of social class, status and questions of ethical consumption are included.

How households and communities respond to disruptions and temporary scarcities of water provision – case examples from Austria

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Based on an ongoing interdisciplinary research project on the crisis management and resilience of water provision in Austria, this paper aims to shed light on the array of responses to disruptions of water provision and to (imagined) crisis situations in general with potential knock-on effects on water consumption and infrastructures.

Austria on the whole is a water-rich, or even water-privileged country, with generally highly reliable infrastructures of water provision and a high level of trust within the population. The ongoing and disruption-free provision of water is taken as a matter of course. While disruptions of water services do occur, they are mostly confined to specific locations and to relatively short time periods. However, certain parts of Austria – especially non-Alpine regions that rely on groundwater (instead of mountain spring water) sources – experience an increasing risk for temporary scarcities of water due to the effects of climate change, which manifests in declining yearly precipitation, extended periods of drought and falling groundwater levels. There are thus different types of potential disruptions, some of them sudden and unforeseeable, others approaching in a more piecemeal, regular and foreseeable way. The latter, in particular, turns water provision from a matter of course into a matter of concern (a ‘topic’). Water increasingly becomes an object of economizing by actors at various levels. It may also raise expectations of increasing scarcity in the future and of intensified conflicts over the distribution, or of temporary restrictions on the availability and uses of water resources. Aside from the water infrastructures, media coverage has also led to more widespread concerns about possible breakdowns of other large-scale critical infrastructures, for example due to a blackout.

The question that we address in this paper from a socio-technical and practice theoretical perspective is, what follows from existing experiences of disruption, from the imagined futures of water scarcity and from the increasing problematization of potential infrastructure breakdown? In what way are actors at various levels led to modify certain practices dependent on water and do these changes shift the production-consumption system of water into more or less sustainable directions? In contrast to other studies that focused on cases of fairly severe and/or large-scale water scarcities and restrictions, our analysis explores the effects of – until now – relatively mild disruptions of water services.

In particular, we address how private households, rural communities and towns

- a) responded to problems and disruptions of water provision in the recent past
- b) responded to global and societal crises of various kinds (e.g. Covid-19, energy crisis) with impacts on practices and infrastructures connected to water
- c) imagine and prepare for anticipated infrastructure breakdowns, shortages and disruptions of water provision (e.g. by either modifying social practices connected to water or by improving infrastructures to increase opportunities for intercommunal cooperation, water storage or hoarding in the private household)
- d) do not anticipate crises of such kind and hence do not adapt practices or infrastructures.

Our preliminary findings which are based on household level data of yearly water consumption of an exemplary town between 2019 and 2022; case studies of local communities with recent water issues; field research and interviews with private householders; supermarket data on consumer grocery (including water) shopping and hoarding instigated by lockdowns during the

pandemic. With respect to sustainability, we note ambivalent adaptations of practices and infrastructures, in particular due to the privatization of 'wellness' and home investments in water-related infrastructures during the pandemic.

Funding: The research project "RESIST" is funded by the Austrian Security Research Program KIRAS – an initiative of the Austrian Ministry of Finance (BMF)

Enabling experimentation in low-carbon holiday travel practices: Examining the outcomes of the Climate Perks initiative

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Flying is hugely emissions-intensive, contributing approximately 2.5% of global CO₂ emissions, and 5% of effective radiative forcing. The aviation sector has grown enormously over the past few decades, with no signs of growth slowing until the outbreak of Covid-19. However, participation in flying is distinctly uneven, meaning that these impacts are the result of actions undertaken by only a small proportion of the global population. Most people will not fly in the average year.

There is interest in identifying ways to reduce flying and shift from flying to low-carbon, land-based, travel. However to date, there have been few initiatives that have gone beyond education and awareness raising to enable these changes to occur. Climate Perks is an exception. It is a low-carbon travel initiative organised by Possible, a UK-based climate action charity. Climate Perks is an employee benefit scheme which enables employees to take low-carbon holiday travel, instead of flying; by providing paid 'journey days' on top of annual leave, the scheme allows employees to travel by slower, low-carbon modes without losing hard-earned leisure time. Launched in 2019, the scheme was heavily impacted by Covid-19 which halted international travel. Yet, as of January 2023, there are 65 employers offering Climate Perks, including charities, marketing agencies, architects and legal firms.

This research undertook an evaluation of Climate Perks, interviewing both employers and employees to understand how the initiative interacts with organisational and domestic practices. We sought to understand how, and to what extent, this employee benefit is impacting holiday travel, and why employers are signing up to the initiative, given that holiday travel falls outside the usual scope of organisational emissions accounting and environmental concerns.

We found Climate Perks being used to replace flights for other modes of transport, and not only for people that are otherwise motivated or committed to doing so. We found Climate Perks enabled a wide variety of people to participate in low-carbon travel, and using it to support journeys to different destinations, for a variety of holiday purposes, and by different modes. However, we also found that people's experiences using the scheme highlighted sources of friction for future low-carbon holidaying.

We discuss these findings and reflect on their relevance within wider research on low-carbon holiday travel.

Shared Mobility Practices and Imaginaries: The Amsterdam BuurtHub Project as temporary disruption of mobility infrastructure

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This paper aims to offer further insights into the change of practices and possible sociotechnical imaginaries behind shared mobility in the case of the Amsterdam BuurtHub project. In this project, shared e-mobility hubs are temporarily placed in neighborhoods throughout the city. These hubs are on-street locations where various modalities of shared mobility are clustered. This allows citizens to experiment with different shared mobility options for their day-to-day mobility needs.

The research question is: How do mobility practices, including meanings and imaginaries that users, operators and planners attach to them, change when shared mobility is, at least temporary, embraced?

We used social practice theory (i.e. materials, competencies, and meanings) combined with the concept of sociotechnical imaginaries, which helped to understand entanglements between the three most important stakeholders involved in the BuurtHub project: the municipality, shared mobility enterprises, and the citizens using the hub.

Concerning method, we did 21 user- and stakeholder interviews (13 users, 5 municipality, 3 mobility operators). Additionally, Living Lab sessions and policy documents were analyzed. Regarding the material dimension of shared mobility, we found that different vehicles encourage different types of use. For instance, a cargo bike can be a convenient option to transport large items during rush hour, and a shared car comes in handy when visiting family in a different city. The main material difference between using private and shared mobility has to do with using an app to lock and unlock a vehicle and reserve and pay for a trip.

This digital dimension also brings about the largest number of new competencies necessary for using shared mobility. Users who describe themselves as not so tech-savvy report experiencing the technological side of shared mobility as a threshold. Furthermore, shared mobility requires a new way of thinking about traveling: trips are less spontaneous and need to be planned in order to pick up and return the shared mobility vehicle in time.

As for the meanings ascribed to shared mobility, we see that users deem shared mobility fitting to their lifestyle, as it is in accordance with their values and ideals. Respondents describe finding sustainability important, as well as participating in the shared economy movement.

Policymakers must be cautious of shared mobility not becoming an end in itself, as opposed to a means to bring about a more sustainable mode of transportation. As we have seen, the current effects of shared mobility on car ownership remain limited. Shared mobility does have the potential to make mobility more sustainable, but for this, more and, most importantly, different user groups need to adopt the practice.

This research has implications for the study of mobility transitions. Most importantly, the use of the SPT model in combination with sociotechnical imaginaries has proven to be a productive approach to analyzing how practices are established and transformed over time, as well as what visions lie behind the adoption of certain practices, since we see a significant overlap between visions of users and other stakeholders.

Everyday life in a Pandemic: Disruption as a lens for studying practice dynamics

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This presentation situates the session 'Disruptions in Everyday Life: Changing Social Practices and Dynamics of Consumption' conceptually in the context of practice theoretical research on consumption. We offer a brief overview of the conceptual state of the field highlighting the specific opportunities afforded by studying practices during crises and disruptive events for generating insights concerning the dynamics of practices and addressing some unanswered questions in the field. Following this, we provide an overview of key contributions of current research according to five key themes that advance insights concerning the dynamics of practices. We unpack insights into how and why practices change, as well as the policy implications emerging from this across five key themes of conceptual, empirical, and methodological relevance for the field. These include connections, variation, culture, history, and methodology. In discussing each of these themes we highlight lacunas in understanding that recent work seeks to address and reveal some of the contributions they make in doing so. We conclude with a discussion on the unfinished business of studying interconnected practices in flux and offer reflections and directions for further inquiry.

E06: Protein Transition

Session Chair: Barbara van Mierlo

Room: B: Omnia, R: Quantum 3 (max. 30)

The representations of sustainability and the food system carried by discourses on alternative proteins on Instagram

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Climate change will have major consequences on food production and consumption caused by the effects of the environmental crisis themselves, as well as mitigation and adaptation measures. Given its high environmental impact and ethical concerns regarding animal well-being, meat consumption and animal agriculture will be particularly affected. In this context, meat-free diets and plant-based proteins have been gaining traction. Alternatives to meat can include animal-based protein sources, for example dairy and eggs; plant-based products, among them legumes or tofu; ultra-processed foods and technological innovations, such as plant-based or lab meat; and cultural innovations like insects. All these products are marketed to different segments of consumers – “flexitarians”, vegetarians, vegans, or omnivores keen to try new foods – in a context where the discourses on meat consumption tend to be tensed and emotionally charged. Through advertising, packaging, marketing and various communication techniques, stakeholders promoting alternative proteins take part in the development and diffusion of these discourses, which are shaped by competing moral values relating to animal well-being, ideals of free choice in a liberal market, and the role of individuals in the answer to climate change, among other things. These discourses are also central to the formation of social representations and meanings involved in the emergence and performance of food consumption practices.

To better understand the discursive field within which people come in contact and eventually adopt alternative proteins, this project aims at mapping the social representations of alternatives to meat, the tensions between them, the products they are associated to, and the actors involved. To achieve this, we engaged in the collection and qualitative analysis of more than 800 Instagram publications by a variety of actors of the food value chain that seek to influence meat consumption, the most important being producers, processors, retailers, restaurants, associations promoting vegetarian or vegan lifestyles, media personalities, and influencers. The choice of collecting data on a social network centered around images is based on the visual nature of communications and marketing relating to food and meat consumption. The analysis unveils the competing representations that are carried by these discourses, as well as the actors that contribute to shaping these representations. The main ones concern sustainability, health and the body, and the relationship between humans and non-humans.

This paper will focus on the representations of sustainability, including discourses on sustainable food systems and what they should be, which themselves are tied to representations of technology and nature, among others elements. These representations are also influenced by power relations, economic interests, and the political economy of meat, alternative proteins, and food more generally. This invites to a reflexion on the role of various actors and stakeholders in shaping the social representations that contribute to the development and performance of food consumption practices.

The protein transition: a silver bullet missing a target?

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The protein transition is both a subject of political discussion and a hot topic for large companies' strategy. Presented as a solution to the problems resulting from animal protein overconsumption and overproduction in high-income settings, the appropriation of the concept by actors of various sectors, including the state, market, and non-profit sector, has brought the protein transition to the border between a techno-centric and a politico-centric transition.

Based on a comprehensive literature review, we identified i) a diversity of definitions and interpretations of the protein transition, ii) the key challenges that it promises to address, and iii) claims associated with the protein transition outputs. We identified different narratives describing how to proceed with the protein transition (i.e., the driver of change, the target(s), and the potential transition pathways), showing that these narratives are embedded in different scientific paradigms, consisting of varying transition trajectories.

A key issue emerging from this process is a lack of integration between the production and consumption side.

The protein transition is mainly defined from a consumption perspective, implying a dietary shift from a diet with high animal protein intake towards more alternative protein intake. Only two articles include a production dimension in their definitions. The review allows us to highlight a lack of perspective on the future of protein production, especially animal protein. Articles either focus on consumption-based solutions, including animal-based product replacement or substitution, thus nurturing a consumer-driven protein transition, or on solutions targeted towards developing alternative proteins for feed and food, thus promoting a techno-driven protein transition. Solutions targeted towards an agri-food system transition are rarer.

The protein transition is promoted as a solution to three main challenges, namely i) environmental impacts of protein production and consumption and the overshoot of planetary boundaries, ii) the need to feed a growing population and provide healthy diets, and iii) impacts of industrialized and/or intensive livestock production systems. If opting for a consumer and techno-driven protein transition may contribute to the target, we argue that it will probably not be sufficient. Embedding these solutions in a systemic approach, including production and value chains, will be necessary to challenge the current meat regime.

Friend or foe in sustainability transitions? The interplay of diversity and directionality in the Wageningen-based Alternative Protein Innovation System (APIS)

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Literature on mission-oriented innovation policy and mission-oriented innovation systems has highlighted the necessity of clear 'directionality' when it comes to achieving transitions to more sustainable modes of production and consumption. Directionality is created by actors across the value chain and the wider network in attempts to shape transition pathways. Simultaneously, literature on diversity in transitions has stressed the need of keeping diverse directions open while warning for early lock-ins and path dependencies. Like directionality, diversity is also created by innovation system actors in order to tackle the complex and uncertain nature of sustainability transitions. We aim to show how socio-technological processes related to the protein transition are shaped by differing dynamics across scales, thus resulting in a complex constellation of diversity and directionality in a mission-oriented innovation system. We conduct a qualitative single-case study of the Wageningen alternative protein innovation system (APIS) by means of 35 semi-structured interviews. The research question is as follows: How do diversity and directionality unfold in a mission-oriented innovation system? We focus on the Wageningen APIS in order to provide insights into the types of socio-technological trajectories actors are pursuing in alternative proteins and how different selection environments shape each solution trajectory. We observe that the Wageningen APIS is composed of a strong mission of a 'Protein Transition' and exhibits a clear directionality towards meat substitutes. Yet, our results show that underlying this direction several diverse transition trajectories coexist due to factors such as researchers' personal interests and competences, networks, expected consumer preferences, and global future visions.

Framing for the Protein Shift: eight pathways to foster plant-based diets through design

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The scale at which our society is currently consuming meat and dairy is urgently unsustainable and unjust, which has led to calls for a protein transition. Plant-based diets can be fostered by design interventions, yet the way such interventions exert their influence depends on the framing that is chosen. A 'design frame' comprises of a societal issue, a behavior change mechanism and a worldview, and is embedded in design interventions. The aim of this qualitative study was to understand which design frames are currently prevalent in existing interventions that challenge the food system, thereby accelerating the protein transition, to identify opportunities for reframing and find novel avenues to foster the transition. This interdisciplinary work explores framing at the intersection of transitions and design research. We collected 62 existing design interventions and held eight in-depth interviews with experts. We applied a thematic analysis with the design frame as the unit of analysis. Through constant comparison between the interventions and the interview data, we arrived at a set of eight design frames through induction: (1) Tasty Doppelgangers, (2) Silent Steering, (3) Gentle Guidance, (4) Be the Transition, (5) Shifting Meaning, (6) Cracking the Discourse, (7) Changing the Rules of the Game and (8) Beyond the Anthropocene. We observe that the Tasty Doppelgangers (characterized by the 'meat analogues') are currently dominating the protein transition. We also notice that some design frames fundamentally disrupt the cultures underlying the food regime, suggesting that these might have more transformative power than other design frames. We see that some interventions fit multiple design frames, indicating that these interventions apply a variety of change mechanisms and might therefore be more effective. We notice that some design frames are complementary to one another, while others are in competition with each other. Nearly all interventions exclusively support people who are already willing and able to make a change, upholding inequality in the food system. Future research could explore the transformative potential of design frame combinations. Practitioners are invited to look beyond the Tasty Doppelgangers and to develop a reframe focusing on inclusivity.

System archetypes of the food environment: a systematic literature review to identify barriers and enablers of the transition to more plant-based diets

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In western countries, increasing consumption of plant proteins and reducing animal protein intake is essential to improve public health and enable more sustainable food production. Many explanations for the consumption of either animal- or plant-based proteins as affected by the food environment have been reported in literature; yet underlying system structures of these interactions are poorly defined. This lack of understanding of the dynamics between the food environment and food practices hampers and hampers the transition to more plant-based diets. This systematic literature review aims to identify barriers and enablers of the transition to more plant-based diets by extracting variable relationships from literature and creating system archetypes of the food environment. System archetypes are dynamic phenomena expressed as causal loop diagrams (CLDs) that occur repeatedly in diverse settings. Examples include: a supply-and-demand archetype for supply of meat and consumption of meat; the drifting goals archetype for flexitarians trying to reduce meat intake but feeling pressured by meat-eating peers to continue meat consumption; the fixes that fail archetype about marketing for meat analogues that strengthens the focus on meat consumption.

While system archetypes have been used in various fields, methods for synthesizing current knowledge into systemic presentations are underdeveloped. As a second aim, this study seeks to address the knowledge gap in systemic synthesis from literature by exploring solutions to enhance transparency and reproducibility in the construction of CLDs.

The review follows a complex systematic review approach, incorporating mixed methods and considering multiple perspectives within the food environment. Selection of literature occurred in several stages using the PRISMA-P template for reporting results of a systematic review.

Screening of titles and abstracts was performed in ASReview, a machine learning framework for efficient and transparent systematic reviewing. The systematic literature search identified a total of 68 articles meeting the eligibility criteria. These articles were assessed for methodological quality using predefined criteria for different study types. Labels used in coding the data are based on publication standards of a realist evaluation (RAMESES) and system vocabulary. Variables and their relationships were organized using a glossary of variables that was developed during another study (Blokhuis et al, in prep).

The identification of system archetypes and the characterization of variable relationships will serve as a valuable guide for future research aiming to understand the transition to more sustainable and healthier diets.

E07: Systemic solutions for avoiding packaging waste (1/2)

Session Chair: Elisabeth Süßbauer
Room: B: Omnia, R: Spectrum (max. 30)

How is progress in packaging waste prevention measured? Trends and gaps in existing indicators from the German food retail sector and European national waste prevention programs

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Packaging waste generated in the European Union in 2020 varied from 66.0 kg per inhabitant in Croatia and 225.8 kg per inhabitant in Germany (Eurostat 2022). As a constantly growing waste stream, packaging waste has become a major environmental issue for many countries worldwide (Tencati et al. 2016). The use of packaging is often still based on a linear model: production, consumption and disposal, resulting in significant use of raw material, amounts of waste, and impact on our ecosystem (Zhu et al. 2022; Seresova et al. 2020). This contradicts the goal of substantially reducing waste generation by 2030 (UN 2017). To monitor progress towards circular packaging and to set and track waste prevention targets, appropriate indicators are needed.

In this context, the objectives of this paper are: (1) to propose a framework for characterizing packaging waste prevention indicators, (2) to apply and discuss the framework with existing indicators from the German food retail sector and (3) European national waste prevention programs, and thus (4) to contribute to the further development, evaluation and harmonization of indicators for the prevention of packaging waste. This involves answering the following research questions:

- What indicators are currently used to assess packaging waste prevention?
- How do they measure progress in waste prevention?

For this purpose, a framework is established that specifies the requirements for indicators to measure progress in waste prevention for packaging. Subsequently, two case studies are conducted. Firstly, to identify waste prevention indicators from programs, reports and other publications of companies in the German food retail sector and to determine their characteristics, and secondly, to evaluate European national waste prevention programs using a similar approach. In conclusion, the findings and identified gaps regarding waste prevention indicators are discussed.

Analyzing Industry Perceptions of Biobased Plastic Packaging Products

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Fossil-based plastic packaging has been related to issues such as high carbon footprint, human and animal health and safety issues, pollution related to waste management. Due to these issues and the public and political pressure, innovative alternatives for packaging such as the bio-based plastic packaging are being produced and promoted. Even though bio-based plastic packaging products have some advantages over conventional plastic packaging and seen as sustainable alternative products, they also create economic, environmental and social sustainability issues. There is a growing literature on these sustainability issues and the criticism towards biobased plastic packaging increases. How the sustainability professionals or managers working in the industry manage these issues depending on how they perceive them. The aim of this study is to firstly analyze industry stakeholders' knowledge of the sustainability issues of biobased plastic packaging that are being discussed in the literature, secondly to analyze how they make sense of the sustainability of their products and thirdly to explore their archetypical responses to these issues. Semi-structured interviews are conducted to 14 international companies working in the biobased plastic packaging sector in different supply chain stages and interview transcripts are analyzed through discourse analysis. The paper builds on a comprehensive critical sense-making analysis of the interview data supported by the secondary data sources such as company websites. The results of the study show that most of the interviewees are aware of the sustainability issues that are being discussed in the literature. The results also indicate that there are great variations on how interviewees perceive these sustainability issues and how they make sense of the sustainability of their products as well as how they take actions to tackle these issues. 3 archetypical responses are found in the main classifications of how they make sense of their products: defensive, pragmatic and strategic. 6 main responses were found on how they manage these sustainability issues.

The potential of collective action for domestic packaging waste prevention – insights from an intervention study with German households

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To tackle the waste crisis, there is a serious need for decisive and joint action at different levels. Normalising precycling behaviour in households, such as rejecting single-use packaging, reducing packaging waste and reusing packaging, could contribute to this (Klug and Niemand 2021). However, as previous studies have shown, the mere appraisal of the crisis does not result in stronger pro-environmental action, amongst other things because of habits, social factors, and the situational context (Heidbreder et al. 2019; Wiefek et al. 2021). Decisions on where to buy food or if sustainability criteria are taken into account is for example regularly negotiated with other household members or within non-household groups such as friends, colleagues or neighbours (Wenzel and Süßbauer 2021). While the role of group relations and social identity processes has been analysed for other environmental fields such as climate protection, respective research on the topic of waste prevention is missing. Most of all, there is a lack of quantitative assessment of intervention effects and a need to examine the long-term impact.

To address these research gaps, a multi-group intervention study over the course of six months – called ‘Precycling HomeLabs’ – was designed and tested with approximately 100 households in Berlin, Germany. The HomeLabs were conducted as a field experiment with two intervention groups and one waiting control group. Aspects of social identity were addressed and stimulated by framing the HomeLabs as a collective project, for example by a motivating flyer (‘Berliners become active for packaging avoidance’), mirroring the group members’ precycling friendly norms during a ‘kick off webinar’ (Fielding and Hornsey 2016) and communicating the reduction of packaging waste during the study as a collective action goal (Fritsche et al. 2018).

Participants of the intervention groups took part in four webinars on different topics with the opportunity to discuss these topics with experts. Participants of intervention group 2 additionally received a ‘precycling starter kit’ with reusable containers and a pre-structured workbook: amongst others, they were asked to experiment with different reuse solutions and to document these experiences through photos, drawings and writing. Further, participants of this group participated in online discussions exchanging their experiences with other HomeLab households. Effects were measured by an online survey as well as by ‘packaging diaries’ that were taken at three to four time points in each group between May 2021 and November 2021. Due to the COVID-19 pandemic, interventions and measures took place virtually.

Data analysis of the online survey shows that the interventions did not result in significantly increased or changed precycling behaviour when comparing the different group conditions. In contrast to the general precycling, the intervention had an effect on reuse behaviour in group 2. Participants reported a notably higher reuse behaviour after the intervention period. This indicates that both the material intervention as well as the social group processes might have influenced reuse behaviour. Future intervention studies might investigate these approaches in separate groups to examine the role of collective action for the prevention of domestic packaging waste.

Path dependencies as economic barrier for waste prevention: How does the complexity of waste prevention hinder waste preventing business models?

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Various reports have highlighted the cost saving potentials of reusable packaging solutions (e.g. Systemiq 2021, WWF 2022): Reuse is normally characterized by higher investment costs that should be compensated after a certain number of use phases, from an environmental as well as economic point of view. Reduced production costs and avoided costs for disposal typically outweigh necessary efforts for transportation and cleaning. But despite these economic assessments, reuse is still a niche phenomenon and even in countries in Germany with an obligatory reuse quota in the packaging law way below these targets (42% instead of required 70%) and over the last years rather decreasing. This paper addresses this seeming contradiction: Why do companies still focus on single-use packaging solutions if reuse could be an economically superior solution? It applies the analytical framework of “transaction costs” (North 1992, Williamson 1981) - costs of gathering information, negotiating contracts and monitoring their implementation - in order to explain how the complexity of waste prevention and reuse specifically leads to a market equilibrium that still favours single-use solutions. This hypothesis is tested by a combination of quantitative and qualitative approaches: It analyses different case studies of companies that aimed to implement waste prevention solutions into their businesses (increased use of recycled materials, reuse, offering of unpacked goods). These insights are combined with outcomes of an empirical survey using economic incentives for consumers to use reusable packaging solutions; inter alia testing their willingness-to-pay and the shadow price of time as explanatory variable for the observed path dependencies in the packaging market. Based on these results the paper draws preliminary conclusions on possible options to reduce transaction costs for companies as well as consumers and thus to increase the market share of reusable packaging. This includes an improved standardization of reuse as well as digitalization of reuse at the interface of retailers, consumers and redistribution logistics.

E08: Networks and Movements as Drivers of Sustainability Transformations

Session Chair: Shirin Betzler, tbc

Room: B: Omnia, R: Momentum 3 (max. 30)

Are you looking for deceleration or transformation? – Investigating the role of temporal orientation for collective sustainable engagement

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Problem statement: To tackle the challenges of the climate crisis, the importance of collective approaches that go beyond individual behavior change is increasingly stressed and oftentimes associated with transformative potential for paving the way to a more sustainable future (Amel et al., 2017; Bamberg et al., 2018). These collective efforts can take on different forms ranging from engagement in sustainable communities (e.g., eco-villages, community supported agricultures) to engagement in social movements (e.g., Fridays For Future, Extinction Rebellion). Motivations to join collective sustainable engagement is similarly diverse varying between past-oriented values such as deceleration, nativeness and simplicity (Autio et al., 2013) and future-oriented values such as transformation and societal change (Milfont et al., 2012). So far, there is little research that systematically investigates how motivational factors differ between these different forms of collective engagement. Understanding how these factors influence the attractiveness of sustainable engagement can help these communities and movements in gaining members and unfolding their transformative potential.

Research questions: The present study aims to systematically investigate the motivational factors behind different forms of collective sustainable engagement. Past-oriented values are expected to relate more strongly to engagement in sustainable communities, while future-oriented values are expected to relate more strongly to engagement in social movements. Moreover, hypothesized relations between personality dimensions and different forms of collective sustainable engagement as well as hypothesized relations between value dimensions based on Schwartz and different forms of collective sustainable engagement will be tested.

Theoretical approach: Preliminary work by the authors in the context of German community-supported agricultures supported the development of a framework on the relation between varying temporal orientations and sustainable engagement. Based on this framework, the role of temporal orientations as well as personality and value dimensions for different forms of collective engagement will be explored.

Methods: An online survey was administered. Respondents first answered to items measuring their temporal orientation (future and past orientation), personality dimensions (e.g., extraversion, agreeableness) and value dimensions based on Schwartz (e.g., altruistic,

hedonistic, biospheric values). Then, respondents indicated if they were currently part of a sustainable community or a social movement. If affirmative, they further indicated which form they were engaged in. If negative, they were asked to indicate if and which form of sustainable engagement they could imagine joining.

Findings: Results on systematic relations between participants' level of future and past orientations and the engagement or intention to join different forms of sustainable engagement will be presented. Furthermore, relations between personality and value dimensions and different forms of collective sustainable engagement are reported.

Conclusions and Implications: The present research aims at unraveling the factors that motivate different forms of collective sustainable engagement. Thus, the results offer guidance for sustainable communities as well as social movements to specifically target potential members and emphasize either past- and individual-oriented values or future- and society-oriented values in their establishment and the acquisition of new members. This is important to foster the transformative potential of sustainable communities as well as social movements.

Translating transformative discourses into transformative changes: what role can partnerships in rural landscapes play?

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The challenges for rural landscapes are immense, especially in densely populated delta areas. While there is a call for sustainable production of food and other agricultural products at a European and National level, the realization of sustainability transitions in agriculture in the Netherlands is lagging behind. In response, the Dutch government increasingly stresses the importance of so-called area-based approaches to tackle challenges such as biodiversity loss and deterioration of water quality, as exemplified by the government's current approach to the nitrogen crisis. This area-based approach is taken up and supported by partnerships at the local level, such as Greenports, but also at the national level, such as by the Deltaplan Biodiversiteitsherstel. When the responsibility of implementation of transitions is partly handed over to partnerships, it is important to understand whether and how these partnerships translate transformative ambitions at the European or state level to their landscapes and ambitions. In this research, we focus on 4 landscape-oriented partnerships active in one specific agricultural landscape: the Dune and Flower Bulb Region in the Netherlands. This area is renowned for its production of flowers and flower bulbs and is considered an important region because of its cultural heritage and economic significance. However, being located in one of the most densely populated areas in the Netherlands and encompassing a Natura 2000 area, the future of agriculture in the area is uncertain, especially because of the negative impact flower production can have on the environment.

As part of a Living Lab for Rural Biodiversity, we examine how landscape-oriented partnerships translate broader discourses on (rural) nature and agriculture into their ambitions and what this means for agricultural transitions in the area. To study this, we use an argumentative discourse analysis, based on interviews with governmental actors, partnership participants, nature organizations, farmer organizations and farmers, participant observation in partnership meetings, and partnership and policy documents. Our preliminary analysis shows that on the regional level, there are two main themes partnerships focus on: the reduction of pesticide use and the (re)development of landscape elements such as hedgerows. When scrutinizing the way partnerships deal with these themes, two things become clear. First, while transformative intentions are widely shared on higher levels, regional partnerships seem unwilling to advocate for or work on more transformative approaches. For example, while reducing pesticide use is 'acceptable', discussing the abolishment of pesticide use or questioning the sustainability of flower production in itself is unacceptable. Partnerships rely on support from powerful actors, such as the agro-industrial companies, but also on the cooperation of farmers, and therefore resort to approaches that do not harm vested interests. This dependence on powerful actors seems to enable partnerships to contribute to the necessary transformative changes in rural landscapes and leaves us with the question of whether we should put this burden and responsibility on the shoulders of regional actors.

The political interrelationship of translocal networks and commons based initiatives on food and energy nexus

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Over the last decades, most parts of the world have been suffering multidimensional and combined crises, such as social inequity, financial crashes, climate change, pandemics, military conflicts and discredit on democratic institutions. In this sense, community-led and commons-based initiatives (CBI) came to be significant alternatives to move towards more distributed, accessible, human scale and decentralised power (Angelis, 2017; Hardt & Negri, 2009). These movements are challenging how to create spaces of communal, self-provider, proximal and fair value chain in the centre of complex capitalist culture and succeeds with innovative commons governance reframing the urban patterned imaginary. In this same path, translocal networks are emerging all around the globe (Avelino et al., 2020) as self-organised networks – that are neither markets nor states, concurrently transnational and localised – with multiple-levels of governance enhancing members' participation in international collective environments, enabling more hybrid institutionalized ecosystems (Ostrom, 2007) beyond borders and simultaneously nurtured by local actions. Preliminary, we can see that translocal networks can play a pivotal role supporting CBIs to achieve political resilience in the long term.

Tuning the analysis, this work is focusing on energy and food commons-based initiatives and investigating the possible interaction between them through the food-energy nexus lenses (interdependence and efficiency between these two resources towards a more holistic governance). Food commons, in short, can be understood as collective mechanisms emerged from people's necessities for 'de-commodification', sustainability and 're-commonification' of food systems (Viveiro Pol, 2019) embedded in community relationship, for instance, community land trusts, community-supported agriculture, prosumersism and food policy councils. The energy sector is also highly centralised in market-driven institutions, extremely unequal in terms of social innovation (Gregg et al., 2020) and one of the most polluting human activities. The rise of 'prosumerism', Distributed Energy Systems, coproduction, hybrid institutional arrangements and renewable energy communities calls for another governance and institutional approach, in which the acknowledge of energy commons emerges as an umbrella to a more participative, inclusive, cooperative and flexible design (van der Horst, 2008). This is challenging the political frame of energy systems by empowering local governments, communities, and civil society to control energy production, consumption and distribution locally (Acosta et al., 2018; Wittmayer et al., 2021, Wolsink, 2020).

Therefore this work is focused on understanding the political interrelations developed from the interactions between CBIs and the translocal networks analysed through food and energy initiatives in two different regions: in Belgium and Emilia Romagna (Italy). Both regions are preeminent clusters of CBI projects with local government engagement and public policies experiences (and higher expectation for future development), however contrasting in several aspects such as organisational model, culture, development historic and outcomes, amongst others. This research is an ongoing project based on extended literature review, the consultation of policy documents in different scales, organisations' documents and on field work observation with in-depth interviews (of commons based initiatives, networks and other key stakeholders).

When do voluntary consumer organizations fail and when do they succeed? An analysis of success and failure in sustainable consumption

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In recent years, it has become increasingly apparent that perceived drawbacks within society are leading to self-organization of citizens in the public (Priemer/Krimmer/ Labigne 2017). There is an increasing dissolution of the boundaries of consumption as consumers are increasingly volunteering in formal and non-formal organizations (Kenning/Lamla 2018). These organizations promote consumer participation in socially relevant issues, one of which is the field of sustainable consumption. While the activation of consumers can be understood as a form of expression for a democratic society, consumer participation organized collectively and also serves the individual to the extent that it can promote participation in society, social decision-making and decision-making, but also one's own competence development and social networking (Simonson/Vogel/Tesch-Römer 2016).

More and more organizations have emerged in recent years that seek and want to demonstrate alternative paths to more ecologically sustainable consumption. They are of social importance in this context, as they attempt to close gaps in the area of sustainable consumption in which politics has so far been little or not at all active. These organizations can take various forms, such as community gardens, energy cooperatives or repair cafés, all of which are mostly run by volunteer consumers.

Although there is a great social and political interest in sustainable consumption, these organizations are often confronted with challenges in practice. There is a lack of action knowledge on how the organizations can meet challenges. It is precisely this necessary action knowledge that is highly relevant in view of the critical societal functions that consumer organizations have increasingly assumed in the area of sustainable consumption, and also seems acute in view of the organizations that are confronted with challenges in practice, sometimes threaten to fail because of them, or even have already failed.

The purpose of this presentation and paper is to explore what success/ failure mean for consumer organizations and when are these organizations successful? What (structural) obstacles do the organizations face? How can politics and society support such organizations? In order to answer these research questions, three focus group interviews were conducted with an average of 4 participants per focus group. In addition, an online study with N=88 participants was conducted to test and validate the results of the interviews. The results show that member motivation and commitment, community processes, identification with the organization, public relations, and cooperation and networking measures have a promoting effect on organizational success, while internal disagreements, lack of long-term employee commitment, and political restrictions promote failure.

Literature

Kenning, P. & Lamla, J. (Hrsg.). (2018). *Entgrenzung des Konsums – Dokumentation der Jahreskonferenz des Netzwerks Verbraucherforschung*. Wiesbaden: Springer Gabler.

Priemer, J., Krimmer, H. & Labigne, A. (2017): *ZiviZ-Survey 2017. Vielfalt verstehen. Zusammenhalt stärken*. 1. Auflage. Berlin: Edition Stifterverband.

Simonson, J., Vogel, C., Ziegelmann, J. P. & Tesch-Römer, C. (2017). Einleitung: Freiwilliges Engagement in Deutschland. In: J. Simonson, C. Vogel & C. Tesch-Römer (Hrsg.). Freiwilliges Engagement in Deutschland – Der Deutsche Freiwilligensurvey 2014 (S. 31-49). Wiesbaden: Springer VS.

Zero Waste Consumption Behavior: Practices and Products

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An effective waste management system is much more than just recycling and is composed by efforts from public administration, companies and civil society, the so-called consumers.

Between other actions beyond recycling, the conscious choice of not consuming a certain good or service may have much more complex meanings than simply individual preference. Within the line of Consumer Culture Theory there are studies dedicated to exploring anti-consumption and resistance to consumption behaviors that deserve to be deepened studied, because they cause significant positive changes to society, especially in terms of environmental sustainability.

Among the various niches that exist within sustainability, one of them is portrayed by the consumers of the Zero Waste community. They present specific behaviors, are institutionalized, are present in the five continents, and are agents of change in the current society permeated by disposable plastics. Amidst this context, this article sought to explore some of the motivations, behaviors, consequences, and moderators of Zero Waste movement individuals and collectives. To this end, ethnography was used to triangulate the views obtained through 3 years participatory observation, interviews with key actors of the Zero Waste movement in the south of Brazil, and secondary literature analysis. As results, this research is useful for the debate and popularization of knowledge about alternative ways of consumption that enable the construction of public policies, creation of innovative sustainable businesses and mitigation of negative externalities to the environment, it was found that the movement causes implications at the micro, meso and macro levels. As practical and scientific implications was observed that specific actions against the use of disposable products or practices are the hallmark of the movement; the female audience is predominant; mothers play an important role in coordinating behavioral change to resist consumption; there are many controversies and possibilities of exploring the theme either by the academia or by entrepreneurship.

E09: Interventions to Change Consumer Behavior - Evidence from Experimental Research (2/2)

Session Chair: Sophie Boerman

Room: B: Atlas, R: Atlas 2 (max. 80)

Green and (un)ethical? Pro-environmental behaviour and the willingness to externalise costs.

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Identifying and clustering consumers according to their environmentally friendly behaviour is common in sustainability as well as marketing research. However, these studies usually examine the negative side only in an indirect way (as a lack of pro-environmental behaviour), without explicitly discussing the negative externalities generated by un-sustainable consumption practices. This could be problematic, because it has been shown that the factors that inhibit negative behaviour are not necessarily the same as those that promote positive behaviour (and vice versa), and thus the same people who engage in positive actions may also engage in negative ones. Our study adopts a novel approach where alongside pro-environmental behaviour, we also directly examine people's willingness to make decisions that, while beneficial to themselves, lead to extra costs for others, a phenomenon we call the willingness to externalise costs (WTE). By making the damage to others explicit, the concept of WTE takes on a clearly ethical dimension that people may not always think of when making their everyday consumption decisions. Our study intends to (1) collect typical measures of green attitudes and behaviours used in studies of clustering consumers; (2) introduce the concept of and develop a measure for the willingness to externalize cost (WTE); (3) map all the above measures to determine typical patterns; and (4) cluster a sample of university students. Our research is based on a survey carried out on a large sample (N=3669) of Hungarian business BA students that included questions on various elements of a sustainable lifestyle (e.g. saving energy, consumption of meat and organic food, transport habits, recycling, buying used clothes, etc.) and scenarios testing respondents' willingness to externalise costs (would respondents use an app that enabled them to gain a large sum of money if this resulted in a loss of a tiny sum of money for a large number of people)? The data was analysed via principal component analysis, multidimensional scaling and cluster analysis. We found that green consumer behaviour and a lower willingness to externalize costs do not always go together: one cluster of respondents (11%) scored high on green actions and low on WTE, but we also identified a green cluster with average WTE values (19%) and a cluster with low WTE values that was not green (6%). However, it is noteworthy that the group of respondents who scored the highest on WTE (14% of the sample) also rejected green behaviours particularly in the area of food consumption and waste. Gender was found to have a significant impact, with female students being more likely to engage in sustainable consumption behaviour and to reject externalising costs. Our results imply

that emphasizing the externalities generated by non-sustainable consumer choices may help to solidify the commitment of green consumers and also to encourage sustainable consumption among groups who are not currently green but are ethically sensitive to the consequences of their actions on others.

Promoting cycling in winter: Results from a survey experiment in Switzerland

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Cities worldwide seek innovative transportation options to reduce emissions (Bateman, 2022). Promoting cycling could prove particularly fruitful as it is a sustainable and healthy transport option (Galway et al., 2021). However, there is still debate in some European countries about whether it is worth expanding cycling infrastructure, especially for colder months and unpleasant weather (Wadewitz, 2022). The literature cannot yet provide much insight here, as only a few studies, mostly conducted in northern regions, examine cycling behavior specifically in winter (Amiri & Sadeghpour, 2015; Chapman & Larsson, 2021; Galway et al., 2021; Nahal & Mitra, 2018). To the authors' knowledge, no study from Central Europe has yet experimentally investigated winter cycling and its promotion.

The research aim is to investigate and compare the effectiveness of five different behavioral interventions to promote cycling in winter: (1) recording one's cycling time, (2) a monetary incentive, (3) social comparison, (4) an extra day off, and (5) a prize competition. This study also answers the question of whether and how the effectiveness of each intervention varies for different sociodemographic groups and consumers with different personal values.

The experimental study draws on sustainable consumer behavior literature, especially concerning cycling behavior in general, and facilitators and barriers to cycling in winter. The Theory of Planned Behavior (Ajzen, 1991) and Nudge Theory (Thaler & Sunstein, 2009) form the theoretical basis.

An online survey was conducted with participants recruited by the Swiss cycling association "Pro Velo". Pro Velo distributed the survey among approximately 50,000 participants of their "bike to work" initiative via an online newsletter. 11,038 Swiss bike riders completed it.

The survey included an experiment testing the effectiveness of the above-mentioned five different interventions. The average minutes per week participants in each experimental group would additionally cycle according to their self-assessment were measured.

All interventions lead to an increase in planned weekly winter cycling time in the experiment. The incentive to gain an extra day off by cycling more often leads to a 34% increase in intended cycling time. The challenge, where the best participants can win prizes and the measurement of one's own time increased weekly intended cycling time by 32%, and the monetary incentive by 31%. The social comparison condition also proves effective, but somewhat less so than the other incentives (28% increase).

Insights for different sociodemographic groups and according to personal values will also be shown. For example, there are clear differences in the effectiveness of each experimental condition for urban vs. rural residents.

Future research could test the effects in real-life experiments, e.g., by measuring actual cycling frequency during bike-to-work challenges with physical activity trackers.

In our conference contribution, we will present empirical results from the study, derive implications for policymakers, urban planners, companies, and individuals who want to contribute to the more frequent use of bicycles in winter, and suggest directions for future research.

A situated study of plant-based meal choices of urban citizens

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The transition towards a more circular urban food system depends on large-scale changes in citizen behavior with one of these changes being the transition to plant-based protein consumption. Whether individuals engage in pro-environmental behaviors like choosing plant-based protein is often explained based on interindividual variation such as differences in peoples' pro-environmental values, beliefs and norms. However, although many people state to highly value the environment, they often do not act according to their values. An assumption of why this value-behavior gap exists is that the influence of motivational factors on pro-environmental behavior is moderated by people's abilities and situational opportunities. Situational factors include both factors related to intraindividual variation such as individual's affective state as well as factors related to contextual variation such as physical and social factors. Indeed, prior studies found that meal choices are not a static phenomenon, but rather influenced by time-varying covariates that facilitate or hinder behaviors in the situation of choice. For example, Hoek et al. (2021) found in their literature review that food choices are significantly influenced by food outlets such as the availability of plant-based meals. Moreover, affective states like people's mood have an influence on people's general perception and behavioral motivation. Therefore, Onzwezen et al. (2021) also call for research on the effect of affective state on protein choice. However, the concrete impact of situational factors on repeated pro-environmental protein choices is not yet understood. Therefore, this study applied an ecological momentary assessment in November 2022 and collected data of urban citizens meal choices in varying affective states, physical and social contexts (N=90). First, participants were provided with a baseline survey measuring their pro-environmental values, social norms, self-regulation ability, and demographic variables. The second part entailed a three-week ecological momentary assessment (EMA) study. During this time period, participants received a prompt on their smartphones once a day at 14 out of 21 days. The assessments were conducted by using a data collection app. Participants were recruited in the wider Amsterdam Metropolitan region in cooperation with Flycatcher Internet Research. All participants gave written informed consent and were paid 10 Euros after successful participation in both the baseline and EMA survey. Using the data reported from participants daily, we conduct a series of regression analyses. As we follow participants during 10 to 14 days, we can explore time-constant between-person effects (values, self-control) and time varying within-person effects (mood) and situational effects (physical and social). Data analysis will advance our understanding of how stable trait-like values, personal abilities and varying situational factors interact in driving pro-environmental protein choices. Moreover, the results of this project will give practical recommendations about how to accelerate the protein transition.

Internalizing the environmental costs of food products: Effects on price-demand equilibria and environmental impacts

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The production of food products has significant externalities. Predominantly agricultural production, but also processing, packaging, distribution, and storage cause a vast array of different environmental impacts that threaten the climate, human health, and biodiversity alike. The costs caused by these impacts, as well as costs for damage abatement or restoration are not internalized in current market prices. This leads to a market distortion, as consumption and its costs are partially decoupled. In this work, we assess the effects of internalizing external costs into the market price by means of consumption taxes on (1) equilibrium prices, (2) associated changes in demand patterns, and (3) subsequent changes in environmental impacts. In detail, we evaluate LCA-based environmental impacts of 55 different food products or product categories using the AGRIBALYSE life cycle database and the ReCiPe impact assessment method. Applying different monetization methods (e.g., Environmental Prices Handbook), we determine the external costs of these products, and conceive different scenarios for how these costs could be incorporated into or represented in retail prices by regulatory policy measures (e.g., consumption taxes and subsidies) for the case of Germany. Lastly, the costs in the different scenarios are fed into CAPRI, an economic equilibrium model for agricultural trade, markets, and demand. Intermediate results show that already small price adjustments lead to new market equilibria with more sustainable demand patterns in Germany. For instance, the current results suggest that when internalizing IPCC-based climate change costs alone, changes in demand could lead to a reduction in greenhouse gas emissions from German consumption by 21 Mt CO₂ eq. When also considering additional externalities, such as eutrophication, toxicity, or particulate matter, this effect is amplified. However, as the CAPRI model allows for exports by default, the actual agricultural supply is not as strongly affected as the demand, hinting towards the risk of burden shifting to some degree. In addition, and especially in the current economic situation, there is also a limit to the extent of price adjustments that are socially acceptable and compatible – even in the policy scenarios where price increases of disproportionately harmful products are counterbalanced with subsidies for relatively more sustainable foodstuff. Despite the limitations, our study provides highly topical insights on the environmental potential of price internalization and the “polluter-pays principle”, and policymakers are presented with a set of different, realistic schemes for how existing, environmentally adverse market distortions could be amended politically.

E10: How can a meat consumption corridor advance the transition to just and sustainable diets?

Session Chair: Miriam Cué Rio

Room: B: Omnia, R: Momentum 1 (max. 30)

Dietary change towards healthier, more plant-based diets, is increasingly highlighted as a necessary mitigation option for keeping the food system within environmental limits. Yet, the OECD/FAO expect an estimated growth of 15% in global meat consumption by 2031, with European per-capita meat consumption projections — which currently exceed twice the global average — remaining virtually steady. While there is substantial scope for reducing meat consumption, current policies tend to focus on the production side (e.g. the restrictions on agricultural production imposed by the Farm to Fork Strategy), with very few examples of governments implementing measures to reduce meat consumption, other than information-based dietary guidelines.

This session will explore the relevance of using consumption corridors (CCs) to steer meat consumption towards sustainable levels. CCs stress the need for stronger governance on consumption, arguing that, to respect planetary and social boundaries, overconsumption needs to be limited and under-consumption needs to be addressed. The suggestion is to define upper and lower limits to consumption and to demarcate a consumption space in between, a corridor of sustainable consumption, where individuals are free to consume as they wish. The upper limits (i.e. the ceiling of the corridor) are needed to prevent the consumption of some individuals adversely impacting the ability of others to satisfy their needs. The lower limits (i.e. the floor of the corridor) are meant to guarantee access to sufficient resources for all. By setting limits to consumption, CCs challenge the ideology of consumer sovereignty, which is especially powerful in the case of food, as diets are often perceived as a matter of individual choice. Whether governments are justified in restricting such freedom through, for instance, taxation, tends to be a controversial issue. Controversy is also nurtured by the powerful agricultural lobbies, whose resistance to change towards sustainability objectives that might question the highly profitable industrial food and farming model, has been widely documented.

Participants will discuss on the basis of two papers: i) a paper introducing the idea of using CCs for the case of meat (Kanerva, 2022); and ii) a paper proposing a framework to define a meat CC in the European Union (Cué Rio et al., 2022). In addition to the conceptual discussion of these two papers, the session participants will focus on the specific challenges for the implementation of a meat consumption corridor. The goal is to close the gap between theory and practice by anticipating and reflecting on the scientific, societal and policy challenges that could arise from the implementation of a meat consumption corridor in the real world.

References

Cué Rio, M., Bovenkerk, B., Castella, J.-C., Fischer, D., Fuchs, R., Kanerva, M., Rounsevell, M. D. A., Salliou, N., Verger, E. O., & Röös, E. (2022). The elephant in the room is really a cow: using consumption corridors to define sustainable meat consumption in the European Union. *Sustainability Science*. <https://doi.org/10.1007/s11625-022-01235-7>

Kanerva, M. (2022). Consumption Corridors and the Case of Meat. *Journal of Consumer Policy*. <https://doi.org/10.1007/s10603-022-09524-5>

Line-up of speakers:

Welcome and Intro by Chair (Miriam Cué Rio)

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Introducing consumption corridors for the case of meat

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Presenter: Minna Kanerva, m.kanerva@uni-bremen.de (in person)

Problem statement: Consumption is increasingly seen as the root cause of the twin crises of climate and ecology, and so, addressing fundamental patterns and levels of carbon and natural resource-intensive consumption is seen as highly relevant. One of the emerging tools within strong sustainable consumption governance is the concept of consumption corridors. Employing consumption corridors is to bring about systemic change as well as absolute reductions in the negative impacts of consumption in a just manner and within participatory democracy.

Meanwhile, one of the many challenges societies currently face in terms of unsustainability is the system of industrial production and high-level consumption of meat that the industrial production enables. Scientists concerned with environmental sustainability and planetary boundaries largely agree that societies in high- and middle-income countries have to move away from their current meat consumption patterns, and that, globally, meat production and consumption must be made sustainable in order for us to have a chance of not exceeding the currently conceived carbon budgets and biodiversity targets, and not exceeding planetary boundaries beyond repair.

Aim: The aim of this presentation is to relate the enormous challenge of transforming the meat system to the concept of consumption corridors, to suggest some steps forward for bringing about meat consumption corridors, and to contemplate the more general significance of such a policy approach. The presentation is based on a recent paper introducing meat consumption corridors (Kanerva, 2022).

Approach and findings: The approach is conceptual, mainly using literature that fits under the umbrella of sustainability science, but also applying some of the results from discourse analysis contained in Kanerva (2021). The presentation will first link the planetary health diet (Willett et al., 2019) with sustainable meat consumption corridors. After this, two metaphors are suggested as discourse tools, whereby individual and societal transformation in meat consumption occurs as a journey along a continuum of different meatways. Such tools can support paradigm and system level change in meat. Subsequently, specific actions for bringing about meat consumption corridors will be suggested, and finally, the presentation will argue that applying consumption corridors in the meat context could serve as a bridge for increased societal acceptance of recomposed consumption more generally.

Conclusions and implications: This paper contributes to the theory of strong sustainable consumption governance and offers relevant tools for policymaking.

References:

Kanerva, M. (2021). The new meatways and sustainability: Discourses and social practices.

Bielefeld, Germany: transcript Verlag.

Kanerva, M. (2022). Consumption corridors and the case of meat. *Journal of Consumer Policy*.

<https://link.springer.com/article/10.1007/s10603-022-09524-5>

Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., Garnett, T., et al. (2019). Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet*, 393(10170): 447-492.

The elephant in the room is really a cow: using consumption corridors to define sustainable meat consumption in the European Union

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Implementing the European Green Deal requires a consistent food systems' policy that involves not only targeting the supply side but also conducting extensive changes in diets at the consumer level. Reducing meat consumption is an obvious strategy to put the European food system on track to meet the Green Deal's goals. This cannot be achieved by focusing solely on consumer choice and individual responsibility. Stronger governance is required to reduce the scale of meat consumption to sustainable levels. Such governance needs to be informed by a holistic definition of "sustainable meat consumption", designed to ensure that important sustainability priorities are not neglected, and to account for all emissions associated with EU consumption, regardless of where production takes place. This article presents a conceptual framework to define "sustainable meat consumption" based on the concept of consumption corridors (CCs). A CC is the space between a minimum (the floor) and maximum (the ceiling) consumption level, which allows everybody to satisfy their needs without compromising others' ability to meet their own. Embedded in a powerful set of principles (recognizing universal needs; tackling both over and under-consumption; framing food as a common good; promoting public participation; and addressing environmental justice and planetary sustainability), CCs are attuned to the Green Deal's ambition to "leave no one behind", in the EU and beyond. CCs provide a demand-side solution encompassing a more equitable alternative to discuss what is actually a "fair share" of the world's limited resources when it comes to meat consumption.

E11: Pathways for the sustainability transition of Ukraine's post-conflict food system

Session Chair: Maryna Strokai, Rico Ihle
Room: B: Omnia, R: Auditorium (max. 108)

Welcome and introduction (Vanya Simeonova, WUR)

Pitch presentations

Panelist I: Maksym Kononenko (Ambassador of Ukraine in The Netherlands)

Title of pitch presentation: Challenges and opportunities in the sustainability transition of Ukraine's food system

Panelist II: Mariia Pavlovska (National University of Life and Environmental Sciences of Ukraine and Research fellow at the National Antarctic Scientific Center)

Title of pitch presentation: Implications of the war for the sustainability of Ukraine's food system

Panelist III: Raimund Jehle (Regional Programme Leader FAO Europe regional office)

Title of pitch presentation: Global determinants and implications of the sustainability transition of Ukraine's food system

Panelist IV: Reinoud Nuijten (agricultural attaché of the Netherlands embassy in Ukraine)

Title of pitch presentation: The role of The Netherlands in the sustainability transition of Ukraine's food system

Panelist V: Oleksandr Zhuravel (expert in sustainable food production in Ukraine)

Title of pitch presentation: Opportunities of the sustainability transition of Ukraine's food system

Panelist VI: Kees Huizinga (large-scale Dutch farmer in Ukraine)

Title of pitch presentation: Challenges to the sustainability transition of Ukraine's food system from the primary production perspective

Panelist VII: Yurii Kovalskyi (chairman and director of Odesa Portside Plant, a chemical-industrial enterprise)

Title of pitch presentation: Which agri-food policies are needed to facilitate the sustainability transition of Ukraine's food system?

Panelist VIII: Sigrid Wertheim-Heck (WUR researcher in the project "ClimAgri4Ukraine" - Towards climate resilient smart agriculture and sustainable food systems in Ukraine)

Title of pitch presentation: Pathways of the sustainability transition of Ukraine's food system

Panel discussion with audience

Moderation: Maryna Strokai (WUR), Rico Ihle (WUR) (both researchers in the project "ClimAgri4Ukraine" - Towards climate resilient smart agriculture and sustainable food systems in Ukraine)

E12: Pathways to Action - Shaping a Collaborative Research and Action Agenda at the Interface of Sustainable Consumption and Sustainable Production

Session Chair: Jennifer Russell

Room: B: Atlas, R: Atlas 1 (max. 80)

Practitioners and researchers in the fields of sustainable consumption and sustainable production have developed deep expertise and strong, distinct communities of practice. The Value Retention Exchange Network-of-Networks [The VR(Ex)Change], is an emergent international network of industry, academic, and NGO collaborators with a goal of creating a community of practice that is focused on issues at the interface of sustainable consumption and sustainable production (SCP). This network-of-networks is funded by the United States National Science Foundation (NSF), with a goal of developing meaningful, productive, and action-oriented collaborations at the interface of SCP transitions. Through a facilitated, workshop-style session that consists of a series of interactive activities, participants will identify, refine, and co-create clear research and practice pathways and priorities for interdisciplinary and cross-industry collaboration. Creating connections and opportunities for early-career researchers (ECRs) is a key outcome priority for the workshop. Utilizing a backcasting-style workshop methodology, participants will be organized into interdisciplinary breakout groups and will be asked to collaboratively respond to a series of discussion questions and activities that include individual and group rankings. Workshop outputs will be collated and synthesized into a working document that will be shared with all participants and incorporated into The VR(Ex)Change's strategic growth and planning process. All participants will be invited to join The VR(Ex)Change and organizers will actively engage in facilitating new collaborative connections for participants with special attention devoted to early-career researchers (ECRs) who will be assigned leadership roles in the network's activities. Hosted by leadership team members from The VR(Ex)Change, this workshop session is open to everyone, and is focused on cultivating a strategic conversation that helps to build connections and convergence opportunities between practitioners and researchers interested in strategic collaboration across SCP initiatives and fields.

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Sahra Svensson-Hoglund, Virginia Polytechnic Institute and State University, svensson@vt.edu

E13: Sustainable Mobility

Session Chair: Antonia Graf

Room: B: Orion, R: B3032 (max. 52)

Designerly living labs for shaping and exploring sustainable mobility practices

Mia Hesselgren, KTH Royal Institute of Technology, Stockholm, Sweden, miahes@kth.se

Presenter: Mia Hesselgren, miahes@kth.se (in person)

Sustainability transitions of transport systems configured by multiple actors and technologies involve tackling wicked problems with high complexity and uncertainty. Design methods help deal with wicked problems and reconfigure alternative and more sustainable sociotechnical systems. Collaborative design methods support framing problem spaces and generating proposals for addressing these problems in a way that explores value from several perspectives. Furthermore, design tools are useful for anticipating future possibilities and, together with a design approach, they form structure to the fuzzy front end of innovating service systems. To support sustainability transformations of transport systems and, for example, design sustainable mobility service systems, there is a need to understand how such systems can shape sustainable mobility practices. To do so, designerly living labs can play an important role in developing sustainable mobility solutions and learning about the conditions for sustainable mobility practices to emerge and be sustained. Designerly living labs are design-driven living labs with interventions in everyday life that function as starting points for learning.

In a designerly living lab set up in a suburban area outside Stockholm, Sweden, prototypes of sustainable mobility services were designed and implemented on a digital platform. The service system was co-designed by stakeholders from the private and public sectors based on insights developed together with citizens in the area. It was made available to a selected group of citizens who became co-researchers in the designerly living lab. With the co-researchers living in the living lab, their sustainable mobility practices were shaped and explored. On the one hand, the co-researchers carried out this exploration with, for example, the support of research activities aimed at provoking reflections. On the other hand, focusing on everyday practices, the conditions for sustainable mobility practices were examined.

We argue that designerly living labs are useful for learning about sustainable mobility practices. Not only to learn how to shape sustainable mobility solutions but also to gain knowledge on how to address conditions for sustainable mobility practices to emerge and be sustained. Current transport systems urgently need to be transformed into more sustainable ones, and to support such transformations, new types of knowledge creation are required. Designerly living labs include new knowledge-creation methods and are valuable additions to the range of transdisciplinary research approaches needed for addressing wicked problems and sustainability issues.

The automotive industry in global production networks: implications for economic and environmental sustainability

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Transport and mobility emit a large share of global GHG. The urgency for sustainability makes that vehicle use, ownership and typologies must change. This directly affects the automotive industry. Still, it has political and economic power, causing a jobs-vs-environment dilemma. Exploring the current characteristics of the motor vehicles industry is the first step to understanding how its activity will be impacted by policy, new business models, possible supply disruptions, and the introduction of new vehicle types.

This paper aims to analyze the automobile industry, its sub-sectors, and its size and role in the national context in a multidimensional way. To do this, we explore the metabolic patterns of the motor vehicles industry of 8 European Union countries from 2005 to 2019. We quantify and study the nexus of the following variables: working time, value-added, GHG, electricity, and thermal energy. We provide a metabolic perspective from ecological economics, relating it to the literature on economic geography. This means that we do not only account for the inputs and outputs of production factors but also consider the functions and geographical distribution of the industries. According to these metabolic patterns, we can cluster the countries according to their functional specialization in manufacturing intermediate parts and modules, final assembly of vehicles, and management and engineering design. These roles are related to core-periphery dynamics in the European spatial division of labor.

The results show two critical aspects for economic analysis and sustainability, the metabolic patterns of auto industries are (i) different in the set of EU countries and (ii) beneficial within the economic structure but at the expense of the rest of the (mainly foreign) upstream sectors in the value chain.

Countries like Germany and Sweden have metabolic patterns coherent with their core function in the European automobile system. Both have a high value-added per hour of work and a large share of working time in the subsector Manufacture of motor vehicles. Germany is the center of the EU auto industry both in intensive and extensive terms: with the largest employment, vehicle production, and value-added per hour of work, and with some of the lowest emission intensities. Poland, Czechia, and Hungary are at the periphery. Their auto industries grew the most during the time interval of analysis. They are more specialized in producing parts and allocate less value added per hour of work. More specifically, Poland is on the opposite end of the core countries, with the lowest rates (greenhouse gas emissions per hour of work, energy per hour of work, and gross value added per hour of work) and the largest share of work allocated in the subsector Manufacture of parts. Labor-intensive tasks are located there due to their lower wages, which explains the low energy per hour of work. Other countries like Spain, Italy, and France play an intermediate role. They have more diverse metabolic patterns but have in common a relatively small percentage of employment in the total paid work in each country.

Defining sustainable consumption corridors for urban mobility: A theoretical and empirical contribution

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The article makes a theoretical and empirical contribution to sustainable mobility and sustainable consumption literature by applying the ideas of „safe and just space” and „sustainable consumption corridors” (Fuchs et al., 2021) to the mobility sector. Following previous publications on this topic (Dillman et al., 2021), we theoretically advance methods of setting consumption maxima and minima in two aspects: (1) estimating sector-based sustainable greenhouse gas (GHG) emission levels and (2) developing accessibility and transport poverty indicators informed by human need theories and capabilities approach (Mattioli, 2021; Vecchio & Martens, 2021). We present empirical results from two urban regions in Poland (the Poznań and the Tri-city agglomerations). We estimate GHG emissions from mobility (both local and long-distance) and calculate accessibility and travel poverty indicators based on GIS analyses and a representative travel survey with 4150 participants. We assess the performance of the regions and areas within them relative to the corridor and on a „social-ecological matrix” (GHG emissions vs accessibility/transport poverty). We identify the social and built environment characteristics conducive to the various positions relative to the corridor, such as socioeconomic status and the degree of car dependence. We then reflect on the political implications and procedural aspects of corridor-defining processes involving experts and the general public.

Bibliography

Fuchs, D., Sahakian, M., Gumbert, T., di Giulio, A., Maniates, M., Lorek, S., & Graf, A. (2021). Consumption Corridors: Living a Good Life within Sustainable Limits. Routledge.

<https://doi.org/10.4324/9780367748746>

Dillman, K. J., Czepkiewicz, M., Heinonen, J., & Davíðsdóttir, B. (2021). A safe and just space for urban mobility: A framework for sector-based sustainable consumption corridor development. *Global Sustainability*, 4. <https://doi.org/10.1017/sus.2021.28>

Mattioli, G. (2021). Transport poverty and car dependence: A European perspective. *Advances in Transport Policy and Planning*, 8, 101–133 <https://doi.org/10.1016/bs.atpp.2021.06.004>

Vecchio, G., & Martens, K. (2021). Accessibility and the Capabilities Approach: A review of the literature and proposal for conceptual advancements. *Transport Reviews*, 41(6), 833–854.

<https://doi.org/10.1080/01441647.2021.1931551>

Mobility democracy?! Analyzing the imaginary of inclusive transitions in urban mobility planning

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Policy debates on how to design just and inclusive transition processes from fossil fuels to more sustainable means of natural resource use have reached the urban planning sector. Lately, voices calling for energy democracy resonate more deeply in the scholarly and public debate, pleading for an inclusive, intersectional and diverse re-setting of infrastructures, technologies, processes, and discourses. As a result, paying attention to the diverse needs of various actors in the urban settings - particularly vulnerable groups - and the inclusion of these diverse needs in policy designs and processes seem to become more and more important for sustainable urban city planning. We follow up on these trends and elaborate on the question how energy democracy speaks to the governance of urban mobility planning. Heuristically we draw on the concept of imaginary from Science and Technology Studies (STS) to analyze what visions and expectation are emerging in mobility planning documents. With the help of a content analysis we empirically illustrate mobility democracy in urban mobility transition processes. Building on this, we discuss the suitability of the concept of energy democracy for the mobility sector and highlight its specific features.

E14: Co-Design and Social Learning in Sustainable Consumption and Production: Methodologies (1/2)

Session Chair: Jānis Brizga

Room: B: Omnia, R: Momentum 2 (max. 30)

Co-created pathways towards sustainable consumption – enabling inclusive and flexible transition strategies

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Problem: There is an urgent need to deviate from current unsustainable consumption, and on to alternative paths. Such transitions will require planning and decisions, in politics, business, and civil society. Such processes will face complexity, and if transition pathways are to be relevant, inclusive, and acknowledged different stakeholders need to be involved.

Aim: To develop and use a participatory process tool that can enable the formation of multiple pathways that include actions for enabling sustainable consumption, and that take uncertainty into account.

Theory: The importance of justice and recognition in sustainability transitions is increasingly called for and needs more attention. Without recognition and participation a risk is that neither research nor policy processes includes the relevant actors, questions and solutions. In this paper transitions to sustainable consumption are explored through co-created pathways.

Conditions that influence the possibilities to realize policy and action are constantly changing and the future is unpredictable. To support transitions to sustainable consumption, pathways including policy and action need to both perform well in a wide range of futures, and be able to adapt to unforeseen future conditions. Based on the above, the emphasis is here placed on understanding formation of adaptable pathways, and who's perspectives are visible and included.

Methods: The participative pathways tool developed in this project is based on Dynamic Adaptive Policy Pathways (DAPP). DAPP has mainly been used in water management and climate adaptation. For this context it has been developed and adjusted to suit the complexity of sustainable consumption. The approach enables co-creating and analysing policy pathways that can be altered along the path. The adapted tool was used in three workshops, focused on sustainable 1) vacationing, 2) eating, and 3) furnishing. Participants were civil society actors, businesses, and local, regional and national authorities in Sweden.

Findings: In the workshops the participants discussed possible actions and agency in relation to different future developments and changing conditions. The participants negotiated and agreed on an initial plan and adjusted their plan along a timeline from 2022 up to 2045. One result of the workshops was the actual plans that were constructed, these allowed for analyses of enablers/actions chosen and who was appointed responsibility. The main result was however the discussions, and different perspectives that were made visible.

Conclusions: Based on evaluation of the workshops, the tool can be used both to facilitate joint learning about planning for sustainable transitions, and to discuss agency when it comes to implementing measures. The tool has so far only been used in three workshops but should also be tested with a larger variety of stakeholder groups, considering aspects of power and agency. Implications: Tools for co-creating flexible pathways can be used both to understand and improve the conditions for achieving goals and visions even if the outside world changes. Working with flexible roadmaps requires participation and dialogue and can create processes to identify and analyze actors, enablers and contribute to learning processes.

Transitioning to Sustainable Food Systems: Enhancing and Restraining Factors in current Research using the Multi-Level Perspective

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The challenges the agri-food system is facing are interconnected and range from social issues over environmental impacts to economic tensions while influencing each other. Practices within the agri-food system have led to a loss of biodiversity, fuelling climate change or soil depletion. In turn, the continued pressure proves to be a boomerang, only stressing the food system even further, resulting in a self-reinforcing vicious cycle. A transformation of the food system is needed to tackle these intertwined challenges and enable food security and health of people and the planet for current and future generations. The multi-level perspective (MLP) on socio-technical transitions is increasingly used when analysing food system transformations. It has proven to be a useful framework to analyse societal transitions from a systemic perspective and to understand the factors influencing processes of change at different levels: niche, regime and landscape. However, an overview of common factors that are either conducive or impeding the food systems' change process, across different sectors and studies, is not given yet. This contribution examines the influencing factors that are enabling or disabling a transition towards sustainability in research using the MLP to analyse transitions of the food system. The information was gathered through a systemic literature search on scopus database from 2018 onwards, focussing on research articles applying MLP and a transition towards sustainability of the agri-food system. The results implicate that next to harmonisation of policies to create a conducive frame for the sustainability path, actors from all three levels seem to play a vital role. Participation of a wide range of actors promotes knowledge exchange and the formation of alliances. Leading actors should strive for common clearly defined goals and a shared vision of the path towards sustainability as an absent alignment can cause opposite effects. Networking activities lead to the realisation of collective goals. Governance and power relations need to be reconciled, involving marginalised actors and sectors. When it comes to decision making processes, a smaller independent group seems to work more efficiently than including all actors. It can be concluded that the transition process should involve multiple stakeholder groups and aim for an equitable participation.

Developing a relational approach to energy: A methodological guide

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In a recent call for the importance of social relations in shaping energy demand, authors documented increasing interest in a relational approach to energy (Hargreaves and Middlemiss, 2020). In this paper, we build on that starting point, on relational and economic sociology, and on our research project about the social relations of energy retrofit, to offer a methodological guide to such an approach. We detail the ontological and epistemological starting points of relational research, and highlight the ways in which methods can be deployed to capture the role of social relations in shaping decision-making on energy, as well as to offer innovative insights for policy-makers and practitioners. This includes articulating a conceptual framework for a relational approach to energy. A wide range of methods are useful and appropriate here, including qualitative methods aimed at understanding lay and expert experiences, quantitative approaches bringing together a range of secondary data sources, and participatory engagement and visioning processes with key stakeholders. Using our research project on energy retrofit as a case study, we reflect on the practical aspects of this research approach, and to offer pointers on methods choice for those interested in understanding the role of social relations in shaping energy decision-making.

Key contributions from this paper include:

- We show how relational theories and methods can help to explain the way people engage with energy decision-making in the context of the climate crisis.
- We specify and articulate a number of concepts (interactions, affiliations, relational work, social relations) which can help to elucidate a relational ontology for researchers.
- We offer some guiding questions which allow researchers to operationalise these ideas: questions that research projects can use to approach a range of energy interactions relationally.
- We finish by discussing the potential application of these ideas in future research and policy.

This is a novel and productive approach to studying energy practices, which has important implications for policy and governance of the energy/low-carbon transition.

Design objects as conversational tools enabling trust and engagement in sustainability transition projects within local governments.

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Co-creation methods have shown to be effective in building understanding of complex problems within urban sustainability, coping with uncertainty, and enabling development of creative sustainable strategies or interventions for specific local and urban contexts. In practice however, challenges remain, for example related to how to foster inclusion, trust and engagement in complex, long-term processes, and especially in highly unequal settings. Developing and implementing interventions and transitioning to more sustainable practices often requires larger scale projects with multi-stakeholder action, and strategies for longer-term collaboration and communication across sectors. In addition, in many cases this must be led or done from within established governance and urban planning systems, and may require lifestyle changes, stricter regulations, and new production practices. Such work does in turn depend on information and communication flows and channels that can enable trustful collaboration and citizen engagement over time. On one hand, local governments are required to provide clear information to the public, for example regarding sustainability impacts, the problems addressed, the interventions deployed, and the required changes in everyday practices. On the other hand, co-creation requires interaction, and that governments receive information from and engage in conversation and joint exploration with the public, for example regarding their needs and the strategies proposed and implemented. Citizen participation in sustainability transitions can take many forms, and this can also include co-production of knowledge with local grassroots movements tackling similar issues, supporting low-cost and effective implementation of transition projects and connection across initiatives. Through this paper, we explore design contributions to this long-term communication and how different types of design objects support fluid conversations around ongoing sustainability transitions projects, beyond single events. More specifically, what characteristics do such design objects and their use have that can enable trust, conscientious participation, and inhabitant engagement? A literature review is conducted to identify the state of art and knowledge on how different conversational tools, or “boundary objects”, have brought municipalities and inhabitants together for integrated urban sustainability transitions. The paper explores how visualization, prototypes, tactical interventions and other ways of materializing ideas support sustainability policymaking and implementation at the local level. The review further looks at how trust, information understanding, stakeholder engagement and establishment of shared sustainability knowledge can be supported through design. This analysis allows for identifying the existing needs for knowledge regarding how design contributes to effective transition strategies for urban sustainability and for identifying further research pathways and possible research experiments that can provide better design guidelines for such aims.

P: Friday, July 7, 12.45-14.00

P02: Poster Session 2

Social Learning for Transformations Towards Resilient Small-scale Agriculture: A Review

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The need for transformations towards resilient agriculture is imminent in the face of the climate crisis. Unfortunately, such transformations are occurring too slowly and the food system remains a huge contributor to climate change and is simultaneously extremely vulnerable to its effects. Furthermore, achieving resilience remains a complex task in itself as a system must be able to anticipate, prevent, cope with, and adapt to shocks and stressors. In response, the concept of social learning is increasingly being promoted as an effective mechanism for inspiring these much needed transformations, as learning and knowledge are deemed essential to building pathways towards resilience. We conducted a systematic literature review (SLR) to examine this connection between social learning and transformations towards resilience. The review aims to answer several research questions including what is the role of social learning in promoting transitions in small-scale resilient agriculture? And, to what extent is social learning a solution towards building resilience? The study aims to answer these questions by looking at the factors influencing social learning processes as well as their outcomes. In total, 39 articles were selected from Web of Science and coded and analyzed using atlas.ti. The study finds that there are many underlying positive assumptions about the role of social learning in transformations towards resilience, but there remains little insight as to how or why these learning processes lead to transformative actions. The study also finds that while almost all case studies lead to participant's changes in understanding about either climate-related issues or resilient agricultural practices, less than half of the studies noted the sustained adoption of transformative actions. Some of the key factors that influenced the adoption of factors included participatory on-farm demonstrations and addressing perceived risks from making on-farm changes. Based on this review, we propose a conceptual framework that outlines certain factors that are more likely to lead to adoption of transformative actions, taking into account differences in socio-economic contexts of smallholder farmers globally. Finally, with the results of the review, we aim to inform the direction of future studies that seek to investigate social learning as a solution to achieving resilience.

Sustainability, a clear pathway for society & industry?

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Everyone talks about it, everyone believes that they are fulfilling it. The talk is about sustainability, but why do many believe to be sustainable, although the lifestyles and life realities diverge so strongly in regard of sustainability? Sustainability is for many people something subjective, due to the fact that the term is not protected by name law, it is up to everyone to interpret sustainability in their own sense. However, the last 70 years have shown that humans are moving further and further away from sustainability. The sustainability sciences have long been aware that we need to change the "human Earth's system" in order to follow the principles of sustainability. But why is a clear and understandable definition of sustainability so important? Only through the framework of a qualitative definition human actions, supply chains, products and services can be aligned with sustainability. Decent development for all is not only a demand of the United Nations, it is a daily challenge for all of us. Due to the increasing inequality within society, as well as the crossing of planetary boundaries, the Earth system is getting more and more out of control. The climate crisis as well as various weather extreme events, which occur in a temporal interval, which does not let an adaptation become possible (as well as suggests that this frequency is caused by the human acting) are first harbingers of new Earth cycles, which will affect in the future the human life on earth considerably. We have arrived in the new Earth epoch of the Anthropocene, it is up to humans themselves to choose the amplitude of Earth change. Planetary Boundaries as well as the social indicators of the Sustainable Development Goals (SDGs) give us a first roadmap how sustainable development as well as sustainability can look like globally. The European Green Deal as well as the invention of first national supply chain laws can be interpreted as a step in the right direction, but is it enough to take steps at this pace if we already miss the 1.5° target in less than 7 years? The aim of this paper is to evaluate the past as well as the existing concepts of sustainability. Based on this, the concepts of Planetary Boundaries and Doughnut Economy will be used to derive a clear and comprehensive definition of sustainability that deliberately narrows the scope and thus allows for a development towards more sustainability. Humanity decides, whether we create the "Great Decoupling" or have completed the "Great Collapse" until the end of the century.

All following the same path? Comparing regime-incumbent firms' activities in the alternative protein transition

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Given existing sustainability challenges, and a lack of adequate responses, accelerating sustainability transitions is a key concern (Köhler et al. 2019). With its significant contribution to CO₂e emissions, the meat and dairy industry is an important industry to focus on. Sustainability transitions are typically analyzed based on the multi-level perspective (Geels 2004), which distinguishes between niches (where experimentation occurs), the regime (seen as dynamically stable, with established actor networks), and the landscape (which reflects macro-trends). Large regime-incumbent firms play a key role in sustainability transitions, given the market power and resources they possess (Köhler et al. 2019) with high expectations especially in scaling sustainable innovation beyond niches (Cramer 2020). Despite this, incumbent firms have traditionally not been in focus when describing regime actors in sustainability transitions, with the focus being rather on regulatory actors (e.g., Diaz, Darnhofer et. al 2013; Ghosh, Schot 2019). When incumbent firms are in focus, they are often characterized as largely just reactive to policy developments (e.g. Mori 2019). Furthermore, incumbent firms are usually viewed as one actor group (e.g., Geels et al. 2016), implying aligned interests and similar activities. Only few researchers (e.g., Berggren et al. 2015; Karltorp and Sandén 2012) have looked at and compared the different strategies between incumbent firms within the same sustainability transition. Given their influence on sustainability transitions, it is highly relevant to further expand our understanding of the different behaviors and activities of several incumbent firms of the same regime during a sustainability transition. Therefore, the research question this paper addresses is How do the activities of regime-incumbent firms differ within the alternative protein transition?

Using the alternative protein transition as a case study, this paper analyses the activities of the three largest consumer-facing food and beverage companies in Europe by revenue, Nestlé, Danone and Unilever (FoodDrinkEurope, 2022). Based on secondary data sources (including press announcements, sustainability reports, patent data) pulled from databases like factiva where a preliminary search yielded >900 results, an activity timeline since 2010 is developed. Through content analysis of the sources, different types of activities (e.g., M&A, introduction of new products or brands, patent filings) are identified. Based on this, the behaviors over time for each of the firms, as well as differences in behaviors between the firms are analyzed. Initial results show that there are indeed differences between the firms, for example with regards to the timing of their engagement.

This research contributes to the scientific debate around sustainability transitions in several ways. Firstly, it expands the view on one of the key actor types in sustainability transitions, highlighting the need for a more differentiated view on incumbent firms' actions in transitions. Secondly, it further adds to the understanding of the alternative protein transition, which has not yet been as thoroughly researched as other transitions (e.g., mobility, energy). In terms of practical contributions, this research can give indications on how to engage incumbents earlier during transitions, with the aim to accelerate scaling of sustainable innovations from niches.

References

Berggren, Christian; Magnusson, Thomas; Sushandoyo, Dedy (2015): Transition pathways revisited: Established firms as multi-level actors in the heavy vehicle industry. In *Research Policy* 44 (5), pp. 1017–1028. DOI: 10.1016/j.respol.2014.11.009.

- Cramer, Jacqueline M. (2020): Implementing the circular economy in the Amsterdam Metropolitan Area: The interplay between market actors mediated by transition brokers. In *Business Strategy and the Environment* 29 (6), pp. 2857–2870. DOI: 10.1002/bse.2548.
- Diaz, Marion; Darnhofer, Ika; Darrot, Catherine; Beuret, Jean-Eudes (2013): Green tides in Brittany: What can we learn about niche–regime interactions? In *Environmental Innovation and Societal Transitions* 8, pp. 62–75. DOI: 10.1016/j.eist.2013.04.002.
- FoodDrinkEurope. (February 28, 2022). Leading agri-food companies ranked by global agri-food sales in Europe in 2020/21* (in billion euros) [Graph]. In Statista. Retrieved January 11, 2023, from <https://www.statista.com/statistics/892704/ranking-of-europe-s-leading-food-companies-by-sales/>
- Geels, Frank W. (2004): From sectoral systems of innovation to socio-technical systems. In *Research Policy* 33 (6-7), pp. 897–920. DOI: 10.1016/j.respol.2004.01.015.
- Ghosh, Bipashyee; Schot, Johan (2019): Towards a novel regime change framework: Studying mobility transitions in public transport regimes in an Indian megacity. In *Energy Research & Social Science* 51, pp. 82–95. DOI: 10.1016/j.erss.2018.12.001.
- Karltorp, Kersti; Sandén, Björn A. (2012): Explaining regime destabilisation in the pulp and paper industry. In *Environmental Innovation and Societal Transitions* 2, pp. 66–81. DOI: 10.1016/j.eist.2011.12.001.
- Köhler, Jonathan; Geels, Frank W.; Kern, Florian; Markard, Jochen; Onsongo, Elsie; Wieczorek, Anna et al. (2019): An agenda for sustainability transitions research: State of the art and future directions. In *Environmental Innovation and Societal Transitions* 31, pp. 1–32. DOI: 10.1016/j.eist.2019.01.004.
- Mori, Akihisa (2019): Temporal dynamics of infrasystem transition: The case of electricity system transition in Japan. In *Technological Forecasting and Social Change* 145, pp. 186–194. DOI: 10.1016/j.techfore.2017.05.003.

Conveying Impact and Benefits of Recycled Sand

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This case study compares the use of uncontrolled quarried river sand versus post-consumer recycled sand near Johannesburg. Results show net damages and benefits considering development in South Africa, a biodiversity-rich nation. The purpose is to show how environmental net-damage and net-benefit can be measured and communicated to demonstrate the validity and value of moving towards sustainable consumption and production.

Uncontrolled quarrying gouges river banks, erodes soil, silts rivers, oil-pollutes water, disturbs aquatic habitat and downstream ecosystems and heavy vehicles crush vegetation. To produce re-usable fine sand uncontaminated building rubble comprising broken bricks and excavated soil is crushed on site. The functional unit is 60 years use building sand/m3 filler cradle to grave for e.g. bricks, concrete or asphalt.

Methods used include Life Cycle Impact Assessment (LCIA) of damage and loss and Life Cycle Benefit Assessment (LCBA) of benefit and gain. LCIA models loss of human health, ecosystems and resource accessibility due to pollution, climate change and land use change that deplete biodiversity, freshwater, minerals and fossil fuels. LCBA models security of human wellness, climate, ecosystems and resource supply, and land regeneration that repletes biodiversity, freshwater, mineral and fossil feedstock.

Results are tabled to show biodiversity, climate, human health and resource supply damages and benefits of use of post-consumer recycled (PCR) sand compared to avoided quarried sand to 100-year horizons.

PCR product has benefits and losses. Its most significant biodiversity and climate security benefits outweigh other losses avoidable by reliance on renewable fuels. Other urban space, social and safety benefits that arise are also described.

This case study of damages and benefits of PCR sand use was demonstrated using the LCBA alongside LCIA. Comparing damage versus benefit can reveal net-losses and net-gains. The work demonstrates measurement and messaging essential to move from unsustainable to regenerative and sustainable development. In doing so, it models the use of a scalable method that can be applied across all industries and materials.

F: Friday, July 7, 14.00-15.15

F01: Gender and Equity Perspectives on Sustainable Consumption

Session Chair: Henrike Rau

Room: B: Omnia, R: Auditorium (max. 108)

Gender differences in (un-)sustainable clothing consumption: Implications for fostering strong sustainable consumption

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A transition towards sustainable consumption is urgently needed. Measures to alter consumer behavior work best when being segment specific. Consumers are diverse and need to be addressed according to their unique needs and lifestyles. A common segmentation criterion is gender because men and women differ remarkably in consumption. Consequently, the promotion of sustainable consumption should be gender-specific, too.

Most studies that have investigated gender differences in sustainable consumption conclude that women consume more sustainably than men. These studies usually operationalize sustainable consumption as buying eco-friendly or fair-trade products, though. This operationalization corresponds to a weak approach to sustainable consumption. But it is now widely accepted that a strong approach is needed to induce the necessary change. However, research on sustainable consumption from this broader perspective with an explicit focus on gender is scarce. Therefore, not much yet is known on how to promote strong sustainable consumption in a way that is sensitive to men's and women's differing needs and behaviors.

One sector, which on the one hand is associated with severe socio-ecological issues and where, on the other hand, gender differences are particularly pronounced, is clothing consumption. A gender-sensitive approach is thus especially important in this field. But an encompassing overview of gender differences based on a strong perspective on sustainable clothing consumption is still missing. Against this backdrop, our study deals with the following research questions: (1) How do men and women differ in (un-)sustainable clothing consumption from a strong sustainable consumption perspective? (2) What are the implications for fostering sustainable consumption in this field?

To explore gender differences in (un-)sustainable clothing consumption we conducted a quantitative survey ascertaining participants' behaviors in various areas that can be identified as aspects of strong sustainable clothing consumption. The survey was distributed via social media throughout Germany. The final sample consisted of 3,236 people (46.2 % male, 53.8 % female) with ages from 14-82 (\bar{x} 38.2). Due to the ordinality of many items, we chose Bayesian Structural

Equation Modelling for data analysis. Besides modelling gender as explanatory variable for the various behaviors, we also controlled for age, income, and education as these variables often influence consumption patterns as well.

Our results show a rather diverse picture. Men and women differ in many but not all aspects of sustainable clothing consumption. In sum, women pay more attention to environmental friendliness and social compatibility while men tend to consume clothes more sufficiently. That is, from a strong sustainable consumption perspective the typical notion that women consume more sustainably than men does not hold in this generality – at least not in the area of clothing consumption. Rather, both seem to have different strengths and barriers here. The promotion of sustainable consumption must be cognizant of these differences to be effective. It should aim to further support men's and women's particular strengths but also strive to address their respective barriers to achieve improvements here. Some practical examples will be discussed in the presentation.

Operationalizing Equity in Climate Change Mitigation Scenarios

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Sustainable Development Goal 7 (SDG 7) recognizes the importance of extending access to electricity and other sources of modern energy to improve the infrastructure and technologies required to foster human development. It also aims to “ensure access to affordable, reliable, sustainable and modern energy for all by 2030”. However, in 2019, 800 million people had no access to electricity, whereas almost 2.6 billion people lacked access to clean fuels and technologies, most of them residing in the developing countries. This inequality is also apparent in the global cumulative emissions level of the countries of Global North and Global South. However, neglecting this stark disparity, several climate change mitigation scenarios and net-zero pathways (including the ones in IPCC AR 6) have prescribed a uniform reduction in the energy demand across countries. The lack of consideration of equity in the modelled scenarios is a serious research and policy gap currently which needs to be bridged. Building upon my ongoing PhD research, using quantitative methodology and statistical tools like R-studio, I aim to a) highlight the current gaps in energy and emissions across developed and developing countries b) to explore the possibilities of constructing global emissions pathways while foregrounding the principles of inter-regional equity while recognizing the constraints of a rapidly shrinking global carbon budget as well as the need for economic and human development in poor countries.

The analysis presented in the study indicates that the social and economic inequalities between countries are severe.. Achieving higher levels of human wellbeing is an essential goal that must be considered alongside the imperatives of climate action. It is also necessary to understand that developmental aspirations of the Global South go beyond just the more immediate and basic minimum targets of poverty eradication. Accounting for this, while constructing global mitigation scenarios is essential.

Since, developed countries have already exhausted their fair share of carbon budget, it becomes necessary that they implement immediate and deep mitigation measures while providing for the transfer of finance and technology to the rest of the world. Improvements in energy and emissions intensity can also lower the growth of emissions. However, this would depend upon several factors, from fuel substitution to technological progress, and structural changes in the economy. For developing and least developed countries, this would come as an additional financial constraint, which can impact their already limited capability to build essential infrastructure. Any proposal for climate change mitigation must therefore begin by an explicit consideration of developmental gaps between the countries and the constraints national circumstances pose to effective global climate action. The equity based pathways discussed in this study can be a useful starting point for including considerations of equity while constructing model-based futures.

Caring for the environment and people: studying their entanglement from a societal metabolism and intersectional perspective through family time-use budgets.

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Hegemonic economic models make the value of unpaid care work and environmental services invisible. However, the contribution of these services is vital for the well-being and survival of societies: humans are both inter and eco-dependent. Environment and care could be considered societal common goods, as they are mostly not subject to commodification. Both ecological and feminist economics have analyzed the pros and cons of commodifying their value, accumulating good arguments for avoiding it, and developing alternative ways to show the relevance of their contribution to the economy.

Time-use patterns have been used for visualizing unpaid care work, intersectional privileges and oppressions, and the way in which societies metabolize environmental throughputs. In this paper, we explore how provision and requirement of care are linked to biophysical throughputs associated with social practices, socio-demographic aspects, the provision of services from outside the households, and the overall metabolic pattern of society. These interrelations are explored using the End-use Matrix (EUM), a key tool of the Multi-scale Integrated Assessment of Societal and Ecosystem Metabolism (MuSIASEM). In this paper, the EUM is adapted for the study of household metabolism through a family time-use budget. Using benchmarks of previous studies on the metabolism of societies and their bioeconomic pressure, we show the potentialities of MuSIASEM to characterize the complex set of relations that interrelate care and environmental pressures in biophysical terms. Socio-demographic characteristics such as age are used to define different requirements of care within the households (e.g., babies require 24 hours of nurture and care), while labor and welfare state regimes are associated with care provisioning and throughput pressures. The characteristics of the metabolic pattern define further contingencies. For example, higher metabolic rates in primary and secondary sectors (both associated with higher environmental pressure) allow higher proportions of paid care services and less time-use pressure over family budgets. In contrast, high dependency rates and long working days operate in the opposite way. Family, community and public assistance supporting care work are crucial issues modulating the structural drivers described previously and the quality of care.

In conclusion, we show that the basic questions of economics (provision, requirement and distribution) could be handled in relation to care and environmental throughputs without monetary indicators. The proposed toolkit identifies crucial synergies and trade-offs between care and environmental issues and how intersectionality aspects such as age, race, class or gender overlap with these entanglements. The conclusions also show that understanding and contextualizing these interrelations provides valuable insights on how to concretize radical imaginaries of change towards post-growth economies concerned with planetary boundaries and societal well-being.

About the Paradox of Sustainable Production and What We Can Do About It!

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Sustainability is playing an increasingly important role. Not least due to the definition of the sustainable development goals (SDGs) in the framework of the agenda 2030 by the United Nations (UN) in 2015 (United Nations, n.d.), it has become clear that the cooperation of different actors is needed to achieve the defined 17 goals. Industry, as a global actor, has a special role to play in this. In the course of sustainable production processes and chains, the industry is confronted with the responsibility of reflecting on the consequences of its own trade on an ecological, economic, and also social level and deriving measures that, according to the definition of sustainability (Hauff, 1987), will also enable future generations to satisfy their needs. While the ecological pillar of sustainability is already being addressed by different industrial initiatives (Deloitte, 2021), it is questionable to what extent the economic and, above all, the social pillars of sustainability also play a decisive role. Accordingly, it is questionable to what extent sustainability in its triad of social, ecological, and economic aspects is taken into account holistically at all, and thus to what extent the industry contributes to achieving the 17 goals defined by the UN.

This paper presents a qualitative study that explores these questions. Interviewing 31 representatives from the manufacturing industry in Germany, results indicate a Paradox of Sustainable Production expressed by a theoretical reflection of the need for focusing on people in production processes on the one hand and a lack of addressing the social pillar of sustainability in concepts on the other hand. However, while it is a troublesome finding given the striking need for sustainable development (The-Sustainable-Development-Goals-Report-2022; Kropp 2019; von Hauff 2021; Roy and Singh 2017), the paradox directly lays out a path of resolving it. This is because, given its nature, we can see that we could resolve it via the implementation of strong educational efforts trying to help the respective people of the manufacturing industry to understand the holistic and interdependent character of sustainable development (The-Sustainable-Development-Goals-Report-2022).

References

Deloitte (2021). Nachhaltigkeit in der Fertigungsindustrie.

<https://www2.deloitte.com/de/de/pages/energy-and-resources/articles/nachhaltigkeit-in-der-fertigungsindustrie.html>.

Hauff, Volker (1987). Unsere gemeinsame Zukunft. Der Brundtland-Bericht der Weltkommission für Umwelt und Entwicklung. Greven: Eggenkamp.

Kropp, Ariane (2019). Grundlagen der Nachhaltigen Entwicklung. Handlungsmöglichkeiten und Strategien zur Umsetzung. Wiesbaden, Springer Gabler.

Michael von Hauff (2021). Nachhaltige Entwicklung. In: Michael von Hauff (Ed.). Nachhaltige Entwicklung. Grundlagen und Umsetzung. 3rd ed. Berlin/Boston, De Gruyter Oldenbourg.

Roy, Vivek/Singh, Shubham (2017). Mapping the business focus in sustainable production and consumption literature: Review and research framework. *Journal of Cleaner Production* 150, 224–236.

The-Sustainable-Development-Goals-Report-2022. <https://unstats.un.org/sdgs/report/2022/The-Sustainable-Development-Goals-Report-2022.pdf>.

United Nations. THE 17 GOALS | Sustainable Development. <https://sdgs.un.org/goals>.

F02: Transforming Agricultural Production Systems

Session Chair: Verina Ingram

Room: B: Omnia, R: Quantum 1 (max. 30)

Silvopastoralism as a circular food system for milk and meat in the tropical region of Latin America

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Most meat and dairy systems in the tropical region of Latin America are characterized by little consideration to reduce resource consumption and emissions to the environment by closing the loop of materials and substances. We evaluate here the state of progress on understanding silvopastoralism (SSP) as a circular food system for milk and meat and its potential contribution to food security, sustainability and reduce environmental impact. For this we review published information from a sample of SSP studies conducted in Colombia, Mexico and Peru. The main characteristic of SSP from the standpoint of circularity, is the capacity for using local forage resources and native trees and shrubs (e.g., established by natural regeneration) for different agricultural and non-agricultural purposes (used as live fences, fodder, shade, timber, fruits, medicinal products). Additionally, SSP has proven capacities to use land efficiently, decrease the environmental impact of livestock with reduction of enteric methane, nitrous oxide emissions, and increase carbon sequestration (in soil and tree biomass), and animal welfare in comparison with monoculture grazing systems. This includes direct strategies with the use of local byproducts like oils or plants containing secondary metabolites to mitigate enteric methane emissions, or indirect interventions such as carbon sequestration by the native trees-shrubs and the management of grass and crops to increase soil health (key for the sustainability of livestock systems). Due to the increase of protein banks (use of different legume species with potential for biological N₂ fixation) and more efficient nutrient cycling, which, with a rotational crop management, silvopastoral systems have the potential, at farm level, to increase the efficient use of N and P, and to reduce the level of nitrous oxide emissions. Trials conducted in Mexico, Colombia and Peru suggest similarities in the general circularity characteristics of SSP. However, the evidence-base of tested methodologies and system designs for silvopastoralism do not exist at the same level of advance in different locations of Latin America, a situation that may be explained by different geographical and climate conditions, but also due to different economic and policy factors that need to be defined. As most producers in the tropics of Latin America are of the mixed crop-livestock farming type it is needed to exploit the potential of a (re-)combination of crop and silvopastoral farming under the concept of circularity with a thorough understanding of the system. Evaluations like MCI (Material Circulator Indicator) need to be conducted on different silvopastoral options to measure their degree of circularity for understanding processes and improving them. A good example is to compare their potential to regenerate agricultural land as many SSP have developed on degraded soil. Furthermore, widespread adoption of silvopastoral practices remains limited, raising questions about the achievable scale up which apparently need to ensure that farmers have access to inputs, capital

and information as well as also consider cultural and behavioral components affecting adoption. For this reason, the exchange of experiences is a key element to progress towards developing robust SSP as a circular food system.

Concepts to Understand and Research Transformative Change for Biodiversity & Equity (TC4BE)

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The complexity of agro-food systems which characterised by globalisation processes, large geographical scales, opaque value chains, flows of resources, power and values in contexts of highly inequitable power relations which displace decision making far from communities and nation states where food systems originate and externalise negative socio-environmental impacts, with global calls to action on food security/environmental public goods suggests that deep, systemic changes are necessary with alternative transformation pathways which push back on globalised narratives of scarcity and crisis and which involve more autonomous and regenerative trajectories. Thus concepts embrace production to consumption, finance and investment, governance arrangements and power relations. However, understanding and consensus on how to achieve agro-food system transformations is lacking. Given this concept, the new EU H2020 funded Transformative Change For Biodiversity & Equity (TC4BE) project aims to generate evidence and tools to advance understanding on how to achieve transformative change in agro-food system to enhance biodiversity and equity outcomes and strengthen stakeholder transformative change capacity. TC4BE targets telecoupled agrofood systems which drive land use change and create negative biodiversity and equity impacts, including in biodiversity-rich production locations in the Global South. In this paper we propose using socio-ecological / socio-technical systems as a lens to understand agrofood systems using telecoupling and relational theory, This critical interrogation will be conducted from different perspectives (disciplines, global north and south, indigenous....). As with critiques of globalisation theory, we will reflect on the ontology of societal and environmental change that underpins transformative change and which alternatives exist. Relationality theory calls for co-production of situated knowledge and recognizing different world views and relational values – but there are tensions (how to engage in an equitable, transdisciplinary way, without imposing categories; how to produce situated knowledges drawing on/generating plural forms of knowledge – while recognizing the nesting of living socio-natural systems, hegemonies (over ideas, land uses, purpose of economic exchange etc) and the role of distance / connection to place. This conceptualisation aims to pave the way for empirical work on leverage points for sustainable transformative change pathways, expanding the boundaries of current thinking about future agrofood systems, especially those with far-reaching values and economic rules shifts.

Platform-based sustainability governance in Indonesian aquaculture

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The aquaculture industry faces several sustainability challenges related to the unsustainable use of inputs such as feeds and antibiotics and the resulting pollution and destruction of sensitive ecosystems. Addressing these challenges is especially difficult in information-poor and fragmented value chains dominated by smallholder production. An increasing number of digital platforms seek to improve the sustainability of aquaculture through the collection, analysis and communication of digital data. Digital platforms provide automated farm management (advice) and digital marketplaces to source inputs such as feeds and to sell 'data-intensive' aquaculture products. Data is generated using a variety of sources such as sensors or input by producers. The informational processes introduced by digital platforms enable new ways of steering towards sustainability. In doing so, digital platforms appear to reorganize aquaculture value chains, changing the roles of producers in managing their farms and the role of traditional aquaculture processing firms in coordinating their supply chains. To reflect on these changing dynamics in aquaculture value chains we perform a case study of the Indonesian start-up eFishery, a digital platform application for the Indonesian aquaculture sector enabling producers to source inputs and sell their products. eFishery is used by thousands of smallholder shrimp and tilapia farmers in Indonesia. The platform is based on an automated feeding machine placed in ponds and equipped with sensors to collect data about the use of feed and water quality. The data collected is used to optimize feeding, whilst the digital app also allows producers to purchase feed, sell their products and get access to finance based on analyses of production data. We conducted interviews with various users of the platform in Java, including producers, traders, processors and input suppliers to reflect on the ways in which the use of the platform changes relations and dependencies in the aquaculture value chain. Based on our findings, we analyse the implications of the platformization of Indonesian aquaculture for the sustainability governance of the sector.

F03: Circular Business Models

Session Chair: Pavel Růžička

Room: B: Omnia, R: Quantum 4 (max. 30)

Local models of circular economy in the Mekong Delta in Vietnam

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SUMMARY: Rural areas in the Mekong Delta in Vietnam do not have access to modern infrastructure, but they have plenty of biomass and sunshine. In our project we generated agro-industrial systems that generate a circular economy in small village.

The paper describes the approach and some results.

BACKGROUND: In the Mekong Delta in the South of Vietnam, there are numerous villages specializing in specific crafts or agricultural products. In such "craft villages" many of the local families practice the same craft. A typical village will produce either grass mats or rice starch, flowers, fish, seafood or coconut products, etc.

Infrastructure in the Mekong Delta is poorly developed. The roads and bridges are often only suitable for single lane vehicles, the water supply is not comprehensive. There are hardly any sewage systems, and the power supply is often based on small diesel generators serving a village or single families only. While there is both abundant biomass and water, the latter is mostly heavily polluted and / or brackish.

The solution for this environmental and societal problem is called Agro-Industrial Zero Emissions Systems – AIZES.

This structural prerequisite provides a good basis for the establishment of a local emission-free circular economy driven by renewable energies. For this purpose, a system must be designed that includes water, energy, recyclable materials (fertilizer) and food and interlinks them in cycles. A prerequisite for simple modelling and practicable implementation is the structuring of the systems into functional units that reiterate and can be quantified.

Input/output relations are known for these modules and are connected in the model by material and energy flows. Investment and operating cost as well as the respective energy demands for each unit are established.

In the modelling individual units are linked from a systems point of view, which is used to calculate energy, material and monetary flows.

PROJECT RESULTS: On-site implementations, which were carried out based on the simulation results, show promising results. On the one hand, the environmental pollution caused by wastewater and liquid manure decreased, on the other hand, the use of fossil fuels could be reduced.

Regarding families' economics too, the projects were very successful. The measures paid for themselves in a short time and led to an improvement in household budgets. From a macro-economic point of view, in addition to the savings in fossil fuels, it should be noted that the quality of life for the participating families in the craft villages has increased, which is seen as a measure against rural exodus.

Circular Business Model Innovation from a Controlling Perspective

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Traditional “take-make-use-dispose” systems have become a threat for a sustainable development, with manifold reasons and negative consequences, just to mention the scarcity of resources and environmental pollution amongst many others. The circular economy (CE) concept offers solutions to these problems, and circular business models (CBM) play an essential role in realizing and spreading the circular economy and transforming industry. On the one hand, new CE technologies require a suitable business model in order to establish themselves on the market; on the other hand, new types of business logic (such as data-driven business models or in the sharing economy) create numerous opportunities. The question that arises is how and with which methods and instruments the potential of CBMs can be recognized in order to be able to assert itself alongside established business models. This requires suitable procedures for decision support and control of circular business model innovation (CBMI).

Based on a comprehensive literature review and expert interviews, a following survey of established industrial companies conducted as part of a dissertation project shows that significantly more business model innovations in the area of circular economy are implemented through the use of standardized procedures. A high level of digitization in the company also plays a key role in developing new activities in the circular economy.

Within the framework of a case study, a concept was developed for the support and management of CBMI by controlling. The aim is to establish business model innovation controlling as a contribution to the successful implementation of CBMI in established companies in order to improve both the effectiveness and the efficiency in the procedure: Ultimately, the aim is to develop business models for the circular economy with a higher probability of success due to customer and market proximity, lower risk, shorter time-to-market and long-term value potential - for companies, the environment and society.

In this context, controlling is understood as a special bundle of management functions directed toward the present and the future, which enables the innovative further development and optimization of corporate goals by supporting steering, planning, specification, decision-making and control tasks. Based on an end-to-end process for business model innovation, relevant activities and decision-making situations are identified in a first step. In the next step, the function of controlling in this process is considered on the basis of selected instruments and methods. Specific aspects of the circular economy are integrated into the controlling instruments. Approaches to the penetration of controlling with digitalization are presented. New business logics (such as data-driven BM), which are made possible by digitization, require the adaptation of the controlling instruments and the controlling tasks. Controlling in combination with consistent knowledge management can help to develop, plan, implement and establish new business models for the circular economy on a better informed decision basis.

Circular Business Models as means towards more sustainable consumption behavior? - An exploratory empirical investigation with circular business in a developing country context

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Problem statement: Circular business models (CBMs) are gaining relevance as means to tackle current problems arising from often unsustainable production and consumption systems. However, research on CBMs often focus solely on the former trying to improve resource efficiency, among others, while their role in providing opportunities to promote changes in consumer behavior remains under-researched.

Research questions/aim: The objective of the article is to explore how CBMs can influence consumer behavior. More precisely, we are interested in understanding which factors need to be modified in CBMs to promote sustainable consumer behavior.

Theoretical approach: To research and identify the capabilities (C), opportunities (O) and underlying motivations (M) that give way to more sustainable consumption behaviors (B), we draw on a widely used behavior change model: COM-B model. By doing so, we unearth important factors either inhibiting or fostering more sustainable consumer behavior.

Methods: We conducted exploratory semi-structured in-depth interviews (n=8) with key personnel from innovative business. All interviewees were conducted between August and October 2022 with senior managers it funders in businesses with circular economy ambitions in Brazil as a developing economy context that, again, remains under researched. All interviews were transcribed and investigated following thematic analysis.

Findings: The results demonstrate that strategic decisions taken by the managers of circular businesses are often influenced by their own experiences, motivating their own behavior and their ambition to foster consumers' circular practices. That is, greater socio-environmental awareness shows to ignite an active pursuit to gradually change their customers' lifestyle. Thus, managers align their business to the ethical and moral values that they believe are most important. Further, transparency in adopting the practices of these businesses generates trust, belonging and respect from both employees and consumers. This, in turn, can result in improved customer loyalty and partnership networks.

Lastly, findings show that consumers are more accepting of the idea of consuming in different ways when they experience businesses as supportive enabling actors.

Conclusion & Implications: Our findings demonstrate that CBMs can provide opportunities to consumers to both consume more sustainably and enhance people's well-being to those involved. However, managers face significant challenges in consolidating CBMs. This is perhaps even more so in Brazil since the country lacks public policy incentives that encourage the strengthening of CBMs and business practices.

Towards a more circular nutrient economy: the potential of reused nutrients to cover crop needs at the regional level in Belgium

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Re-introducing secondary nutrient resources, such as manure and human excreta, into the food system can partially replace synthetic fertilizers and enhance food system circularity and food security. These secondary resources are often underutilized, either because their use is prohibited and discouraged by laws, norms, and the lack of infrastructure for appropriate treatment, or because they are not generated close to the sites where they are needed. In regions with intense livestock production, like Belgium, there may be an oversupply of manure, further discouraging the reuse of human excreta. Nonetheless, cities continue to exist and to produce nutrient rich effluents.

In this study we assessed crop needs for nitrogen (N), phosphorus (P), and potassium (K) in Belgium, and compared them with the availability of nutrients from manure and human excreta. We further We found that the supply of all nutrients from manure in the North of the country by far surpasses crop needs for N, P, and K, whereas in the South supply smaller than the demand for N and P. Despite the abundance of manure, especially in the North, human excreta makes up for 19% of the N and 9.7% of P available in secondary nutrient sources. Utilizing human-derived nutrient sources closer to the cities, and distributing manure across the whole country more evenly, could smooth out the differences in the supply and need for nutrients, and allow of a better utilization of the renewable, local available secondary nutrient sources, increasing the food system circularity. To showcase this potential, we developed a scenario where nutrients generated in Brussels Capital Region are used to cover crop needs in the two neighboring Brabant provinces, creating a more circular peri-urban food system.

Our results inform the discussion on the reuse of secondary nutrient sources, by considering not only their availability, but also the demand for them, their spatial and temporal distribution, and the legal, logistical, and technological barriers that inhibit the transition to more circular nutrient management.

Adoption of Circular Economy Practices in the Calgary Furniture and Allied Products Manufacturing Sector: An Analysis of the Drivers and Challenges

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Although the concept of circular economy and adoption of circular economy practices are on a high trajectory globally, some jurisdictions and economic sectors are yet to know or fully grasp the understanding of what circular economy is and what is involved. Widespread awareness and knowledge of circular economy concept and its associated practices is essential to adoption and achieving the waste reduction benefits of adopting circular economy practices both locally and on a global scale. In view of the characteristic large amount of resource consumption and waste generation in the furniture industry, this study examined the extent of circular economy practices' adoption in Calgary's furniture and allied products manufacturing sector. The goals of the study were to determine motivations for the adopted circular economy practices, and challenges that have to be overcome to achieve the proliferation of circular economic practices in Calgary's furniture and allied product manufacturing sector. The study approach consists of site observations, the development and administration of questionnaires, and interviews with top management of the participating companies. Data analysis involved the use of simple descriptive statistics and extraction of linguistic terms. The study showed that product dematerialization and waste recycling are the circular economy practices adopted by majority of the participants. Economic benefit was the main motivation for the adopted circular economy practices. More supportive regulations and governmental incentives would be needed to encourage majority of them to adopt other circular economy practices. These results provide circular economy promoters and policy makers with insights on what could be done to foster adoption of circular economy in the furniture and allied industry. Taking these steps would enable us to reap the dividends of developing and utilizing circular system approaches in our economic endeavors. Improvement in circular economy practices' adoption in the furniture industry would foster sustainable production and consumption and lead to an overall improvement of public health and ecosystem wellbeing.

F04: Sharing Economy: Consumer Perspectives

Session Chair: Matthias Lehner

Room: B: Omnia, R: Quantum 2 (max. 30)

Making circularity at home: Consumers' valuation work and efforts to promote the recirculation of clothes

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Presenter: Christian Fuentes (in person)

The circular economy has attracted considerable attention from scholars, governmental agencies, NGOs and companies (Hobson, 2016; Schulz, Hjaltadóttir, & Hild, 2019). The CE program sets out to break the take-make-dispose linear economy in which materials flow in one direction and in its place establish a circular system in which materials are kept in circulation through systemic “closed” loops of production and consumption (Hobson, 2016; Mylan, Holmes, & Paddock, 2016). While consumers are often framed as crucial for the circular economy, relatively few studies have in the past delved into the question of how circularity is performed by consumers or the role of the domestic sphere in making circularity possible (Mylan et al., 2016). This is now starting to change and we have in the last years seen a number of sociological or sociologically inspired consumption studies that take the social-cultural and socio-material aspects of circular consumption seriously. These studies have drawn attention to the complexity of household consumption and put emphasis on the multiple social relations, socio-technical entanglements, social norms and consumption work involved in effort to consume in more circular ways in the context of everyday life (Hobson, Holmes, Welch, Wheeler, & Wieser, 2021; Mylan et al., 2016; Sutcliffe, 2022).

In this paper, our aim is to contribute to this emerging field of sociologically inclined research on circular consumption by exploring and conceptualizing how and under what conditions consumption objects loose or gain value as a result of what we call mundane valuation. Drawing on the sociology of valuation (Muniesa, 2012), we direct our attention to the social and material process by which values are assessed, negotiated, contested, established and maintained (Doganova et al., 2014). We ask: How and why do consumption objects become (de)valorized in everyday practices? What devices and resources are involved in consumers' (de)valorization of consumption objects? And importantly, under what conditions can these processes and practices be changed to enable circularity?

These questions are here explored in the context of clothing consumption. Our analysis builds on ethnographic interviews with and digital monitoring of 33 Swedish households recruited for a field trial where consumers were asked to try out one of three circular fashion platforms; one focused on repairing, one on reselling and one on renting clothes.

The preliminary analysis shows that both successful and “broken” paths of recirculation are the result of consumers' valuation work. While certain arrangements of practices, devices and registers of valuing create favorable conditions for recirculation, there are many other examples of “broken” trajectories in which goods become devalorized and thus not deemed worthy of recirculation. There are also situations in which the available resources needed for recirculation are not in place.

Thus, our study suggests that the possibilities for everyday circularity are shaped by broader social norms, domestic infrastructures, economic structures, and dominant forms of meaning connected to clothing and their use. Efforts to promote circular consumption, like those performed by the circular fashion platforms studied here, have to consider, work with and/or work to reconfigure these established socio-material structures.

Making and breaking links: the transformative potential of shared mobility from a practice theories perspective

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This paper studies the transformative potential of the Sharing Economy in the field of mobility. Shared mobility has the potential to contribute to the transition to a more sustainable mobility system. However, the environmental impacts and the extent of proliferation of the various shared mobility practices differ considerably. It is problematic that the most widespread practice—free-floating carsharing—shows the least environmental potential. The other shared mobility practices studied in this paper – peer-to-peer carsharing and cargo bike-sharing – are more promising from an environmental perspective, but they are rather niche phenomena. Thus, the question arises as to why some shared mobility practices proliferate more readily than others. This paper studies this question from a practice theoretical perspective, focusing on how practices link or do not link with one another. It analyses how various shared mobility practices, as well as the practice of private car travel, connect to other practices via spatial-material and temporal links. The analysis explains why private car travel and, to a lesser degree, free-floating carsharing integrate relatively easily into everyday life, while other forms of shared mobility struggle to do so. In many cases, the space for integration of environmentally more promising shared mobility practices is limited because private car use and ownership connects with so many other tightly interconnected practice complexes. For example, the abundant provision of parking sites at working places, shopping facilities or homes upholds the tight connections of the practice of car travel and the practices of working, shopping or housing. Interfering in these unsustainable constellations by making links, but more importantly by breaking them, will be necessary for shared mobility to have any significant positive environmental impacts. Pull measures such as financial support for or promotion of sharing schemes are examples of making links between practices. Changing car-centred infrastructures or car-friendly law, instead, are examples of breaking not sustainable links between practices. Breaking links changes the starting conditions and checks the advantages of unsustainable mobility practices. While the making of links—supporting shared mobility practices in integrating in everyday life—is a common strategy in research and in politics, the breaking of links is often neglected; there is literature on diffusing, spreading, upscaling and mainstreaming sustainable mobility practices and innovations, but little on how this is related to the ex-novation of the currently dominant system of automobility. Clearly, the making of links is politically more comfortable and aligns with neoliberal positions—but the focus on that strategy hinders a more effective transformation of the mobility system. At least in the field of mobility, ex-novation might be the central ingredient for successful innovations, is a central argument of this paper. This paper scrutinizes the research topic in an anticipatory and theory-based manner and offers suggestions on how shared mobility could unfold its environmental potential.

Measuring the readiness to share: Scale development and initial validation

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This study analyzes how users differ in their sharing attitude by developing a scale to measure the “readiness to share”. Sharing can be a way to shift from linear towards more circular and sufficient forms of consumption through cooperation (Schor 2016). It increases the use of physical goods by allowing multiple people to access them. This can happen through different modes of exchange: renting, lending, and swapping are only a few examples. Due to resource scarcity, consumer preferences, and technological progress, the number of business models enabling the utilization of idle goods multiplied rapidly in the last decade.

Available sharing options range from grassroots initiatives preventing food waste to rental platforms, which allow individuals to monetize their idle tools. This variety of sharing options increases the difficulty of generalizing findings. Peer-to-peer platforms enable users to share their goods. This adds another dimension of engagement and another level of complexity: not only demand but also supply depends on users. Many platforms struggle to become viable because they lack users who provide goods.

Previous studies identified various relevant drivers for user engagement in individual cases. For example, moral motives affect sharing intentions differently, depending on the context. Norms and trust can also influence sharing intentions.

In this study, we developed a scale to measure the “readiness to share” as a general attitude of users and providers of goods. The scale was developed in four steps: item generation, expert feedback (n=6), exploratory factor analysis (n=289), and confirmatory factor analysis (n=169). Results show that the readiness to share consists of three dimensions. The first one, “access”, describes the preference to access goods without the need to own them. We suspect people scoring high on this dimension to have somewhat functional motives to share. They use sharing to fulfill a need. The second dimension, “pre-owned”, describes a general willingness to accept goods previously used by others. We hypothesize that people who score low on this dimension prefer to buy brand-new items over lending or buying something used. They might also hesitate to lend or rent goods to peers, lowering the probability that they will offer goods on sharing platforms. The third dimension, “conservation of resources”, states a preference for alternative modes of consumption. It is possible that people scoring high on this dimension use sharing to avoid buying new goods to save natural resources.

On a practical level, sharing initiatives can use the “readiness to share” scale to assess which dimensions are essential to their customers and tailor their marketing to them. For example, not all consumers score high on “conservation of resources”. To support sustainable sharing options, communicating benefits other than sustainability can be necessary to gain traction. From a research perspective, the dimensions help to explain that sharing behavior can be shaped by various internal or external factors, e.g., moral values or perceived cost.

Schor, Juliet (2016): Debating the sharing economy. In: Journal of Self-Governance and Management Economics 4 (3), S. 7–22.

Sharing is not always caring: Exploring paradoxes in peer-to-peer asset sharing

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Historically, sharing is based on altruism and social motives without the expectation of reciprocity or financial compensation (Belk, 2014). Digitalization has enabled the emergence of the modern sharing economy which includes many digital peer-to-peer platforms connecting private individuals for value exchanges (Be-noit et al., 2017). Initially, these platforms were built on the premise of reciprocity within the community (e.g., CouchSurfing) and fostering new social connections (Schor & Vallas, 2021). However, such platforms increasingly include and promote financial compensation for asset sharing (e.g., SnappCar) and previous studies show the relevance of economic motivations to participate in sharing as asset provider (e.g., Wilhelms et al., 2017) or asset user (Wilhelms, Merfeld & Henkel, 2017). Further, impersonal offers that enable exchanges without social interactions (e.g., through a lock-box) seem to be the most successful (Ertz et al., 2018). This raises the question to what extent contemporary sharing practices are still motivated by social or altruistic motives.

In this study, we explore the underlying motivational paradoxes of peer-to-peer asset sharing. In line with the increasing commercialization of the sharing economy (Eckhardt et al., 2019), previous research has shown user concerns about 'sharewashing' negatively affecting participation (e.g., Hawlitschek et al., 2018; Hazée et al., 2019). Further, previous investigations into consumer motivations remain contradictory as some highlight utilitarian motivations (e.g., economic) while others emphasize altruistic motivations (e.g., communal identification) (e.g., Münzel et al., 2019, Wilhelms et al., 2017). To explore these contradictions and demarcate specific motivational paradoxes, we apply a qualitative exploratory research design. First, we identify and describe common paradoxes (e.g., trust vs. anonymity, standardization vs. personalization, green vs. greed, economic vs. social) that have been highlighted in previous literature (Celata et al., 2017; Geiger et al., 2018, Stofberg et al., 2019). Second, we conduct semi-structured, in-depth interviews with users of peer-to-peer asset-sharing services in order to gain an understanding of these paradoxes from a consumer perspective and further explore which other service factors (e.g., attitude towards the service, situational) influence which side of the paradox is temporarily prioritized.

By providing more detailed, qualitative insights into consumer awareness of paradoxes in peer-to-peer asset sharing, our study contributes to the ongoing discussion of consumer motives in the sharing economy (e.g., Hawlitschek, Teubner, & Gimpel, 2018) and prepares the ground for further quantitative panel studies on the hierarchy and interaction of motivations to participate in peer-to-peer asset sharing. Further, our findings contribute to the services literature stream by emphasizing the link between perceived service quality and sharing economy participant motivations (e.g., Hazée et al., 2017; Hazée et al., 2019). By providing these insights, we further improve the managerial understanding of how consumers can be motivated to leverage the sustainability benefits of the sharing economy.

References available upon request.

Is mine really (y)ours?– Investigating psychological determinants, drivers and obstacles of the use of Libraries of Things

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Problem statement: Libraries of Things (LoT) represent a specific form of sharing economy. As the term implies, they work like traditional libraries where consumers may rent a wide range of products. The obvious environmental advantage of this business-model is that individually owned products with limited usage are replaced with a service that maximizes its utility (Botsman & Rogers, 2010). Unfortunately, as promising as the concept of a LoT may sound, it has not yet been embedded in consumers everyday life (Ameli, 2017; Sundararajan, 2016).

Research questions/aim: Up until now, LoTs have been primarily studied from a product design perspective (Ameli, 2017). The aim of this study is therefore to investigate psychological determinants of the usage of LoTs to help exploit its full potential. Moreover, the study seeks to identify the most important drivers and obstacles for the usage of LoTs.

Theoretical approach: Well-established theories in the area of sustainable consumption are used to predict usage intentions of individuals. First, based on the theory of planned behaviour (Fishbein & Ajzen, 1975), attitudes, social norms, and perceived behavioural control were expected to predict usage intentions. Second, the study included psychological ownership (Hulland et al., 2015) as additional potential determinant. Third and lastly, identification with the LoT and attitudes concerning the substitution of individual consumption are considered.

Methods/inquiry approach: The study was conducted in cooperation with a local library of a German city. Users and potential users participated in an online-survey. The final sample consisted of 142 persons (73% female). Open questions were used to identify potential drivers and obstacles for the usage of a LoT.

Findings: Results of a hierarchical regression analysis show that attitude, perceived behavioural control and psychological ownership significantly predict usage intention ($R^2=.82$). However, subjective norm, identification and substitution have no significant effect. Among other potential drivers of usage, actively supporting sustainability, saving money and getting suggestions for the use of unknown products were rated as most important aspects. Additionally, in the open comments, participants articulated that trying out new products, saving of resources and the feeling of liberating oneself from too much possessions are key aspects for the usage of a LoT. At the same time, limited availability of products, potentially restricted opening hours of the LoT and hygienic aspects are seen as main obstacles.

Conclusions, and practical and scientific implications: To conclude, this study broadens our knowledge on the usage of LoT by including psychological determinants and by identifying main drivers and obstacles. From a scientific perspective, future research can build on the present findings to further investigate the actual usage of LoTs rather than just usage intentions. For practitioners and local initiatives, the findings can provide insights for the promotion of LoTs. Specifically, promotion and information material should focus on psychological ownership and attitude of potential users. Drivers such as trying out new products and liberations from too much possessions should be underlined to gain new users of a LoT.

F05: Transforming the food system: Bottom-up governance in the urban arena

Session Chair: Alexander Laarman
Room: B: Orion, R: B3031 (max. 52)

How resilient are farmers' markets? A Stakeholders Network Analysis of the city of Bologna

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Strengthening rural-urban linkages improves the resilience of food systems worldwide. Farmers' markets (FMs) are one of the most representative examples of these linkages.

In Italy, City Councils can legislate on FMs. It is one of the areas where the local government has more scope to influence food supply. Local governments may grant trader licences, provide planning permissions for markets to take place and provide practical market organising logistics. Bologna's City Council has recently approved a new Regulation to manage FMs. Such new law recognises FMs as value-bearers but, albeit promoting some innovations, received cautious welcome from the stakeholders affected as it does not directly strengthen rural-urban linkages.

Research questions/aim

The present study aims to understand how resilient FMs in Bologna are, by analysing the nature of their stakeholders' relationships, focussing on rural-urban linkages. It addresses the following research questions.

1. What is the governance of FMs in Bologna, and how is it influenced by related policies at city and neighbourhood level? Who are the stakeholders involved and how they are related to each other in terms of influence, networks and power dynamics?
2. How is the urban-rural linkage considered in the governance of FMs in Bologna? How can the development of a Territorial Short Food Supply Chain around markets be supported?

Theoretical approach

Two theoretical frameworks underpinned the analysis: Sabatier's (1988) Advocacy Coalition Framework and Lukes' (1974) theories of power. As for the former, stakeholders are identified as part of an Advocacy Coalition when they share core values/beliefs to shift policy in a certain direction. Lukes' identified three types of power: decision-making power, non-decision-making power, and ideological power.

Methods

The following research steps were carried out.

1. Identify key stakeholders involved in the governance of FMs in Bologna
2. Interview the stakeholders identified to explore their roles, values and actions in relation to FMs using the Social Network Analysis methodology

A preliminary set of actors (from Civil society, Politics and administration and Food economy) were identified. After the identification of stakeholders, face-to-face interviews were carried out.

The interviews consisted of three main steps. First, a selection of stakeholders who are or are not relevant for the respondent is carried out. Second, relationships between the selected stakeholders are drawn (supporting, contrasting or commercial). Third, relationships' motivations and rating of the strength of influence (1-5) were asked.

The interviews resulted in stakeholders map that were transposed on an Excel file, then uploaded to the software Gephi.

Findings and implications

A total of 5 interviews have been carried out so far, and more are planned. Preliminary results of the stakeholders mapping show how FMs resilience is strongly linked to the number and the quality of relationships the organisers can establish and maintain. Associations organising FMs are very different in this and therefore have highly divergent levels of resilience. The research originally contributes to the literature on FMs and has implications for policymakers willing to improve FMs policies.

Impacts of urban gardens on meanings of consumption and the environment.

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As we are still not on track to achieve environmental sustainability, we need to further stress the importance of understanding routinized types of behaviour of private households, corresponding consumption of resources and the resulting environmental impacts. Social practice theories allow us to understand the constitution of human behaviour, its embeddedness in socio-technical systems and the interconnection between various routinised behaviours. In research on sustainable consumption, the relevance of social practice theories has been recognized. However, there is still a lack of understanding the corresponding environmental potential of changing social practices. We propose a framework that combines qualitative analysis to understand changing routines by using social practice theories, with quantitative environmental assessment by using life cycle assessment. In a case study on urban gardening, it can be shown how a new meaning of 'enough', that appears in the emerging practice of urban gardening, is affecting other social practices, such as traveling and doing groceries. The environmental potential of urban gardening, hence, exceeds the issue of growing vegetables, as a cultural shift from 'über-availability' to 'enough' could be observed. It can be concluded that zooming out of social practices has many advantages over more traditional approaches in life cycle assessments, such as including specific rebound effects. One advantage is the more comprehensive and open inclusion of higher order effects. Another advantage is the ability to address transformational change, instead of only incremental change that is being assessed by oversimplified approaches such as income elasticities (for monetary rebound effects) or marginal demand/supply (for consequential life cycle assessment). Difficulties appear in defining consistent system boundaries for quantitative environmental assessments, which leads to an inability of comparisons. Further research is necessary in order to ontologically understand the role of materials in social practices and in life cycle assessments. Further discussions are necessary in order to clarify what this new approach to sustainable consumption means for further research designs (e. g. intervention vs. observation), research questions (e. g. focusing on practices, meanings or materials) and funding of projects, as very interdisciplinary research (engineering and social sciences) often eludes traditional funding schemes.

Policy instruments for urban circular food systems: a systematic literature review

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Breaking the linear produce, consume, dispose chain is often mentioned an important element for sustainable local food systems. Therefore, circularity is an increasingly popular concept when thinking about the future of food systems. Creating more circular food systems (CFS) is a major challenge, for which an increasing amount of cities has invested in developing policy instruments to make food systems more circular and sustainable. As food systems are very context dependent, different cities will use different sets of tools and mechanisms through which governmental authorities attempt to steer actors in the food system to make it more circular. However, there is limited systematic knowledge on how different policies contribute to more circular food systems, as well as the wide range of instruments that is already being implemented. Therefore, we conduct a systematic literature review of academic publications to describe how policy instruments can contribute to more circular urban food systems. The literature review follows the protocol for Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), and coding of policy instruments is done using the software Atlas.ti. Following this review, we first provide an overview of the academic field, by looking at the number of publications, the distribution across academic fields, and geographies. Second, we synthesize which types of CFS policy instruments are proposed or implemented; what their policy goals are; which aspects of food systems are prioritized; and how circularity in relation to these different instruments is appraised or evaluated. The findings outline our current understanding about CFS policy instruments and governance tools, providing lessons and insights about how different CFS policy instruments work at the local level, and how they are embedded or related to other policies, either at the local, regional, national or international level. Moreover, we conclude by discussing the wider trends that emerge from the current developments in CFS policies. Thereby offering a systematic overview for both practitioners and scholars working toward more circular food system.

Understanding multilevel trade-offs in the sustainable transition of local food systems

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Problem statement: Urban and metropolitan food systems are primarily responsible for pollution, resource depletion and biodiversity degradation. However, they are also an important source of income and employment. A sustainable transition of urban and metropolitan food systems should contain their environmental impact while supporting income and employment. Due to the length and complexity of the supply chains, any change in food consumption patterns within a metropolitan region can produce environmental and socioeconomic effects in other sectors, regions and countries. **Research question/aim:** This paper introduces a new theoretical and methodological approach to investigate the sustainable transition of urban and metropolitan food systems. Any change in private consumption patterns and public procurement policies within these system causes substitution effects between products of different types and origin. To evaluate the actual sustainability of these choices, the environmental and socio-economic impact produced along these different supply chains must be considered. **Theoretical approach:** The theoretical framework builds on the input-output and food systems literature to incorporate the role of the main actors of urban and metropolitan systems in the analysis of the environmental and socioeconomic impact of food supply chains. Their preferences and choices are attributed a central role to incorporate substitution effects between different food products and related multilevel environmental and socioeconomic effects. **Methods/inquiry approach:** A systemic and actor-centred perspective is applied to investigate how the preferences and choices of private households and metropolitan governments drive a change in production patterns along the entire food supply chain. The analysis focuses on the existence of substitution effects underlying consumption choices to identify potential trade-offs. **Findings:** The approach proposed identify the existence of potential implicit trade-offs between local and global, environmental and socio-economic effects that occur along different food supply chains. These complex and multilevel trade-offs impose the adoption of a systemic perspective and the use of modelling and simulation techniques which attribute a central role to demand and preferences. **Conclusions:** In conclusion, a comprehensive analysis of the sustainable transition of urban and metropolitan food systems must attribute a central role to the choices of the main actors within these systems and consider the existence of potential complex and multilevel trade-offs between environmental and socioeconomic effects at the local and global level. **Practical and scientific implications:** Consumers and governments in urban and metropolitan centres have a fundamental role in driving the sustainable transition of food systems. Any change in their preferences and consumption choices can alter production patterns and transform food supply chains. To understand the full extent of this transformation, the direct and indirect effects at the local and global levels need to be considered.

Beyond the single narrative: Transforming the preconceptions of circularity for inclusive urban food systems through experiential learning

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Circularity cannot be an exclusive practice in the urban context. Circularity depends on drastically reconfiguring the practices and processes of production and consumption by rethinking how people make use of and relate to environmental resources (e.g. food, water, energy) in their daily practices. However, the access to resources and daily practices of people who make up an urban space are not uniform. When it comes to food, the inclusion of society is especially pertinent as it is not only attached to everyone's biophysical needs, but also their individual and social identities. Needs and identities make access to food critical while at the same time, making changes to consumption practices difficult. Thus, to achieve a 'waste-free economy,' as the Dutch government committed to in the National Agreement on the Circular Economy, while addressing people needs, all levels of society need to be considered in the transformative processes. How do we then involve the narratives of different people in the city when it comes to making food practices more circular? How do we ensure that urban planners, technical designers, and urban decision-makers striving for circularity account for the needs and obstacles experienced by marginalized members of society?

Through an EWUU seed fund, researchers from Wageningen University & Research, the Technical University of Eindhoven and Utrecht University worked together to unpack these narratives through tapping into the experiences of different society members using bread as a boundary object. In this session, they will give a taste of how they developed and shared narratives through interactive experiential settings around the topic of bread. The goal of these interactive settings was to make the different obstacles and needs faced by members of society more tangible as cities attempt to transition to more circular and sustainable urban food practices. These combined approaches provided new and creative ways to understand where sustainability goals for circularity are incongruent with the heterogeneous needs of the people that make up the urban context. As such, this research can contribute to more inclusive circular urban food practices and policies.

F06: Circular Economy and Food Systems

Session Chair: Cindy Isenhour

Room: B: Omnia, R: Podium (max. 269)

Industry 4.0 Implementation: Critical Factors and Impacts on Agri-food Circular Economy Performance

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Industry 4.0. (I 4.0.) is a very broad concept related to the digital transition led by the Fourth Industrial Revolution. While most academic literature presents the implementation of specific technologies and sector or process digitalisation, only a few authors focus on its managerial perspective. Therefore, there is a lack of systematic understanding of the critical factors needed to implement I 4.0. considering corporative strategies. Notwithstanding, advanced and digital manufacturing technologies can unlock the circularity of resources, despite the fact that the interrelation between circular economy and I 4.0. is still unexplored. This article takes a new approach to systematising the implications of I 4.0. adoption to the circular economy performance of companies. I 4.0. can help companies to rethink the way they develop, produce and sell products, facilitating the smart use and recovery of natural resources. Therefore, the main objective is to identify critical success factors to be endorsed by the management team in industrial organisations to quickly adapt, and increase performance and competitiveness with Industry 4.0., while improving the sustainability indicators of the business. A particular focus is on the agri-food industry- if and how the factors for digital transition are applicable for this sector, considering its I 4.0 infancy.

Critical success factors for Industry 4.0. were obtained through the Systemic Literature Review method (SLR) with PRISMA protocol, followed by qualitative data analysis with NVivo to further assess how those factors differ in the agri-food sector. In the present work, 8 critical success factors for I 4.0. have been revealed from the PRISMA method: 1) strong leadership, 2) well-defined management strategy and team commitment, 3) organisational culture ready for changes and adaptation, 4) establishment of Management Information Systems and agile project management, 5) high level of cyber security, 6) cross-lined product life-cycle and focus on consumer relations, 7) respect of sustainability (and more precisely circular economy) and 8) regional specifics. One additional factor, social innovation, could also be defined as critical for the agri-food sector.

Our study suggests that before implementing I 4.0. managers should scrutinise the current business model and then devise strategies to align the existing ones with I 4.0 initiatives. Managers can further use each of the critical factors identified in this study, with special attention to sustainability, as a guiding framework to successfully implement I 4.0. in their organisations. The agri-food sector would additionally benefit from considering social innovations in its portfolio of strategies to implement I 4.0. (hereafter denominated as Agriculture 4.0.). This is an important contribution of our study since previous studies confirm that the narrative of Agriculture 4.0 has been primarily focused on productivity improvement and environmental protection, generating both positive and negative social effects. In that sense, a greater inclusion of people in

agricultural innovation systems must be guided by responsible principles within a vision of social sustainability, ultimately contributing to a broader strategic development.

Assessing risk and building resilience to facilitate the transition towards circular food systems

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There is potential for circular food systems to improve quality of life for humans, farmed animals, and ecosystems. However, increasing circularity in the food system brings with it novel risks that should be managed to avoid negative unintended consequences. Under circularity, the interconnectivity of food subsystems is likely to increase. For example, waste streams are proposed to be used as feed or fertilizer. Creating such loops brings novel risks that may become reinforcing. Risk is interdependent across system scales and may related to animal welfare, pollution, spread of disease, or international trade. If these risks are not identified, managed, and regulated, the project of transition to circular food systems may be undermined. We propose a new, multidisciplinary framework for managing and governing risk within circular food systems, more specifically within the EU including the context of the Green Deal. Our framework places an emphasis on building resilience of food subsystems as a pathway to managing risk. We explore how the current movement toward restructuring of interconnections within the food system to increase circularity may introduce novel and unintended risk factors, and how this connectivity can be managed to mitigate these risks. We outline how risk owners can be identified and connected to improve governance across food system scales. Finally, we explain how resilience principles can be applied to manage changing risk associated with transition to a circular food system.

Assessing the environmental implications of sustainable and circular public procurement food

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Recent studies have addressed the use of sustainable public procurement (SPP) as an efficient tool to improve the sustainability of the food system, as it is one of few regulatory instruments to influence sustainability along the supply chain. Despite the many claims of how sustainable certain procurement practices may be for food, few studies have assessed the implications that different interventions have on the sustainability of SPP of food. This study has aimed to understand and analyze the environmental implications of the SPP of food from the Jämtland region in Sweden. This is done employing an environmental-spend analysis (ESA); an approach that combines purchasing data and life cycle analysis (LCA). A baseline year from 2020 procurement data was used for the study. We assessed the baseline, and furthermore, scenarios are included to improve both sustainability and circularity of food procurement. These include increasing organic and local foods, reducing certain food types (meat), and expanding others. In addition, circularity is assessed through reducing food wastes, focusing on packaging, and new waste handling approaches.

Results from the assessments suggest that targets for organic foods may not entirely lead to large GHG emissions reductions, which may be counterintuitive to the narratives used by local politicians. Instead, expanding the use of regional foods, e.g. local wild-game meat, reducing food waste, and valorizing waste streams can greatly reduce environmental impacts from the food procured for the region. Local and organic foods also largely reduce potential biodiversity damage and toxicity.

These results suggest that a focus limited to climate impacts and share of organic foods may not be holistic to address sustainability for food systems. The results also provide insights to procurement officers on focus areas to promote more sustainable procurement processes and for increased LCA data to ensure that better decisions can be made without shifting burdens.

Households' food consumption and waste disposal in the context of circular economy in a Brazilian neighborhood: A preliminary and exploratory study

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Given the current lifestyle in which consumption is deeply encouraged and the waste volume is substantially increasing, the need for collective sustainable responses has become critical. The circular economy is an alternative model of production and consumption that rethinks economic practices and introduces a new paradigm to society. However, the role of consumers in this alternative model is still underexplored. Therefore, it is crucial to deepen consumers' action in the circular economy, understanding that they also would bring an effective collective contribution. Hence, this research aims to map the Households' food consumption and waste disposal in a circular economy considering available information for residents and the Michie et al. (2011) COM-B model (Capacities, Opportunities, and Motivation for Behavior change). The chosen community for the study is a Brazilian neighborhood located in the Federal District of the country called Jardins Mangueiral (JM). The JM is the first neighborhood from a Public-Private Partnership (PPP) in Brazil, which includes 15 housing condominiums, computing 8,000 middle-class housing units in total. It is a unique and innovative concept of housing in Brazil following environmental sustainability principles. Here, we present the preliminary study of the research, under a qualitative approach, by interviewing residents of one of the 15 condos to identify the dimensions of the COM-B model. The criteria for choosing the condo followed the results of a recent contest promoted by the neighborhood residents association. The contest awarded the condo responsible for adequately collecting more recyclables waste in three months. So, the contest winner was the condo called Jardins Tinguis, our pilot study target. We conducted 20 interviews with residents responsible for their households, balancing their gender. Among the results, after the content analysis of the interviews, we identified a lack of clear information about waste disposal and local food producers available. Also, they showed weak concern about choosing more sustainable food packages or types. Related to the COM-B dimensions, we identified that the condo provides the infrastructure for the selective collection of six different materials (organic, oil, paper/plastic, metals, batteries, and reject) and regularly informs the residents about the importance of separating the waste (i.e., capacity and opportunity). However, the residents' motivations are still weak, showing the need for new interventions and approaches toward behavior change. The main contribution of this study is to provide the inputs for a questionnaire to be surveyed among at least 80% of the condo residents. After the survey, we plan to statistically test the COM-B to implement more conscious practices and the circular economy.

F07: Systemic solutions for avoiding packaging waste (2/2)

Session Chair: Elisabeth Süßbauer

Room: B: Omnia, R: Spectrum (max. 30)

Returnable packaging in life cycle assessments

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Reusable packaging is seen as an approach to reduce the environmental burden of packaging. But the possible reduction is highly dependent on the behaviour of consumers, as they must return the packing. Life cycle assessments (LCA) is a widely used method to assess the environmental impact of among other packaging, but the choices made by consumers are so far not extensively considered in the available studies.

Based on an analysis of LCAs concerning take away food and beverages packaging recommendations for inclusion of consumers behaviour into LCA were developed. The example of take away food and beverages packing were chosen as reusable packing option for them are widely available, even as they are not the standard. The aim of the research was to give a comprehensive overview of the current state and make future environmental analysis of reusable packing more comprehensive.

For the overview the LCAs were analysed regarding the consideration of consumers in the modelling of the use phase and end of life phase. None of the reviewed LCAs included a complete picture of consumer behaviours and further the depth of implementation varied significantly. It can be concluded that currently the topic is not considered explicitly in available LCAs and future studies need to addresses this topic more widely. This is especially imported for the comparison of single-use and reusable take away packaging, as the studies shows consumer behaviour has a significant impact on which system has a potential lesser environmental impact. Therefore, the data on which the assumptions regarding consumer behaviour are needed to be chosen carefully. With the help of instruments of the social sciences the basis for assumption could be improved. Further, with the arrival of digital supported pool systems for take away packaging a clearer picture of the reuse rate could be drawn

Reusable Take away packaging: a comparison of different scenarios

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The paper addresses the worldwide problem of an ever-increasing consumption of disposable take-away packaging with associated items such as cutlery, mugs, lids, etc. That is, products that are used for a very limited time and certainly fulfill a function, but have too short a lifespan to justify the consumption of resources. The previous European Parliament's vision of the 2020 Green Market for Products and the Sustainable Products Initiative (SPI) has been updated by the new European Parliament and the European Commission has recently presented several different proposals for new policy and product-related legislation and initiatives for sustainable products and packaging. In Sweden, new national regulations for packaging have been launched in order to reduce single-use packaging that require reusable packaging to be offered for all establishments serving take away food.

Deposits for the reuse of take-away packaging have existed for a long time in other countries but in the Swedish market, initiatives have appeared relatively recently and at the local level, Reasons for this may be that it is only now that interest in this issue has become great in Sweden and that there is ambiguity about the environmental impact of the entire system that is needed for reuse of packaging. Here, the debate centers around the environmental impact of the use of reusable take away packaging from all processes that are required from the manufacture of reusable packaging to the (potential) number of rotations, transport and redistribution between actors, cleaning, as well as waste after use.

In the project, we have conducted a literature review and a quantitative lifecycle analysis to analyse the advantages and challenges of reusable packaging within different systems from those that are deployed in cities and are open for all actors to those in which end-consumers bringing their own packaging. The study results in a comparison of reusable packaging types, as well as recommendations for applying the reusable packaging systems.

Triadic reuse systems: How do packaging-as-a-service providers balance restaurant and consumer demands?

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The COVID-19 pandemic exacerbated the consumption of single-use packaging for takeaway food (Kochańska et al., 2021), which was initially driven by faster and more convenience-seeking lifestyles (Jiang et al., 2020). This poses environmental challenges both in terms of resource use and waste generation (Kleinhueckelkotten et al., 2021). Packaging-as-a-service (PaaS) providers tackle this issue by establishing systems for reusable takeaway food containers, in which containers circulate between PaaS providers, partnering restaurants, and consumers. In doing so, PaaS systems apply aspects of triadic frameworks of collaborative consumption (Benoit et al., 2017), the triadic business model (Andreassen et al., 2018), and access-based services (Hazée et al., 2017). As suggested by research on two-sided markets, PaaS system providers have to optimize their services to “get both sides of the market on board” in order to succeed (Rochet & Tirole, 2003). To this end, PaaS providers need to reconcile potentially divergent demands of restaurants and consumers. Therefore, this paper addresses the following research question: How do PaaS providers design access-based triadic systems for reusable food containers that attract both restaurants and consumers?

To investigate adoption intentions of restaurants and consumers, this paper takes a mixed methods approach. First, seven influence factors are qualitatively derived from interviews and focus groups with both market sides. Afterwards, the effects of these influence factors on adoption intentions are quantitatively tested in two factorial survey experiments with restaurants (N=176) and consumers (N=245). Results show that restaurants' adoption intentions are most strongly influenced by the availability of food containers that are customized to the meals they serve. While customized containers also positively influence consumers' intentions to use PaaS systems, consumers' adoption intentions are most strongly affected by the market mediation mechanism, i.e. whether the PaaS system is app-based or uses cash deposits. Moreover, PaaS systems with a larger network of partner restaurants and users are more attractive for both target groups. Finally, introducing additional options for accessing and returning containers – by integrating delivery services or establishing return stations – has a moderate positive effect on consumers but no significant influence on restaurants. In sum, these results highlight the need to develop two distinct value propositions tailored to restaurants and consumers, respectively. By examining how PaaS businesses provide access-based services in triadic systems, this paper builds on and links theoretical accounts of dyadic access-based services and triadic collaborative consumption frameworks (Benoit et al., 2017; Hazée et al., 2017; Hazée et al., 2020), which are usually treated as conceptually separate. Moreover, by using factorial survey experiments we present quantitative insights in an area largely dominated by conceptual and qualitative research. In addition, this research addresses the need to expand the literature on reusable food and beverage containers beyond the consumer perspective and highlights practical implications for the design of effective PaaS systems that attract restaurants and consumers alike. Only by convincing both sides of the market, triadic reuse systems can scale and successfully combat waste from single-use packaging.

Governing niche innovations for sustainability: The case of reusable food packaging

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The increasing consumption of disposable food packaging, albeit essential for protecting, containing and ensuring the performance of global food supply chains, and mismanagement of (plastic) packaging waste are posing severe challenges to the environment and societies. Circular economy approaches, such as recycling and reuse, have been suggested as solutions in transitioning to more sustainable production and consumption. While packaging recycling has already advanced in the society, reuse is still its infancy. Yet, in the European Union (EU) the political pressure is rising to favour and foster packaging reuse, particularly in the context of curbing single-use plastic (SUP) packaging consumption, as recent and upcoming regulatory changes (e.g. SUP directive and the amendment of the packaging and packaging waste directive) indicate. Despite of policy drivers, the packaging reuse is still facing several challenges and lock-ins hindering the system-level transformation.

In the sustainability transitions literature, both niches and business model innovations have been identified as ways to promote and advance transitions but often niches require support to challenge the existing regime and overcome path dependencies. In studies on the governance of transitions, several ways and approaches (e.g., strategic niche management) have been identified to support or accelerate the niches. However, the majority of current studies focus on technological innovations and niches. This presentation adds to the limited, yet growing body of literature by discussing governance of business model innovation. We aim to shed light on how public policies can foster the uptake of reuse business models within sustainability transformation in the context of food packaging.

The study is based on a qualitative case study on reusable food packaging governance in the EU and Finland. The main data source was expert interviews of both European start-ups offering reusable food packaging solutions (7), authorities (7) (Finland and the European Commission) and other stakeholders, including producer responsibility organisations and trade and industry associations (7). Data collection also entailed mapping governance approaches, including policies and instruments from the European Union, Commission and Parliament, and Finnish ministries with relevance to reusable food packaging. The data collection lasted from 2019 to 2022.

Our preliminary results indicate that there is a dichotomy between current policy goals and actions. Despite of increasing policy interest, the packaging governance mainly focuses on improving packaging recycling rather than striving for a system-level change in food retail and consumption cultures, required for the uptake and acceleration of reusable packaging solutions. The SUP directive has been a significant driver and created business opportunities for start-ups, particularly in countries that have imposed binding reuse targets for takeaway food packaging. However, the breaking from single-use culture requires further policy incentives and governance approaches, like supporting experimentation and value chain collaboration. To conclude, there is still little evidence on wider niche support or regime destabilisation, needed for transition.

F08: Energy Citizenship

Session Chair: Edina Vadovics

Room: B: Omnia, R: Quantum 3 (max. 30)

Exploring the evolving energy citizenship landscape: A PESTEL analysis of EU-level context factors

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Whilst the technological and infrastructural dimensions of energy transitions have been charted into considerable detail, much remains to be clarified about the changing roles of individuals in these transformation processes. A key notion is energy citizenship. Marking the shift from passive consumer roles to more active political implication in energy systems (Devine-Wright 2007), it offers a prism through which to study transformations in individual agency. Importantly, such individual-level analysis is only useful for transitions research if it is integrated into broader analyses of system evolution. This contribution rises to the challenge by analyzing the evolving energy citizenship landscape. Sidestepping the reductionism that keeps haunting analyses of socio-technical 'landscapes' (Upham et al. 2022) and transversal, 'deep' transitions (Kemp et al. 2022), we have taken the rather inductive approach of PESTEL analysis. Developed originally to analyze context factors for enterprises, this is a broadly scoped method to identify key Political, Economic, Social, Technical, Environmental and Legal context factors. Focusing on the EU context, we have identified and clustered main factors and sub-factors through iterations between a corpus of policy documents, academic literature on energy citizenship and energy transitions, and media coverage. After further validation and assessment by a panel of experts, weighted factors have been computed through DEMATEL and AHP methods. Comprising 6 main context factors and 30 more specific sub-factors, the resulting mapping provides concrete foothold for the anticipation of possible energy citizenship futures. Providing a particularly wide, theoretically parsimonious and balanced assessment of factors, this explorative analysis provides building blocks for further integrative, systemic analyses. Furthermore, our exploration of macro-contexts also feeds back into the conceptualization of energy citizenship itself: Different energy citizenship landscapes drive towards different kinds of individual, group-based and organizationally embedded modes of energy citizenship.

References:

Devine-Wright, P. (2007). Energy citizenship: psychological aspects of evolution in sustainable energy technologies. In *Governing technology for sustainability* (pp. 63-86). Routledge.

Kemp, R., Pel, B., Scholl, C., & Boons, F. (2022). Diversifying deep transitions: Accounting for socio-economic directionality. *Environmental Innovation and Societal Transitions*, 44, 110-124.

Upham, P., Eberhardt, L., & Klapper, R. G. (2020). Rethinking the meaning of “landscape shocks” in energy transitions: German social representations of the Fukushima nuclear accident. *Energy research & social science*, 69, 101710.

Pathways to energy citizenship: the results of citizen action labs across Europe

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How to engage diverse groups of people in the energy transition in Europe is a pressing issue, one that requires grappling with the role of individuals and collectivities in social change dynamics. Based on the results of nine multi-form Citizen Action Labs across eight European countries, this paper details the different ways in which energy citizenship was experimented with, and what learnings can be gained for supporting or hindering energy citizenship in the future. Based on an analysis of survey data, national reports, and interviews with consortium team members, we tease out key issues that are relevant for further understanding what 'energy citizenship' entails. We see several points of tension, for example: 1) understandings of how social change occurs, from more individual to more collective forms of action; 2) what aims are put forward, from a just transition to other agendas for environmental or social outcomes; or 3) what solutions are preferred, from more market-based solutions to more transformative ambitions. These points of tension reveal dominant narratives about the energy transition and how they are contested or maintained through the roles played by everyday people, and how this relates to broader understandings of power and structural issues. Ultimately, pathways to energy citizenship entail reclaiming spaces for people to engage with energy issues, while also redefining responsibility at different scales. This leads to conclusions on how to ensure a just energy transition with and for citizens. The results provide impetus to a more long-term perspective on how to support and maintain over time a deep and inclusive energy citizenship engagement, towards net zero 2050 in Europe.

Empowering resources from initiatives linked to energy citizenship

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In recent decades, social transformations are arising as a result of the need to respond to the main challenges raised at the United Nations General Assembly in 2015, prior to the signing of the 2030 Agenda agreement. Among the Sustainable Development Goals (SDGs), two of them are clearly linked to energy access and use: on the one hand, ensuring access to affordable, safe, sustainable, and modern energy for all (SDG 7) and taking urgent action to address climate change and its impacts (SDG 13).

In Europe, the response to these challenges and the promotion of energy citizenship are reflected in the European Climate Pact, as part of the Green Pact, which is committed to involving citizens in climate action through a series of packages and initiatives that promote energy transformation (European Commission, 2020). From this proposal, it is essential, on the one hand, to empower citizens to make more informed consumption decisions, to use energy efficiently and to make optimal investments and, on the other hand, to implement the Renewable Energy Directive (RED II) and the Internal Electricity Market Directive (IEMD) that promote the development of a new role of the consumer as a prosumer. In that context, the interest in knowing how individuals experience, through initiatives that contribute to enhancing energy citizenship and participation of citizens, processes of individual and collective psychological empowerment is one of the topics being explored on in the H2020 EnergyPROSPECTS project (Pel et al., 2022)

This research aims to improve the understanding of the elements and resources that helps to empower people to be active energy citizens, as well as to identify the disempowering elements that arise within the initiatives. To this end, 13 in-depth interviews were conducted in Spain and the Netherlands with key informants who are currently actively involved in initiatives related to energy citizenship.

Preliminary findings point to the importance of materials (e.g. having access to financial resources, especially for vulnerable groups, as well as funding support and a more structural financial support from local governments), knowledge (especially technical, political and social, as well as expertise and advice on energy and cooperativism, to translate policy into practice, to raise the voice of local residents in policy, to strengthen local dynamics and the needs of local people closer to policy), social (especially surrounding oneself with like-minded people) and power resources (e.g. increasing volunteer work; contributing to the creation of energy communities; securing structural funding (e.g. from the city council) to pay volunteers who work "unpaid"). Having these empowerment resources available through initiatives is key to interacting in the wider energy system, increasing agency and decision-making capacity, addressing disempowerment and, above all, shifting power from institutions to communities.

In need of intermediation: the role of in-betweeners in goal achievements of energy citizenship initiatives

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Achieving a zero carbon energy future is hardly possible without an active role of citizens - understood as energy citizenship - and their surrounding support networks. In these networks, the work of intermediaries in fostering energy citizenship remains largely underappreciated and understudied. Research into the factors of successes and failures of intermediary work will help to further understand the conditions and mechanisms that shape the active involvement of citizens in energy transition. Intermediaries are nodes of the emerging energy networks that contribute to making a great transformation of the energy system possible, but those nodes remain invisible (Kanda et al. 2020). By focusing on intermediaries and their activities, this paper makes those intermediations more visible and contributes to a deeper understanding of them as key network nodes.

The paper applies a 'relational' lens to the study of intermediaries, highlighting both the networks that already exist and the relations that intermediaries are part of. This is based on the wider work of Doreen Massey that conceptualises space as relational, constituted through social and material relations. A relational perspective highlights how the networked nature of intermediaries produces 'geographies of connection, dependency and control' (Bridge et al., 2013:333).

Methodologically, the paper relies on a multi-methods approach. It is primarily based on 20 in-depth case studies in nine European countries. Case study selection draws on the results of a Qualitative Comparative Analysis on the conditions for goal achievement of collective forms of energy citizenship in citizen-driven or hybrid organisations (Schmid et al. 2023), which included several conditions on intermediation. Data for these in-depth case studies were collected via desk research and in-depth interviews.

Preliminary findings highlight the need for various types of intermediation in energy citizens' initiatives. Especially, intermediation was found to be fundamental when initiatives required technical knowledge, translating policy into practice, financial advice, or when they wanted to achieve institutional change via collective action. Among their many roles, intermediaries were characterised by the study participants as bridge builders, mediators, boundary crossers, translators, advisors and facilitators of innovation. Finally, intermediation did not only have positive results as failed intermediation was experienced in some cases, mainly with regard to activities that required financial/funding expertise to achieve their goals.

Overall, the paper contributes to a more detailed understanding of intermediaries as in-between actors and intercessors, shedding light on intermediary relationships that are less visible. Intermediation was found to be more than just an interaction-based process. Their role was found to be instrumental for many energy citizen's initiatives in achieving their goals and in contributing to a more fair and sustainable energy production, consumption and governance.

References

Bridge, G., Bouzarovski, S., Bradshaw, M. and N. Eyre (2013). Geographies of Energy Transition: Space, Place and Low-Carbon Economy, *Energy Policy* 53: 331–340.

Kanda, W., Kuisma, M., Kivimaa, P., Hjelm, O. (2020). "Conceptualising the Systemic Activities of Intermediaries in Sustainability Transitions." *Environmental Innovation and Societal Transitions* 36: 449-465.

Schmid, B., et al. (2023 forthcoming). The influence of remote and proximate conditions for energy citizenship outcomes. Deliverable D4.3 Energy EnergyPROSPECTS-PROactive Strategies and Policies for Energy Citizenship Transformation Horizon 2020, Grant Agreement number: 101022492.

From ideal-types to empirical cases: deciphering energy citizenship in Europe for a just and sustainable energy transition

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With the energy crisis induced by the war in Ukraine and adding to the already severe challenges posed by the climate crisis, the necessity and emergency of the European energy transition has become even clearer, accompanied by stronger claims that citizens play a core role in this process. Despite of the often-acknowledged significance of citizen involvement for the necessary energy transitions in and beyond Europe, the concept of energy citizenship is not well defined yet. To tackle the uncertainties and the associated risk that energy citizenship might become an empty buzzword, the H2020 EnergyPROSPECTS project aims at systematizing the diversity of the existing and/or upcoming forms of energy citizenship that are able to contribute to a just, democratic and environmentally sustainable energy transitions (Pel et al. 2021).

With that purpose, our conceptual typology suggests ten ideal-types that differentiate forms of energy citizenship according to two dimensions: the individual or collective agency and the reformative or transformative outcome orientation. Whilst the former dimension distinguishes between the individual at the household level, as organizationally embedded or as being part of public processes, the outcome-orientation encompasses a bundle of attributes such as incremental or radical change, low or high level of energy democracy and shallow or deep environmental sustainability (Debourdeau et al., 2021).

This conceptual typology guided the mapping of almost 600 empirical cases of energy citizenship in Europe. The mapping was carried out by the multi-disciplinary research team of the EnergyPROSPECTS project, following a collaboratively developed standardized set of methods (Vadovics et al., 2021). As part of the methodology, each of the components of the agency and the outcome-orientation dimensions that are the basis for the 10 ideal types were investigated.

This approach enables the validation of ideal-types with a large number of empirically observable forms of ENCI. The data collected has been analyzed using quantitative and qualitative methods. Quantitative analysis included converting the data into an SPSS database, creating different statistical disaggregations of the data and performing significance tests on them. Qualitative analysis comprised of analyzing case researcher comments and observations. The analysis provides a number of insights. For example, it shows which part of the empirical cases can easily be assigned to a certain type or are hybrids of two or more types. Empirical forms of ENCI which cannot be assigned to an ideal-type allow for the refinement of the typology dimensions. We found that it largely confirms the validity of the reformative or transformative outcome orientation dimension of the typology, but also enables to go deeper in their description.

Beyond the validation aspect, the empirical analyses also contribute to the understanding of the continuum between reformative and transformative outcome orientation as well as that between individual and collective forms of energy citizenship. By confronting ideal-types with their empirical manifestation, this research offers a rich picture of the potential contribution of energy citizenship to a just and sustainable energy transition as well as new possible energy-policy pathways.

F09: Behavioral perspectives on consumers' sustainable food choices

Session Chair: Katarzyna Stasiuk

Room: B: Atlas, R: Atlas 2 (max. 80)

Breeding by intervening: Exploring the role of associations and deliberation in consumer acceptance of different breeding techniques

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New plant breeding techniques may play an important role in the production of sustainable, high quality consumer foods. New plant breeding techniques such as gene-editing can be used for developing crops resilient to climate change, thereby protecting food security against extreme weather conditions such as extreme drought (Shi et al., 2017). In addition, new breeding techniques may increase yield, reduce the need for pesticide and fertiliser, and thus may also contribute to the reduction of agricultural greenhouse gas emissions (Smyth & Wesseler, 2022). In spite of the potential sustainability gains previous DNA based breeding techniques, most notably genetic modification, have been hardly allowed in the EU as a consequence of substantial resistance from consumers. To avoid similar resistance, it is crucial to understand if and under what conditions and for what purposes consumers may accept the next generation of plant breeding techniques, such that they can be implemented and contribute to a sustainable way of agriculture.

Most past research has considered elaborated responses of consumers on gene techniques. Given that consumers are found to have limited knowledge of breeding techniques, in reality they often rely on quick associative responses when evaluating breeding techniques. Associations may thus play an important role in understanding how consumers evaluate breeding techniques. Associations with plant breeding techniques are however hardly investigated. Therefore, this study explored the role of associations in consumer evaluations of (new) breeding techniques and how associative responses compare to deliberative responses by conducting six focus groups. A total of 45 participants in 3 European countries: the Netherlands (n=16), Italy (n=16), and Czech Republic (n=13), participated in 6 focus groups. Each focus group examined consumer associations and deliberations of six breeding techniques through individual tasks and group discussion. The breeding techniques examined were 1) Cisgenesis (variant of genetic modification); 2) Transgenesis (variant of genetic modification); 3) Conventional breeding; 4) CRISPR-CAS9 (subtype of gene-editing); Synthetic biology (synthetically composed genes) and 6) Marker-assisted breeding (non-invasive breeding tool). Associations were measured through a written spontaneous word listing task. Deliberations were derived through content coding of the transcripts from the group discussion. When participants rely on spontaneous associations, they evaluate gene-editing similarly compared to genetic modification. However, after information provision and group discussion,

participants differentiated between these techniques, and they preferred gene-editing over genetic modification. Perceived naturalness was the main reason for the different levels of acceptance. Naturalness already occurred in the spontaneous associative responses, where genetic breeding techniques were associated with artificiality, whereas conventional technique (cross pollination) was associated with nature. These findings show that beliefs about naturalness remain crucial in understanding how consumers evaluate breeding techniques, they also highlight the importance of associations. We show that initial associations may obscure differences between new breeding techniques in the eye of the consumer, which unchecked may lead to re-emergence of the debate and potential rejection of these new techniques.

Consuming seaweeds: in the laboratory and beyond

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This paper is part of an interdisciplinary project investigating seaweed as a new food in a Swedish context. Seaweed is commonly portrayed as ecologically sustainable and its cultivation has started to attract interest in the Nordics, linked to developments towards sustainability. In contrast to Asian cuisines, where seaweed is a well-established ingredient, consumers in Sweden have fewer experiences of eating seaweed and it is regarded as a niche product. Research has shown that studies on the acceptance of new foods tend to focus on product attributes and consumer characteristics, and it has been suggested to shift focus to the context instead. This paper brings the qualitative aspects of conducting an analytical sensory panel testing seaweeds together with consumers' understandings of the consumption context and existing practices. Having a professional background relating to food, the panelists are seen as expert consumers with a high willingness to try new foods and they are likely to become early adopters outside of the laboratory.

The aim of the study is to understand how expert consumers' everyday life practices and ideas about seaweed consumption resonate with sensory perceptions and experiences they have produced in a laboratory.

What kind of sensory perceptions and experiences are produced and how are they negotiated?

How do the professional tasters understand and relate to eating seaweed in their everyday life?

How do the sensory perceptions and experiences resonate with the experts' everyday habits?

Theoretically the study mainly draws on perspectives from the sociology of consumption and the concept of edibility.

Observations and open expert conversations during two training sessions and one testing day of an analytical sensory panel have been conducted. After the sensory testing of four different seaweed species, in-depth interviews with the professional panelists took place in the weeks after. The semi-structured interviews evolved around different parts of the food consumption cycle, such as acquisition of ingredients, cooking and eating.

Qualitative aspects of conducting the analytical sensory panel are analyzed, and everyday life practices and ideas of panelists about seaweed consumption are investigated. In a consolidating step, these findings will also be compared to the (elsewhere) reported results of the sensory testing.

By understanding the social processes that are involved in a novel food becoming edible, the findings might support establishing seaweed in a new market and aid a transition towards a more sustainable, plant-based diet. Furthermore, they might contribute to developing future consumer acceptance research by highlighting a qualitative methodology at the intersection between socio-cultural science and food science.

The study is currently ongoing. It is expected to identify possibilities relevant to better targeting early adopter consumers, based on understanding the expert consumers' perspectives on seaweed foods, and to show the fruitful interplay of interdisciplinary research in novel foods. Recommendations for practitioners will include for example consumer expectations towards seaweed as a cooking ingredient, accessibility, and classifications made by retailers as well as consumers. Recommendations for researchers will focus on the potential of an interdisciplinary approach to the acceptance of novel foods.

The decision of sense and sensibility: Consumer acceptance towards the names of cultured meat

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Naming and labeling products can profoundly affect consumer attitudes and subsequent behavior and particularly so in the case of new alternatives in the market. Cultured meat (CM) has entered the stage as a meat substitute, growing an animal's stem cells into muscle tissue in a lab environment (Post, 2012). Because CM is not yet available in the market except for Singapore (Singapore Food Agency, 2020), consumers are not familiar with this meat substitute. How we frame and introduce CM to consumers is crucial at this early stage of its development. Various names have been used to indicate CM, such as "clean meat", "lab meat", "synthetic meat", "in vitro meat", "artificial meat", and "cell-based meat". Previous research observed the difference in consumer acceptance based on the names of CM (Asioli et al., 2021; Bryant & Barnett, 2019). However, reasons behind this phenomenon have not been fully verified yet. The present paper explores the mechanism under the name effect by applying mediation analysis. Dual process theory posits two ways of consumers' information processing to form and utilize their attitudes in decision-making: heuristic processing and systematic processing (Fischer & Frewer, 2009). People with limited knowledge often perceive food technologies based on simple cues or heuristics (Siegrist & Hartmann, 2020a), among them naturalness and tastiness are keys heuristic attributes (Siegrist & Hartmann, 2020b). We postulate that name treatments have an indirect impact on consumer attitudes via perceived tastiness and naturalness. Under the rational systematic processing, consumers usually make food decisions on the provided information by inferring more considered expectations of benefits and risks. We, therefore, hypothesize that perceived benefits and risks of CM could mediate the name effect on attitudes. Moreover, a rising number of studies reported that an object's risk and benefit perception could be impacted by affective feelings, which is called "affect heuristics" (Finucane et al., 2000; Pachur et al., 2012). We proposed a third mediation pathway evoked heuristics (naturalness and tastiness) would influence perceived benefits and risks.

With a sample of 1532 Chinese consumers, we explored the underlying mechanism of the name effect for CM by using different terms ("cultured", "artificial", and "cell-based") to refer CM. To avoid confounding participants with the names of CM, we randomly assigned participants to three name treatment conditions at the beginning of the survey.

The mediation effect was tested using the PROCESS model by Hayes (2013), and the results are presented in Figure 1. Our results show that "artificial" is the more disliked term regarding perceived tastiness, naturalness, and personal and societal benefits. The name "cultured" meat is associated with higher benefit-risk efficiency than "artificial" and "cell-based" meat. Chinese consumers are more sensitive to benefit perception than risk perception. Results also indicate that consumers' attitudes depend on heuristic processing and affect heuristic processing but not systematic processing, highlighting the significance of expected tastiness and naturalness. Our findings provide implications for the global food industry in applying a name strategy for a new food product or technology and implications for introducing CM in China .

What are the determinants of consumption values and intention toward green food purchases? – Applying S-O-R and consumption value theories to understand factors affecting consumer choices

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The demand for green food has been growing among socially and environmentally conscious consumers. These consumers consider green food choices due to their interest in environmental protection, health, food safety, and quality of life. The literature on green marketing has indicated an important consumer emerging segment that prefers to buy green food over conventional products.

The study will examine consumer choices and why consumers adopt green food products. The theory of consumption value argues that consumers adopt products due to high perceived consumption values. Moreover, it is critical to explore factors that build positive perceived consumption values and attitudes. Study objectives are based on the relationships described in the stimulus organism and response (S-O-R) theory. Whereas the study included green food attributes are stimuli (S) that influence organisms such as attitude and perceived consumer value. The organism (O) is an internal cognitive state resulting from external cues that affect consumer response (R) such as an intention to purchase. SOR theory helps us to investigate perceived products characteristics and how they bring change within consumers' emotional or cognitive states. Whereas the consumption values assist us to explore the different aspects of perception that predict purchase intention.

Deriving from the theory, we have postulated four study objectives. (1) First, the study will examine the effects of perceived green food attributes (nutritional content, natural content, ecological welfare, sensory appeal, and price) on the organism (attitude, and perceived value), second (2), how these attributes are associated with two dimensions of attitude (Utilitarian and hedonic), third (3), which perceived consumer value (utilitarian, emotional, social, and conditional) determines specific attitude dimension, fourth (4), we aimed to explore do attitude and consumption values affect green food purchase intention (Response)? The study contribution is twofold. Compared to existing literature, the study explores the relationship between various perceived values and purchase intention mediated by two-dimensional attitudes. Furthermore, there is a limited understanding of determinants that facilitate positive consumer perceived value. Therefore, the study will measure the effect of green food attributes on consumption values.

The study is aimed to answer these research questions using a cross-sectional survey method. The data will be collected from residents of Budapest, Hungary. Responses will be recorded on a structured questionnaire. After data collection, the study will employ structured equation modeling to analyze the data, and results will be assessed in two stages-measurement and structural model. The findings of the study will be useful for marketers and scholars to understand consumers' psychological preferences for green food. The results will present critical product benefit that captures consumer attention.

Exploring the role of decision support systems in promoting healthier and more sustainable food shopping: a card sorting study

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The way in which stores are set up, due to the availability of products and the ease with which products can be found, has been shown to influence consumers' purchasing behavior. In an online choice environment such as a supermarket, digital decision support is commonly used to facilitate consumers' choice process. Such support systems are typically based on insights of consumer preferences, but there are increasingly calls to use support tools to encourage consumers to make healthier and more sustainable food choices. In developing and implementing such support systems, it is important to examine what is valued and needed from a social and technical perspective in an early development stage. The objective of this study is to identify opportunities and barriers in the development and implementation of decision support systems for healthier and more sustainable food shopping.

One-on-one semi-structured expert interviews (n=20) were held online with experts from United States, Hong Kong, and various countries in Europe, in the fields of behavioral sciences, digital marketing, decision aids, software development, persuasive technologies, and public health and sustainability (policy). Focus groups (n=4 groups, n=19 participants) were conducted with consumers who are used to shopping online. A card sorting task was used to understand expert and consumer participants perceptions. Participants got presented 17 cards in 5 different rounds, followed by semi-structured interview questions. Each of the 5 rounds addressed a different topic related to the decision support. Content analysis was carried out on the textual data and key themes for each card set were identified.

Findings show that decision support when shopping for food online is considered useful, particularly when suggestions are personalized, transparent, and justified (using labelling or informative text). Successful implementation was believed to be supported through 1) presenting suggestions early in the shopping trip in an easily visible but non-disruptive manner, 2) allowing autonomy to (not) provide personal data and choosing type of guidance (e.g., show sustainable alternatives but not healthier ones), and 3) educating consumers about healthiness or sustainability of food choices. In discussing support systems, experts focused mostly on effectiveness, while consumer participants emphasized low effort.

Hindering factors for both experts and consumer participants related to digital guidance being disruptive or steering, low perceived credibility and unclarity about what is healthy or sustainable. Consumer participants expressed concerns about too generic recommendations in relation to health and lack of knowledge about labelling. They emphasized that too much support and required effort (such as repeatedly providing data) would be unpleasant and burdensome. Experts also mentioned the risk of not having the required data to provide support (e.g., no up-to-date product information), a lack of consumer motivation to choose healthy or sustainable

(intention-behavior gap), and limited consumer interest in support. Results from this study provide insight into the potential effectiveness of digital interventions to encourage healthier and more sustainable choices and what this means for technical development.

F10: Transforming financial services to empower individuals toward sustainable consumption

Session Chair: Gracia Lanza

Room: B: Omnia, R: Momentum 1 (max. 30)

The session focuses on the question of how we can change individual consumption behavior. Building on Thøgersen (2021), the session will highlight that the focus should be on making climate-friendly behavior easy behavior, in terms of securing a correct reflection of carbon footprint in prices, climate-friendly products that compare favorably to unfriendly alternatives, and carbon labeling. Providing carbon footprints and user-friendly insights through financial institutions will not only close the gap between the consumer and the bank but will also facilitate understanding of the role and impact of individuals in the environment. It will discuss several key aspects relevant and related to the theme of sustainable consumption and lifestyles of the conference because people's spending reflects their lifestyle. According to Thøgersen (2021), most consumers cannot identify the behavior changes that are worth doing. Our goal with the session is to showcase that it is possible to promote sustainable consumption by linking the so-called climate currency to actual currencies. We seek to analyze individual consumption based on financial transactions to provide carbon emissions for said transactions and thereby create transparency about one's carbon footprint. We then seek to enable financial institutions to turn this knowledge into actionable content to communicate information that helps empower people to change their consumption behavior and reduce their carbon footprint.

There are many carbon calculators in the market, but they are not associated with transaction data and are not easily linked to the user. We seek to open a dialogue and debate about the stakeholders needed to achieve changes in consumption behavior successfully, the banks' perspective to reach individuals, and the need to standardize methodologies and processes to provide transparency and established trust. As mentioned above, ecolytiq, Rabobank, and Visa will share their experience and key factors for successful implementation.

Line-up of speakers:

David Lais, Co-founder, ecolytiq, david.lais@ecolytiq.com

Visa (TBD)

Berend Stofferis, Data Scientist, Rabo Carbon Bank, Berend.Stofferis@Rabobank.com

Pavel Gladkov, Head of Product, pavel.gladkov@ecolytiq.com

Gracia Lanza, product manager environmental research, gracia.castillo@ecolytiq.com - moderator

F11: Assessing the impact of structural change on sustainability transformations - a critical discussion

Session Chair: Doris Fuchs

Room: B: Omnia, R: Momentum 3 (max. 30)

Quantifying the impact of structural changes on sustainability transformations is one of the significant challenges faced by sustainable consumption-oriented research. Given that politicians (and the media) are more responsive to numbers and individual lifestyle change at the household level is much easier to quantify, it is extremely hard to make the case for the relevance of changes in economic, political, technological and societal structures in the political arena if we can't show the mileage that can be gained. And yet, structural change is what sustainability transformation requires, given knowledge-action and action-impact gaps and especially rebound effects.

It is extremely difficult to measure, let alone quantify, the impact of structural change, especially of deeper or more complex structures such as dominant societal norms/narratives or changes in political or economic institutions. While some forms of structural change can be quantified, like the rate of building renovations or changes the energy mix at the production level or in access to health care or education, the impact of other changes such as societal narratives about wellbeing, political campaigns or the abandonment of the growth paradigm defy an easy quantitative approach. Our dialogue/debate session for the joint ERSCP and SCORAI International Conference 'Transforming consumption-production systems toward just and sustainable futures' therefore proposes to critically reflect on the challenges of assessing the impact of structural change on sustainability transformations and explore ways forward. The panel will take the format of a discussion session, with all panelists starting by answering 3-4 jointly defined questions. Via the discussion, we then aim to work towards a typology of structures characterized by different possibilities and challenges of quantification. With more questions than answers, it is our hope that this session can serve as a platform for exchange, learning, and debate in this area of research.

The session brings together expertise from social scientists involved in sustainable consumption research, who share the aim of tackling the challenging question of assessing impacts of structural change. They come from the disciplines of geography, political science, sociology, and psychology and have gathered extensive experience in the context of international collaborative research projects, addressing the role of structures with respect to the sustainability of consumption in one way or another. The session will adopt a dialogue-debate session with short input statements by all panelists, addressing predefined questions, and a subsequent moderated debate among the panel as well as with the audience.

Line-up of speakers:

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F12: Exploring Sustainable Lifestyles Futures Scenarios: An Interactive Session

Session Chair: Vanessa Timmer

Room: B: Omnia, R: Spectrum (max. 30)

This interactive dialogue session explores 'hot off the press!' future scenarios of sustainable lifestyles. We are focused on the question: how can lifestyle changes accelerate deep climate mitigation by 2050?

Participants engage with a set of four comprehensive sustainable lifestyle scenario narratives. These narratives describe different alternative pathways in which lifestyle changes may unfold towards 2050. The scenarios were developed as part of the IMAGE Sustainable Lifestyles project led by Utrecht University with partners OneEarth Living, the Hot or Cool Institute and Strategic Design Scenarios (see project description below). The scenarios were developed as a way of supporting strategic dialogue and form the basis for model-based climate scenario analysis.

The four scenario narratives emerged from a set of multidisciplinary workshops with lifestyle change experts, scenario analysts and integrated assessment modellers. The narratives diverge along two critical uncertainties: focus on individual vs. communal values and the level of access to centralised vs. distributed support for the transition to sustainable lifestyles. The four scenario narratives are Designed World (structural support/individualistic values), Global Commons (structural support/collectivist values), Big Village (distributed support/collectivist values) and Pocket Lifestyles (distributed support/individualistic values). These scenario narratives present a richer understanding of the role that sustainable lifestyles could play in climate change mitigation. The scenario narratives emphasize the role of society, enablers, lifestyles and behaviours for systems change. They aim to influence decision-makers and changemakers focused on sustainable living.

About the IMAGE Sustainable Lifestyles (IMAGE SL) Project:

Global, model-based scenarios play a key role in exploring different strategies to mitigate climate change (e.g. via IPCC). At the moment, however, these scenarios hardly consider lifestyle change as a mitigation option. The few, stylized, calculations made show a considerable potential, based on options such as transport behavior, dietary patterns and use of appliances). This project brings together experts on (changing) consumer behavior, experts on global scenarios and stakeholders. This allowed the use of evidence-based information on the contribution of lifestyle interventions in the integrated assessment model IMAGE, to scale-up available information and to jointly develop mitigation scenarios.

The IMAGE SL project is led by Utrecht University Copernicus Institute for Sustainable Development, working together with existing researchers in the IMAGE research team and in consultation with the stakeholder community. Communications and engagement are a core part of this project. Two implementing partner organizations, OneEarth Living and the Hot or Cool Institute, bring their expertise in engaging decision-makers in ways that influence policy, action and impact. The project engages communications specialists from the outset in order to make the project insights and stories accessible for review and improvement and for use and testing in the field. The communication framing, messaging and outputs are co-developed with stakeholders and supported by foresight expert (Nicole-Anne Boyer – with OneEarth Living) and by participatory scenario / foresight designers and graphic design experts (Strategic Design Scenarios). We look forward to engaging SCORAI conference participants in dialogue about the sustainable lifestyle future scenarios.

Speakers, Session Designers & Facilitators:

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F13: Household Consumption and Decision-Making

Session Chair: Bas van Vliet

Room: B: Atlas, R: Atlas 1 (max. 80)

Individual, social and contextual factors contributing to behavioural lock-in in leisure air travel

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The emissions reductions necessary to reach the climate targets are not possible without behaviour change, which has the potential to reduce global emissions by 40-70% by 2050 (IPCC, 2022). This applies to a wide range of different sectors and industries, with air travel taking on a special role, accounting for 2.4% of global CO₂ emissions and having a three times as high total warming effect. The majority of flights stem from leisure travel (Doganis, 2013), with flying representing one of the most resource-intensive consumption choices an individual can make. At the same time, refraining from leisure air travel is more challenging than other climate-friendly behaviour changes (Barr and Prillwitz, 2012), because of prevalent behavioural carbon lock-in (Wood et al., 2012). In general, Seto et al. (2016) differentiate between three types of carbon lock in: technological/infrastructural, institutional and behavioural lock-in, which are the result of path dependencies. These three types of lock-in are mutually reinforcing and therefore relevant for individuals' air travel behaviour. Thus, the objective of our study is to gain better understanding of how they influence leisure air travel behaviour, and in this way to create a sound basis for policy decisions on the decarbonization of air traffic.

Therefore, we conducted a quota-representative survey (N = 1,000) in December 2022 among the Austrian adult population covering three main areas: (1) sociodemographic aspects, (2) leisure air travel behaviour, and (3) lock-in factors. The choice of explanatory variables is based on our conceptual framework which links the categories of carbon lock-in of Seto et al. (2016) and the Model of Justified Behaviour (MJB) of Hansmann and Binder (2021). Their effect on individuals' leisure air travel behaviour is estimated using Ordinary Least Squares (OLS) regression models.

The present study's contribution is both scientific and practical. It proposes the first operationalization and application of the three types of carbon lock-in, tailored to individuals' behavioural lock-in (in leisure air travel) and empirically tests this conceptual framework in a nationwide quota-representative survey, thus increasing the empirical evidence base in this field. Based on the results of the survey study, policy recommendations and strategies for escaping behavioural lock-in in leisure air travel can be proposed.

References

Barr, S. and J. Prillwitz (2012). Green travellers? Exploring the spatial context of sustainable mobility styles. *Applied Geography* 32 (2), 798–809. Num Pages: 12.

- Doganis, R. (2013). Flying off course: The economics of international airlines. Routledge.
- Hansmann, R. and C. R. Binder (2021). Reducing personal air-travel: Restrictions, options and the role of justifications. *Transportation Research Part D: Transport and Environment* 96, 102859. Num Pages: 16.
- IPCC (2022). *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK and New York, NY, USA: Cambridge University Press.
- Seto, K. C., S. J. Davis, R. B. Mitchell, E. C. Stokes, G. Unruh, and D. Urge Vorsatz (2016). Carbon Lock-In: Types, Causes, and Policy Implications. *Annual Review of Environment and Resources* 41 (1), 425–452. Num Pages: 31.
- Wood, F. R., A. Bows, and K. Anderson (2012). Policy Update: A one-way ticket to high carbon lock-in: the UK debate on aviation policy. *Carbon Management* 3 (6), 537–540. Num Pages: 5.

Toward sustainable home practices - The influence of non-human entities

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During prevailing environmental problems, it is essential to consider all emission sources of consumption and how emissions could be reduced. Housing produces a large part of the emissions produced by consumption (Ivanova et al., 2016). Practice theoretical approaches can shed light on the production of emissions at home that are mostly unnoticed by consumers and actualizes via mundane routines (Gram-Hanssen, 2011). Previous research shows that humans are not the only participating entities in performing home practices (Strengers, Nicholls and Maller, 2016). Nonetheless, the influence of non-humans on home practices is still poorly known, and more research is needed to support transformation of home practices toward sustainability. Our research interest in what kind of influence non-humans have on home practices and what kind of influence they have on the sustainability of these practices, is guided by a posthumanist practice theory. The posthumanist approach embraces a plurality of entities with agentic capacities (Coole, 2013). Posthumanist thinking seeks alternative, non-essentialist and non-hierarchical ways of understanding the qualities and mutual relationships of different entities (Lummaa and Rojola, 2016). In this study, we use qualitative methods. We answer these research questions by analyzing ethnographic interviews (n=30) and consumer diaries (n=25). According to the analysis, non-human entities can change practices, prevent practices from being performed and create new practices. How humans react to these changes and practices can determine the sustainability of practices. Non-human entities are also different from each other and in different positions because weather and climate create circumstances in which other non-humans and humans are and live. This research contributes to the literature on home practices by providing new information about their dynamics. That is, the results increase understanding of the different roles of the various entities participating in home practices. The research also deepens the understanding of limits of the sustainability of home practices.

References:

- Coole, D. (2013) 'Agentic capacities and capacious historical materialism: Thinking with new materialism in the political sciences', *Millennium: Journal of International Studies*, 41(3), pp. 451-469.
- Gram-Hanssen, K. (2011) 'Understanding change and continuity in residential energy consumption', *Journal of Consumer Culture*, 11(1), pp. 61-78.
- Ivanova, D., Stadler, K., Steen-Olsen, K., Wood, R., Vita, G., Tukker, A. and Hertwich, E.G. (2016) 'Environmental Impact Assessment of Household Consumption', *Journal of Industrial Ecology*, 20, pp. 526-536.
- Lummaa, K. and Rojola, L. (2016) 'Johdanto: Mitä posthumanismi on?' in Lummaa, K. and Rojola, L. (eds) *Posthumanismi*. Turku: Eetos, pp. 13-32.
- Strengers, Y., Nicholls, L. and Maller, C. (2016) 'Curious energy consumers: Humans and nonhumans in assemblages of household practice', *Journal of Consumer Culture*, 16(3), pp. 761-780.

Current and projected household carbon footprints of the European Union and selected G20 countries in 2030 and 2050

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Scenarios that limit global warming to 1.5°C rely on a combination of mitigation options to meet emissions reduction targets. The most ambitious emissions reduction pathways include widespread technological change, such as the adoption of renewable energy, deployment of carbon capture and storage and overall efficiency improvements across economic sectors. The share of climate change mitigation necessary from technological or behavioural change has generally been studied from a static perspective and thus does not account for how the need for mitigation from behavioural change evolves following possible economic and technological developments.

This study adapts a global supply and use table framework from EXIOBASE 3 in line with existing climate change scenarios to create scenario models of how consumption-based footprints will evolve by 2030 and 2050. The exogenous changes applied for each scenario are the basic elements from Shared Socio-Economic Pathway 1 (SSP1) and technical changes consistent with lower levels of anthropogenic forcing as modelled by the integrated assessment model IMAGE. Direct and second-order adjustments from balancing are implemented consecutively for changes to population, gross domestic product, economic structure, total factor productivity, electricity generation mix, electrification and biofuel uptake in the transportation sector, fuel shifts for space heating and manufacturing sectors, and adoption of carbon capture and storage by industry. Changes conceivably linked to behaviour change, such as household adoption of electric vehicles, are excluded to isolate the effects of technological shifts. After converting the adapted supply and use tables to a multi-regional input-output model, shifts in household final demand expenditure from increasing wealth are modelled by adjusting final demand spending following spending portfolios derived from household budget surveys. The resulting scenario models are used to assess the extent that technological change alone can mitigate greenhouse gas emissions in a selection of 30 countries, comprised of the EU27 and three G20 countries (Indonesia, Mexico, and South Africa).

In this study, we calculate the remaining mitigation necessary from lifestyle changes (or negative emissions technologies) even with extensive technological transformation. Our results indicate that no countries are projected to meet a median 1.5°C-compatible target distributed equally across the global population. The only countries possibly remaining on a 1.5°C trajectory in 2030 are Croatia and Indonesia. The largest drivers of emissions changes include changes in total factor productivity, gross domestic product, the electricity generation mix and carbon capture and storage uptake. Our results contribute to the growing literature demonstrating the importance of individual behaviour change in climate change mitigation. Further research can quantify the amount of behaviour change options needed to stay within the aspirational 1.5°C target proposed in the Paris Agreement.

A Study on the Carbon Neutrality Policy in the Household Sector: Using the Results of Focus Group Interviews

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Japan's target for greenhouse gas emissions reduction in the household sector is a 66% reduction from the 2013 level. The following policies are being implemented in the household sector for this target.

- (1) Energy conservation in home appliances (promoting the replacement of inefficient appliances),
- (2) Electrification of fossil fuel appliances (replacement with air conditioners and other appliances),
- (3) Improving home insulation (promoting insulation of housing); and
- (4) Transformation of mobility (promoting public transportation and replacing private cars with EVs and HVs).

To further promote these policies, we considered it necessary to understand how consumers respond to them.

We conducted focus group interviews(FGI) with Tokyo area residents in late November 2022. Interviews were conducted with four groups of (detached and apartment buildings) x (male and female) for 2 hours each.

Before the interview, participants were asked about their home appliances, car ownership, and housing and family structure. Based on the pre-interview responses in the FGI, the moderator asked about the most recently purchased home appliance or home equipment and the purchase process. The respondents were asked to identify to what extent energy conservation and the environment were essential to their strategy. Next, the participants were asked about their knowledge retention and attitudes toward climate change. Then, a lecture about the current situation and response to climate change and a Q&A session followed. Finally, the effectiveness of the lectures on climate change and livelihoods was confirmed.

The results yielded the following findings.

A) The two male Groups and one women group tended not to consider the seriousness of the climate change problem and the need to address it as an ""own personal matter.""

B) There was no consistent tendency in perceptions and attitudes toward climate change and the choice of energy-efficient home appliances and equipment, suggesting that there are limitations to policies that are key to raising environmental awareness.

C) Many participants indicated that the explanations given by sales staff at home appliance stores and by personnel at construction companies during house construction were critical factors in their decisions on energy-saving appliances and equipment, indicating that these promotional activities were highly effective. At the same time, price comparison sites were also referenced, especially by males.

D) Lectures were given by male lecturers (two authors). There was no change in self-rated comprehension among males, while it improved among females.

Many participants cited the involvement of both husband and wife in decision-making about home appliances and home equipment. However, there were significant differences between

men's and women's attitudes toward climate change, which were also evident in their different responses to the lecture content. Making climate change a personal issue for men is a significant challenge, and strengthening women's attitudes toward energy issues is also challenging.

Understanding the potential of sustainable consumption in the growing cities of developing Countries: A case of Bheemdatt Municipality, Western Nepal

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People in the developing countries struggle to meet their basic needs. Environment friendly behaviour and practices are far from practical to majority of those who suffer the most from climate change impacts. Promoting the concept of sustainable consumption at household level is therefore, challenging and complicated. This study was conducted to explore the household consumption pattern in urban and peri-urban settlements in Bheemdatt Municipality of Western Nepal. Consumption pattern in food, means of transportation and use of public parks were considered for this study. The study answered three questions: (i) is there any difference between the urban and peri-urban settlements regarding their consumption pattern? (ii) what are the factors affecting the consumption behaviour of the citizens; and (iii) what are consumers' preference to pay for green food products and services. Household survey from 271 households were conducted applying simple random sampling technique, followed by focus group discussion, key informant interviews and experts' consultation. The information collected were then analysed using SPSS software and excel. Review of literature of 80 relevant peer-reviewed journal articles was conducted to substantiate the findings.

We principally applied Theory of sustainable Consumption for this study, where the other associated theories namely Value-Belief-Norm Theory; Practice Theory, and ecological modernisation theory were considered relevant to derive the conclusion. Our findings through Chi-square test shows that the consumption behaviour of citizens living in urban and peri-urban does not differ significantly as they are much dependent on each other for resources, services, and supplies. Age, education level, economic status, knowledge, association with community level networks/groups were found to be the influencing factors towards the way people consumed in general. While more than 70% of the respondents reported that they knew about the concept of green products, only 41% expressed their preference to pay the premium price. This again depended upon the subsidy they would receive, and the quality guarantee provided by the local government. The peer-pressure and institutional mechanism in the study area was found quite influential in terms of promoting sustainable consumption behaviour. For instance, the local government had passed a special Act passed on the use of electric scooter, use of the same was found popular; but not for the environmental purpose rather for the economic and social purpose. While many of the available legislative frameworks of the local government talk about the conservation of nature, they remain silent about their linkage to citizen's lifestyle and daily consumption behaviour is untouched.

We conclude that the concept of sustainable consumption is still new and unknown to majority of citizens as well as the local government in Bheemdatt Municipality. The findings from this study will be much relevant to the local government in terms of planning and executing appropriate policies and programmes to promote sustainable consumption. The findings can also be applied by urban planners and private sector to influence sustainable production system. It has also

contributed to the existing literature on sustainable consumption in regions of growing economies.

F14: Co-Design and Social Learning in Sustainable Consumption and Production: Case Studies (2/2)

Session Chair: Jānis Brizga

Room: B: Omnia, R: Momentum 2 (max. 30)

Paving the way for sustainable consumption and production patterns through research of a European University Alliance

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Presenter: Volkmar Kircher, volkmar.kircher@unileoben.ac.at (in person)

On 25 September 2015 the United Nations General Assembly adopted a resolution with the aim to protect our world from degradation and to transform it to a home for peaceful, just, prosperous, and inclusive societies without poverty or hunger. As a result, the UN defined 17 Sustainable Development Goals (SDGs) with 169 targets.

The question arose as to how a Higher Education Institution (HEI) could make an effective contribution to the SDGs. For this reason, seven partner universities selected the Sustainable Development Goal 12 as a central theme in order to pioneer the way for sustainable consumption and production patterns and launched the European University on Responsible Consumption and Production (EURECA-PRO) with the support of the European Commission under the Erasmus+ programme. The consortium expanded by two more partners and as of January 2023, the consortium consists of 9 HEIs from 8 countries with about 120.000 students, 110 departments and 18.000 staff, with a common approach to higher education and research issues around SDG 12.

The creation of new interdisciplinary degrees with integrated mobility opportunities across all three study cycles, will lead to joint European degrees, increased student and staff mobility, it promotes integration, multilingualism and European identity. The long-term vision of EURECA-PRO is to be the European educational hub and leader in interdisciplinary research and innovation in sustainable consumption and production of resources, goods and materials by 2040. This will include technological, ecological, political, economic and societal aspects and their transfer into society and industry to achieve the targeted CO₂ reduction and sustainability practices associated with the EU Green Deal by 2050.

To achieve the ambitious goals, both high-quality education and cutting-edge research must be pursued. This practitioners' contribution focuses on the research dimension of EURECA-PRO and shows how the European University strategically plans to pave the way for sustainable consumption and production patterns through research, and discusses the research-related activities carried out so far.

In order to screen the strengths and limitations of the partners, a EURECA-PRO research inventory of SDG12 projects resulted in 488 research projects covering 805 SDG12 research topics. The information was used to create the following 5 Research Lighthouse Missions (LHs) that focus on SDG12, taking into account Circular Economy, EU Green Deal and Planetary Boundaries: LH1 Responsible Material Flows, LH2 Environment and Water, LH3 Sustainable Materials and Products, LH4 Clean Energy, and LH5 Process automation and Industry 4.0. Research groups with scientists from all partner universities have been formed for each LH, lead universities have been installed and interdisciplinary cutting-edge research projects are being carried out. Interuniversity teams work on joint publications, the establishment of a joint Open Access Policy and Research Lighthouse Mission -related events, such as the annual EURECA-PRO conference, PhD Journeys and Summer Schools, supplement the research portfolio. To raise awareness of the urgent need for transformative social change among citizens and industry, Citizen Science events are held alongside the research efforts.

Governance for sustainability-oriented knowledge transfer? A contrasting case study on two knowledge transfer projects transitioning sustainable consumption and production

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This paper explores the role of academic knowledge transfer models for sustainability-oriented innovation (SOI) in sustainable entrepreneurial ecosystems. As central actors, companies need support with integrating external knowledge sources to fight, mitigate and solve so-called “wicked” problems of sustainability. Literature has intensively discussed the relevance of university for knowledge production. Particularly, contextual and regional conditions of entrepreneurial ecosystems influence the upcoming and diffusion of SOI. It is still not clear how the directionality of knowledge transfer influence universities role as boundary spanner and knowledge broker? Moreover, which institutions influence functioning of entrepreneurial ecosystems for an effective and efficient knowledge transfer for SOI? In a case study on the role of two German universities in entrepreneurial ecosystems, I conducted 32 expert interviews. One university applied an explicit focus on SOI in their knowledge transfer activities, while the other university aims to support the general regional innovativeness level. As my analysis shows, knowledge transfer with focus on SOI shows characteristics of a club good fostering transformative processes with exclusive access to sustainability-oriented knowledge. Furthermore, sustainable knowledge transfer has been described as being shaped by network-building inside universities, boundary spanning into the local entrepreneurial ecosystem and the dynamic development of knowledge networks.

Building a university alliance for responsible consumption and production: Challenges and opportunities.

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EURECA-PRO is a European University alliance with a focus on implementing Sustainable Development Goal 12 (Responsible Consumption and Production). The alliance's shared, long-term vision and mission for 2040 is to holistically contribute to society's transition toward sustainable consumption-production systems and to promote the transformation of the European Higher Education Area. This European University initiative is made up of an alliance of nine universities which represent different parts of Europe: Spain, France, Belgium, Germany, Austria, Greece, Poland and Romania. Six of these universities are technical universities, and three are comprehensive universities with a broader study and research program.

The authors of this practitioners' contribution take a critical look at how the process of working towards responsible consumption and production in teaching, research, innovation and societal outreach has unfolded in EURECA-PRO. One particular challenge lies in the management of international and cross-disciplinary collaboration in the areas of research, teaching and innovation. On the road towards responsible consumption and production, it is important to acknowledge current institutional, structural and behavioural obstacles and challenges as well as to build on the opportunities created by inter-university, interdisciplinary and multi-level collaboration.

The issues at hand are discussed based upon an analysis of the materials produced in the process of shaping EURECA-PRO. These materials range from the project proposal text over deliverables handed in to the European Commission to surveys and interviews with key persons in the project.

An interpretative analysis of these materials and data will bring out recurring themes and their classification as opportunities or obstacles. This open-ended process will also allow for further issues to surface, which might concern aspects of the initiative that have been neglected so far. All in all, the paper will allow for critical insights into the workings of teaching, research, and outreach in the EURECA-PRO university alliance for responsible consumption and production. The two focal points are (1) the challenges and opportunities encountered by the alliance in interdisciplinary and inter-university collaboration and (2) the thematic challenges of working towards Sustainable Development Goal 12.

Increasing the effectiveness of official development assistance for climate change adaptation and mitigation: Investigating local stakeholder dialogues for the transition to sustainable energy consumption and production in Vietnam.

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Vietnam is at the forefront of environmental, social and health disasters caused by climate change. However, the means available to the State to protect its population, territories and resources are far from sufficient. Official development assistance (ODA), the financing aids provided by developed countries to low and lower middle-income countries, could be instrumental in supporting the country in its efforts to achieve Sustainable Development Goals (SDGs). However, the effectiveness of the ODA in addressing climate issues remains to be proven, as it has been criticized for its mixed results and for contributing to the development of asymmetrical relationships between donors and recipients.

This study investigates the Support Program to Response to Climate Change (SP-RCC) initiated by six bilateral and multilateral ODA providers since 2009 to support Vietnam in its formulation and implementation of climate change adaptation policies. Based on stakeholder theory, the hypothesis put forward by this research is that improving the effectiveness of the ODA hinges upon the degree of the integration of the needs among local stakeholders in the funded projects. Therefore, the process of developing policies for the transition to sustainable energy consumption and production (SCP) must consider the needs of local stakeholders, their perceptions of environmental change and involve them in the decision-making process for the program to be effective.

In order to examine the SP-RCC carried out by the different ODA donors, this study conducts a series of interviews with the stakeholders involved in the implementation of this program. The study underlines the acceptable outcomes of the program with respect to policy development for adaptation and mitigation to climate change, in particular thanks to effective cooperation between bilateral donors (States and their development agencies), multilateral donors (international organizations) and several key ministries under the Vietnamese government. The results of this study indicate, however, that there is great room for improvement in the policy dialogues with local stakeholders and governments. Various aspects of the SDGs need to be addressed and examined in the dialogues among them for the effective implementation of public policies and/or infrastructure supported by the ODA. Therefore, in a context where ODA is recognized as a leverage for financing sustainable development, the results of this study can serve as recommendations for public development agencies to strengthen the effectiveness of their interventions by making a more systematic use of consultations with local stakeholders in the design of ODA projects by holistically considering and integrating various issues and aspects of the SDG.

G: Friday, July 7, 15.45-17.00

G01: From A-Growth to Degrowth – Contesting growth narratives in Circular Transitions

Session Chair: Melanie Jaeger-Erben

Room: B: Omnia, R: Auditorium (max. 108)

Terms such as Circular Economy (CE) and Circular Society (CS) are associated with ideas of sustainable consumption and production systems in which not only the distribution and mobility of resources and products, but also knowledge, means of production and opportunities for participation are organized in sustainable, fair and democratic cycles and networks.

A key feature is the multiparadigmatic anchoring of research and development activities on Circular Economy and Society, which are umbrella concepts that refer to such diverse concepts as Industrial Ecology, Biomimicry, Cradle-to-Cradle, Ecojustice or Performance Economy. Their multi-paradigmatic anchoring and breadth has meant, among other things, that the Circular Economy/Society idea is highly connectable to different disciplinary approaches, groups of actors, and conceptual and normative perspectives on society and social change. This charges the concept with a large set of diverging expectations and promises, whereby the CE/CS is no longer "only" a model of restructured production-consumption contexts, but inherently becomes a com-prehensive project of socio-economic-and industrial transformation. In fact, any Circular Economy/Society discourse or proposal will carry divergent ideas and as-sumptions regarding social relations, conceptions of nature, visions of progress and technology etc. In this regard, a crucial line of conflict, so far mainly named but still little addressed, unfolds at the question whether circular transitions should be shaped as a project of ecological modernization or a systemic socio-ecological transformation. Crucially this entails questioning what role hitherto dominant narratives play in these perspectives such as ideas on economic growth, modernity, productivism, capitalist property relations, anthropocentrism, western ethnocentrism and neoliberal market logics etc.

The session presents and discusses different perspectives on growth and critically addresses the question of how Circular Transitions can be shaped in times of secular stagnation, fragile financial systems and increasing economic disparities.

Central questions are: Should Circular Economy/Society concepts and understandings question economic growth? What understandings of growth can best foster a sustainable, fair and democratic CE/CS transition? What does that mean for our understanding of the role of markets, businesses, industries in a CE/CS transition? What does this mean for our understanding of the role of governments in a CE/CS transition? What does this mean for citizens and civil society organisations in a CE/CS transition? Is the notion of Circular Economy or of Circular Society or another concept (e.g. degrowth, doughnut economics, buen vivir etc.) better suited to foster a desirable transformation?

Line-up of speakers:

Melanie Jaeger-Erben, Brandenburg University of Technology, melanie.jaeger-erben@b-tu.de

Martin Calisto Esquetini-Friant, p.m.calisto@uu.nl, Utrecht University,

Manisha Anantharaman, ma20@stmarys-ca.edu, Chatham House, Royal Institute for International Affairs

Florian Hofmann, Brandenburg University of Technology, florian.hofmann@b-tu.de

G02: Diversity in Agricultural Production Systems

Session Chair: Sanneke Kloppenburg

Room: B: Omnia, R: Quantum 1 (max. 30)

Transitions to sustainability in the seed sector: the niche of open-source seeds?

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Anabel Marin, Cluster Leader Business, Markets and the State, Institute of Development Studies, Brighton, England, A.Marin@ids.ac.uk

Presenter: Almendra Cremaschi, acremaschi@unsam.edu.ar (in person)

In the context of the wicked sustainability challenges the world is facing, there is a need to understand how to support radical change towards a more sustainable agrifood system. Within that system, seeds play a strategic role. They are the original input for agriculture, a bank of genetic information, and a source of agrobiodiversity and ancestral knowledge.

Currently, the seed system faces various challenges related to the massive concentration of the global and regional markets. The consequences of this process include loss of biocultural diversity, high seed prices, difficulties in accessing appropriate seeds for sustainable agricultural models, and dependence on external inputs.

One of the responses to these challenges is the open-source seed movement. Inspired by the ideas of open software, several initiatives worldwide are experimenting with legal tools to make plant genetic material available and accessible. The recently formed Global Coalition of Open-Source Seed Initiatives (GOSSI) seeks to create an enabling learning, networking, and advocacy space between them. This work is interested in understanding the role of this movement in transformations to more sustainable seed systems based on concepts and ideas from transition research.

Socio-technical transitions literature provides valuable insights to understand this role because it looks at processes of radical change towards more sustainable systems based on socio-technical innovations developed in niches. Niches are learning spaces where multiple stakeholders experiment outside dominant structures with innovations that could potentially address the problems of current production regimes.

We are interested in understanding to which extent the emergent global open-source movement articulated in GOSSI can be considered a significant contribution to developing a niche for the seed system.

We would argue that GOSSI has some elements of a niche at this stage of development. First, the existence of experiments in different contexts and second, their articulation in a global network, which creates the space for mutual learning. However, although the open-source seeds movement shows the bases for a niche-building process, there is still a road to travel to constitute a niche and eventually support a transition process.

Based on the analysis of the movement from the ideas of transitions studies, we propose three complementary action lines to move forward on the niche-building process 1) broadening the pathways of action out, complementing the licenses as social innovations with more technical ones, as participatory plant breeding 2) discussing the harmonization and articulation of both expectations and tools of the diverse experiments that are part of GOSSI 3) finding strategies to

broaden and strengthen its networks, finding mechanisms to generate a greater sense of ownership.

The presentation concludes that while open-source seeds initiatives are already connected, there is still much work to do if they aim to consolidate the open-source seeds movement as a niche. However, linked to the internal and external pressures in the current seed regime, we find stimulative windows of opportunity for it to grow.

The lack of diversity in plant species mobilized by household food acquisition in Brazil: a focus on ultra-processed foods and beef

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Presenter: Fernanda Leite, fernandahml@gmail.com (online)

Introduction: Agrobiodiversity is key for supporting and diversifying agroecosystems, promoting healthy diets and moving towards more sustainable food systems. Conversely, monocultures and homogenous diets threaten the diversity of species available for human food, particularly those of plant origin.

Aim: This study aimed to investigate the impact of high and low patterns of ultra-processed food and beef acquisition by Brazilian households on the diversity of mobilized plant species.

Methods: The 2017-18 National Household Budget Survey data analysed in this study comprised of records of seven consecutive days of all foods and drinks purchased for home consumption. Household aggregates (n=575) were used as the analysis unit. The total amount of foods (kilograms) and beverages (litres) purchased per person per year was calculated. Next, food items were classified according to the Nova classification system into four groups: 1) unprocessed or minimally processed foods, 2) processed culinary ingredients, 3) processed foods, 4) ultra-processed foods. Food items classified as Nova groups 1 and 2 were directly identified at the species level by using taxonomical classification from four datasources.

Ingredient lists from the UNC/IDEC/NUPENS national food label database were used to determine the composition of processed and ultra-processed foods. The percent composition of the ingredients was estimated and classified at the species level. The total amount of animal-sourced foods acquired by households were proportionally converted into the plant species utilised as feed inputs in their production. The Shannon diversity index was used to assess the diversity of plant species. Adjusted linear regression models were used to assess the association between acquisition patterns of high vs low quintiles of ultra-processed foods and of beef and the overall Shannon index of the plant species mobilized through Brazilian diets.

Findings: Only six species (brachiaria, maize, soybean, rice, sugarcane and wheat) accounted for more than 90% of the total amount of plant species mobilized by Brazilian household through their food purchases. This was reflected by a low average value of the Shannon index (which could range from 0=no diversity to 5.46=maximum diversity, i.e. if all the 235 mobilized plant species were evenly distributed) for the Brazilian population (H=0.87; 95%CI 0.85; 0.88), indicating low diversity. Household food acquisition patterns with the highest share of UPFs and

of beef (Q5) were associated with lower diversity of plant species mobilized. The Shannon index decreased by half when moving from a scenario with the lowest share of both UPFs and beef ($H=1.22$) to total food acquisition to a scenario with the highest share of both food groups ($H=0.62$).

Conclusions: Our findings demonstrate a low diversity of plant species mobilized by Brazilian households through their food purchases in 2017-18. Ultra-processed foods and beef played a key role in driving the low diversity of plant species that underlie Brazilian diets.

Cutting jobs with molecular scissors – understanding labor implications of CRISPR

Koen Beumer, Utrecht University, Utrecht, the Netherlands, k.beumer@uu.nl

Presenter: Koen Beumer, k.beumer@uu.nl (in person)

This paper focuses on the labor implications of crop gene editing applications for sustainable agriculture. Gene editing technologies like CRISPR/Cas (also known as 'molecular scissors', hence the title) allow genetic material to be altered in ways that are promised to be faster, cheaper, and more precise than existing technologies. This offers new opportunities for sustainable agriculture, for example by aiding the development of crops that are drought-resistant or require less chemical inputs.

Crop gene editing may have various other implications for sustainability, however. Scholars have pointed out a wide range of ethical and societal implications for issues such as human health, biodiversity, and ownership (Jasanoff et al. 2015; Nuffield 2016). Labour implications are entirely absent from these discussions. This is remarkable since there are concrete indications that gene editing may have uneven distributional consequences in terms of labor, for example by enabling crops to be modified to make them more suitable for automated harvesting or to make labor-intensive processes of hand pollination redundant (Scorza 2015; Xiong et al. 2015).

This paper seeks to elucidate potential labor implications and explain how particular practices of valuation in agrobiotechnology research make such labor implications invisible. As I will show, the common emphasis on yield maximalization, efficiency, and cost reduction (in the face of climate change) that underpin the configuration of technoscience and capitalism in agrobiotechnology, effectively hides detrimental labor implications from view.

By drawing on literature on labor-displacing technological change and food systems governance (Autor, 2015), this paper makes two contributions. First, this paper systematically maps the agricultural labor implications of crop gene editing. For this we have conducted a systematic analysis of crop gene editing literature and conducted 30 qualitative interviews with systematically selected gene editing experts. Second, based on these findings, the paper offers a novel conceptualization of the various possible agricultural labor implications of gene editing, so as to render them visible and open up alternative futures for the application of gene editing for sustainability.

G03: Developing and Managing Sustainable Businesses: Tools and Practices

Session Chair: Leslie King

Room: B: Omnia, R: Quantum 4 (max. 30)

Implementing sustainability and operational excellence in corporations: development and refinement of a conceptual strategy deployment framework

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Presenter: Katharina Roche, katharina.roche@uni-graz.at (in person)

Even though operations management is critical from a sustainability perspective, research has yet to identify how far social and environmental objectives are incorporated into its various aspects. This is a major challenge for companies as they have to handle business requirements in a short time frame and at the same time have to establish, or sustain, a suitable organizational culture, leadership skills and operational excellence – all of which are necessary to be successful in the long term. However, there is often a gap between strategy development and its implementation, where short term business goals are prioritized over long term investments in a company's culture, workforce development, sustainability, and innovation. Sustainable operations management is, hence, in search for models that integrate operational excellence with sustainability.

This research aims to provide a strategy deployment framework integrating operational excellence and sustainability. For this aim, existing frameworks have been applied. Among operations management systems hoshin kanri, a special form of strategy deployment, addresses key characteristics for operational excellence, including lean principles as well as economic (e.g., performance improvements through goal alignment), environmental (e.g., to eliminate waste) as well as social aspects (e.g., involving all employees and levels of decision making). The Framework for Strategic Sustainable Development was chosen as the framework for sustainability to be combined with hoshin kanri. This framework was applied due to its practicality, its clearly defined sustainability principles, and planning process as well as combination possibilities with other management methods and tools.

The research approach includes an explorative literature review, which identifies key principles for both operational excellence and sustainability and serves as a foundation for the development of a framework towards linking operational excellence with sustainability. To this end, this study uses existing, holistic frameworks for both operational excellence as well as sustainability as a basis and examines ways to adapt them for a potential framework for strategy deployment linking operational excellence with sustainability. For framework refinement the case study approach was chosen. Here, an SME from the Austrian food logistics sector, in which hoshin kanri has been implemented since 2020, was investigated in detail concerning its hoshin kanri implementation and key characteristics of the strategy deployment process. Here, data

was collected within all levels of the company, through observations, workshops, as well as interviews, analyzed using qualitative content analysis and in an abductive mode. Main findings of the research are a framework linking operational excellence with sustainability through hoshin kanri. Further, specific aspects necessary for successful implementation in practice of hoshin kanri were identified. Here, the framework was adjusted and extended including additional factors for successful implementation. By properly aligning strategic sustainability goals within the whole organization, operations will be able to actively help achieve these goals in practice. Hence, the research contributes towards supporting corporations in their efforts in becoming sustainable businesses. Further contributions are the identification of possible links between operational excellence and sustainability. The findings may serve as a base for future research that will include testing and validating the framework.

Navigating Environmental Sustainability in the Corporate Sector

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Presenter: Leslie King, lesking@smith.edu (in person)

The field of corporate environmental sustainability is booming, as scientific evidence of climate warming and loss of biodiversity continues to mount and as investors and governments apply pressure on companies to address their environmental footprints. Yet companies typically exist to maximize profit and, under our current economic system, must grow – by continually producing more and selling more. How do those working in corporate environmental sustainability handle tensions between the profit imperative and sustainability efforts? Using a modified grounded theory approach, we explore how those working in corporate environmental sustainability think about and enact their jobs. Our research offers qualitative insights into how employees navigate tensions between their own individual concerns and ideals regarding environmental sustainability and corporate structures that shape their work.

Our analysis draws on 24 depth interviews that lasted between 45 minutes and an hour. Though a few participants were recruited via our own personal networks, most were recruited through email solicitations that drew from Fortune 500 lists and from lists of companies that sent representatives to COP 26.

We identify three main orientations of those working in corporate environmental sustainability. First, some – mostly longer-term employees who have chosen to move from other corporate positions into environmental sustainability – fully believe that the corporate world can and must “lead the charge” toward greater environmental sustainability. Those in this category express a belief that profit need not conflict with environmental protection. A second orientation - held by a few interview participants who had “fallen into” environmental sustainability positions - is to approach the work in a pragmatic and limited way. Those in this (our smallest) group appear only moderately concerned about environmental sustainability and are more or less “just doing their jobs.” Finally, some sustainability coordinators/advisors, many of them younger employees who were trained in sustainable development or various types of environmental studies, struggle to align their personal ideals with their work inside corporate structures. For this last group, there is a serious tension between what they would like to do as individuals and what they are able (or not able) to do as corporate employees.

All of those working in corporate environmental sustainability face similar constraints: the pressure for growth and profit and the hierarchical and bureaucratic nature of big firms, which can slow and often impede forward motion. Together, these hinder environmental sustainability projects (which occasionally can contribute to the bottom line but which often have upfront costs). Our preliminary findings suggest that those with more academic knowledge about environmental sustainability are more pessimistic about the impact of corporate environmental sustainability projects, while those with longstanding corporate backgrounds remain more optimistic. Concretely, almost all of the respondents indicated that investor pressure has led to increased reporting on environmental sustainability. While clearly an important step, our data suggests that this reporting is time-consuming and may not lead quickly enough to the actual changes necessary to forestall the looming planetary crisis. Most of our respondents believe that government policy is crucial in instigating corporate sustainable practices.

Hospital sustainability indicators and actions – a systematic literature review and framework

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The climate crisis is increasingly linked with natural disasters, spread of infections, and political conflicts, and poses a threat to both physical and mental health. Consequently, evermore people will require professional medical treatment to sustain their life quality. However, ironically, health care facilities contribute enormously to global warming and the destruction of natural ecosystems, as the healthcare sector is responsible for about 4.4 % of GHG emissions worldwide, and even 5.2 % in Germany. Hospitals thus must become more sustainable in order to pursue their principal task – to provide and sustain health. This work presents a structured literature review of (a) recommended, implemented, or planned sustainability actions (i.e., measures taken beyond legal requirements) in hospitals worldwide and (b) proposed indicators to assess a hospital's sustainability performance and the efficacy of aforementioned actions – environmentally, socially, and economically. In detail, we aim at identifying methodological or thematic gaps in existing assessment frameworks, and at illustrating the interaction between sustainability actions and indicators: which measures need to be taken to improve specific indicator results, and which indicators can adequately measure the effects of actions taken? We develop a framework for an integrated sustainability assessment and compile a pool of indicators and actions that is structured in a four-level hierarchy: (1) sustainability dimensions, (2) categories that represent different areas and issues in a hospital setting, (3) groups of indicators and actions that pursue the same target, and (4) individual actions and indicators. This approach allows for matching indicators and actions, and identifying inconsistencies between them, as well as for deriving high-priority core indicators and actions that are deemed indispensable for measuring and improving the sustainability performance of hospitals. Key results show that, first and foremost, taxonomies and terminologies are widely heterogeneous. Second, existing assessments are widely inconsistent in their selection of indicators. Third, we unveil gaps and show that certain areas are methodologically or thematically under-represented in current research and practice – e.g., social responsibility, food provision, medical activities, or procurement. Lastly, we derive core indicators and actions for all sustainability dimensions. Our framework can serve as a novel guideline for indicator-based sustainability assessments and action-based improvement of hospitals' sustainability performance. The framework aims at academia and practitioners alike and could potentially be transferred to other industries. Future research should further focus on the prioritization of indicators and actions for specific hospital settings, as well as on eliminating internal or political barriers for enhancing the sustainability performance.

Overcoming barriers for integrating sustainability in SME's

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Organisations that want to take steps towards sustainability are confronted with a proliferation of websites, tools and trainings. The abundance of information and its complexity is paralyzing. Especially small and medium-sized companies cannot see the wood for the trees. Their smaller scale and limited time, budget and expertise, create specific challenges. Since SMEs are an important employer (in Belgium, SMEs employed a total of 1,755,380 employees in 2021), there is a huge potential for a sustainability wave within SMEs in face of reaching climate and other sustainability goals.

We present two projects that address the need of SMEs to obtain clear-cut, hands-on advice on sustainability. In the first project, we help SMEs find a tool that can assist them in developing their sustainability policy, their sustainability reporting and sustainability communications. We conducted an in-depth comparison of four sustainability tools: The B Corp Impact Assessment, the Economy for Common Good Matrix, the Future Fit Business Benchmark and the Sustatool. We developed a typology of SMEs to match them with one of the tools according to their needs. From this comparison we experienced that the four tools in different ways still present significant barriers for SMEs to take steps in their journey towards sustainability. Specifically, most tools have a strong focus on sustainability reporting, which is often too ambitious for SMEs, especially for those that barely have a sustainability policy in place. Therefore, in our second project, we are building a new tool focused on taking action. In addition, the new tool will avoid the typical information overload and jargon that SMEs encounter in existing tools.

Our new tool enables SMEs to become more sustainable in two ways: First, we defined a set of "basic needs" that SMEs share (such as IT equipment, water, coffee, a building, promotional material, shipments, a website, a bank, insurance, work clothing, etc.). For decisions related to those basic needs we provide simple, hands-on advice on making sustainable choices (e.g., best practices, sustainability labels). Second, for their core business, the unique part of the SME, we will offer case-based learnings (learning by example), crash courses that help SMEs distinguish actual sustainable choices from greenwashing, and materials that help them develop their own sustainability policy in a participatory process with their employees. All materials will be developed in a design thinking process together with SMEs.

We aim to scale up the second project to other European countries and to provide the materials in different languages. By tailoring sustainability information to SMEs and taking away the barriers of complexity and information overload, SMEs will be better equipped to make sustainable choices.

G04: Sharing Economy: Models, Impacts, and Case Studies

Session Chair: Maike Gossen

Room: B: Omnia, R: Quantum 2 (max. 30)

How can communities cultivate practices of sharing resources?

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In efforts to cut greenhouse gas-emissions, cities and societies across the globe are searching for new ways of organizing and supporting economic initiatives that can help to reduce the outtake of resources and promote more sustainable and/or circular economies. The onset for this study is just such an undertaking. Situated in a collaborative project together with non-academic actors, the study is a part of Swedish national strategic innovation program “Viable Cities” and its local version “Climate neutral Örebro 2030” and is exploring the sharing economy as a way of reducing consumption-based emissions while attempting to challenge the throw-away society created by mass-consumerism.

Throughout the 2010s interest in the so-called sharing economy have skyrocketed. Being an umbrella concept, the sharing economy contains neoliberal practices seeking to commodify all aspects of everyday life. Mediated by digital mobile applications while relying on venture capital as well as the exploitation of the workforce, the sharing economy has received substantial criticism. However, the sharing economy, as an umbrella concept, can also contain notions of plenitude, sufficiency, vibrant communities, and economic practices that goes beyond the growth imperative, with ideas rooted in utopian discourses making social, economic, and ecological claims. Focusing on contributions from the latter understanding of the sharing economy, this paper draws on focus group interviews with different people in different socio-spatial contexts from the medium-sized municipality of Örebro in Sweden.

The study explores how the participants experience, conceive of, and participate in sharing practices and how the municipality can support, promote, and encourage such practices that seek to reduce the outtake of resources, and how this might differ between different geographical. The study asks questions such as: What are the positive and negative experiences of sharing? What is perceived as possible to share (and what is not), and how are these boundaries negotiated and re-negotiated? What is required to create mutual trust among groups of people that share resources? By asking such questions, the paper can contribute theoretical and empirical insights on the possibilities, negotiation of boundaries, and conditions of sharing resources and how this differs between urban-rural contexts. It will also contribute to a discussion on what incentives as well as social and physical/digital infrastructural arrangements that are needed to encourage more people to participate in sharing practices which promote more sustainable economies.

Peer-to-peer food sharing platforms and food insecurity

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Food insecurity is a major global issue in both poorer as well as richer economies. Over the past few years the global pandemic has led to a dramatic increase in food insecurity related not only to economic hardship but also to factors such as supply chain disruptions (following labor shortages, or restrictions on transport and trade), and changes in food demand and access. In the US, for example, 21 million additional people are believed to have joined the food insecure during the pandemic. Similarly, in the UK, surveys conducted during the pandemic reveal that 26-28% of households with children cut down meal sizes or skipped meals due to financial difficulties, and reports from French Universities suggest high rates of meal skipping and inability to access sufficient food.

This rise in food insecurity during the pandemic took place in the context of significant amounts of food waste. Given the co-existence of both food waste and food insecurity within the same geographics, community-based interventions – including digitally enabled food sharing – have been promoted as an important policy entry point to combat food shortages and supply disruptions. Although non-monetized and monetized sharing of underutilized assets is a longstanding practice within social networks, digital technologies have reduced transaction costs, removed barriers-to-entry, and allowed sharing platforms and food sharing in particular to expand substantially.

Yet if and how the global pandemic has affected digital food sharing are not yet well understood. Leveraging a comprehensive dataset covering over 1.8 million food exchanges facilitated by Olio – a popular peer-to-peer food sharing platform between October 2019 and January 2021, we find that UK activity levels not only rose during the Covid-19 pandemic, but outperformed projections. A potential explanation for this growth might be the rise of food insecurity during the pandemic. Yet examining the sociodemographic characteristics of platform users, average user activity and food exchanges before and during the pandemic, we find no compelling evidence that the platform's pandemic-era growth results from large influx of food insecure users. Instead, we posit that the growth in digital food sharing relates to lifestyle changes potentially triggered by the pandemic.

Our findings suggest that while peer-to-peer food sharing platforms likely have a niche role to play in efforts to ensure food access, they are not a substitute for institutional solutions such as food allowances, large-scale food provisioning, or income support, and if they are to serve the food insecure, they may need to consider changes in how they operate.

Is the sharing economy more sustainable? A systematic review and synthesis of empirical evidence

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Although the digital sharing economy is commonly thought to deliver environmental benefits through more efficient use of existing product stocks, whether this is the case is not yet well understood. Reviewing over 1,400 academic papers, industry reports, and conference proceedings, we focus on studies that directly assess the environmental impacts of sharing. Consolidating the results of empirically-driven analyses, we find that sharing is not necessarily more environmental than conventional consumption, and examine if and how different factors potentially affect the environmental performance of sharing platforms. Our results show that sharing goods is generally associated with better environmental outcomes compared to sharing of accommodation or mobility, with ride-hailing emerging as particularly prone to negative environmental outcomes. We find that larger platforms are more likely to have negative environmental impacts compared to small platforms and that contrary to previous suggestions, resource ownership structure (centralized vs. peer-to-peer) and whether sharing is free or for-pay are not good proxies for environmental performance. The expectation that sharing would relieve environmental burdens weighs heavily on the notion that sharing increases use intensity thus allowing the provision of a fixed amount of utility with smaller product stocks. Critically however, synthesizing findings reported in the existing literature we see that sharing does not always increase use intensity and that even when it does, it might not deliver the expected benefits due to several reasons including platform supportive logistic operations and consumer choices such as displacing more environmental modes of transportation such as public transportation and walking for shared mobility. We conclude by highlighting remaining research gaps and offer guidance on how the sharing economy could be steered to more environmental paths.

Sharing economy rebound: The case of peer-to-peer sharing of food waste

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The digital sharing economy is commonly thought to promote sustainable consumption and improve material efficiency through better utilization of existing product stocks. However, the cost savings and convenience of using digital sharing platforms can ultimately stimulate additional demand for products and services. As a result, some or even all of the expected environmental benefits attributed to sharing could be offset, a phenomenon known as the rebound effect.

Relying on a unique dataset covering over 750,000 food items shared in the United Kingdom provided by Olio- a free, P2P sharing platform with millions of registered users worldwide, we use Environmentally Extended Input Output analysis (EEIO), econometric modeling, and geo-spatial network analysis to quantify the environmental benefits associated with food sharing and the environmental impacts incurred as users re-spend the money they saved via sharing in terms of GHG emissions, water depletion and land use under seven re-spending scenarios. We find that rebound effects can offset 59–94% of expected greenhouse gas (GHG) emission reduction, 20–81% of expected water depletion benefits, and 23–90% of land use benefit as platform users re-spent the money saved from food sharing on other goods and services. Our results demonstrate that rebound effects could limit the potential to achieve meaningful reductions in environmental burdens through sharing, and highlight the importance of incorporating rebound effects in environmental assessments of the digital sharing economy.

‘Shift Consumption’. Organising access to the shared material assets of the circular economy

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The circular economy discourse endorses sharing and efficient use of material assets. Whether for buildings, the car stock or the infrastructures such as the road network and the power grid, efficient provisioning requires the management of the timing of demand. In this paper, we propose that access rights can be conceptualised as ‘shifts consumption’ and explore the different techniques of allocating such rights. These include hard measures such as limited access to road infrastructure during rush hours, the market mechanisms of dynamic pricing of e.g. electricity, and time-varying prices of services such as car sharing and the hospitality industry.

In this paper, we review and develop a typology for demand management techniques and provide examples of how and with what effects they are being used. We also develop a critical lens towards a fair and inclusive transition to a circular economy from a perspective of daily rhythms. For pursuing circular economy and asset sharing, further understanding of who has access to prime-time consumption and what follows from being dislocated and pushed to alternative rhythmic patterns is crucial.

Circular economy literature is relatively underdeveloped regarding the broader social consequences of the extensive sharing of resources. In this paper, we follow the theory of social practices and complement the recent evolving study of flexibility capital (Powells and Fell 2019). The notion of shift consumption conceptualizes the temporal aspects of fair transitions as a broad economy-wide phenomenon and points at valuable parallels between the study of the social consequences of shift work and the intensive sharing of consumption assets.

References:

Powells, G., & Fell, M. J. (2019). Flexibility capital and flexibility justice in smart energy systems. *Energy Research & Social Science*, 54, 56-59.

G06: Sustainable Businesses in the Food Sector

Session Chair: Siet Sijtsema, tbc

Room: B: Omnia, R: Quantum 3 (max. 30)

Assessing the environmental performance of a container-based vertical farm: Case study from IKEAM

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Vertical farms (VF) have expanded rapidly in recent years as an approach to secure resilient food provisioning worldwide. With the expansion, there has been increased criticism of the sustainability of the systems, due in part to claims from the media and producers. However, there are few sustainability assessments of the implications that VFs have throughout their life cycle.

This study aims to provide an environmental life cycle assessment of a case study vertical farm located in Sweden. In particular, this study was based on a container-based vertical farm employed by IKEA to provide the store cafeteria with fresh salad. To assess the environmental performance of this system, a life cycle assessment (LCA) was conducted to assess the overall impact of producing 1 kg of salad supplied to the cafeteria. Furthermore, the LCA was conducted to highlight important 'hot-spots' of the production in order to identify improvement options and compare with conventional sourcing.

The GHG emissions impact were roughly 1.2 kg CO₂-eq. per kg of lettuce produced. The largest impacting processes were the energy demand for the light-emitting diodes (LEDs) and the ventilation system. Energy demand also contributed largely to all other impact categories assessed. The infrastructure, i.e. container and all associated machinery and technology required, also contribute to over 15% of the overall impact, showing its importance for vertical farms. The results were also found to be sensitive to the choice of life cycle inventory data for the growing media and electricity mix. Further scenarios to improve the environmental performance were also conducted. These included replacing peat with coconut coir, in addition to employing circular nutrient solutions from farm and cafeteria wastes. These mitigation options showed potential to reduce the GHG emissions. Assessments and comparisons to conventionally imported lettuce were also conducted based on input from the cafeteria for sourcing, showing that the vertical farm had emissions similar or lower than those imported lettuce varieties with similar or improved quality.

In conclusion, the results suggest that the vertical farm, despite the high energy demand, can provide lettuce to the store with comparable emissions and quality compared with imported lettuce. The results provide novel insights for the controlled environment agriculture field, vertical farming producers and retailers of the environmental performance of vertical farming container solutions, providing empirical evidence of their sustainability and viability for food provisioning locally.

Business model innovation for food system transformation: Working with the concept of tipping points in socio-ecological systems

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Business model innovation for sustainability is of rising concern in academic research, policy, and business practice. In particular in the food sector, changes in business practice are considered key to enhance more sustainable ways of production, by finding better ways to interact with other actors and elements in the supply chain, and with society and the environment overall. Whilst there are various theoretical and practical frameworks that help conceptualise and develop sustainable business models, evaluation of related innovation is mostly concerned with improvements of the economic, environmental and social performance of the individual organisation. However, little is known about whether and how efforts towards sustainable business model innovation can lead to wider system change. While good intentions may lead to successful and positive outcomes within the direct remit of an organisation (e.g. creating an environmentally-friendly alternative to an existing product/service), they might at the same time inadvertently reinforce negative system outcomes (e.g. establishing an additional market without impacting the existing).

This contribution explores the potential of business model innovation to lead to system change, based on the theoretical and empirical exploration of the concept of positive tipping points (Lenton et al. 2022) for socio-ecological food system transformation. At a positive tipping point, a small intervention can trigger a large response from a system, activating self-reinforcing feedbacks which accelerate positive systemic change. In a food system context, this means that connections and feedback loops between activities of food production, processing, distribution, preparation, and consumption and elements of the environment, society, policy, infrastructure, and institutions, lead to positive socio-economic, environmental, and public health outcomes. Working with food system actors in both the UK and the Netherlands, an experimental workshop method is developed, to identify positive, intentional tipping points identified as a starting point to conceptualise, develop and evaluate business model innovation against food system outcomes. The presentation will discuss the affordances and limitations of such an approach to embed critical system thinking into efforts for sustainable business model innovation.

Promoting the sustainable production and consumption in catering industry by indicator design and collaboration with food delivery service platform

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The demand for food delivery is increasing year by year, and food delivery platforms have become one of the fastest-growing industries under the COVID situation. While the demand for food delivery services continues to grow, people's concerns about environmental issues caused by food delivery services are also increasing. Although the food delivery industry is directly related to the generation of food packaging problems, the delivery platform has a huge market, its service interacts with consumers and catering providers directly. If the commercial impact on consumers and catering providers is effectively utilized, it has the potential to have a positive impact on consumers and food service providers. The purpose of this research is to promote the sustainable production and consumption of the catering industry through the commercial influence of the food delivery platform.

Our team collaborated with the biggest food delivery service company in Taiwan and one environmental NPO to launch the eco-friendly restaurant project. We have designed a set of eco-indicators related to restaurants and delivery services. The restaurants that have achieved the indicators and passed the screening will receive special promotions on the delivery platform's application and dining discounts for consumers to promote their business. After designing and launching of eco-friendly restaurant indicators, we construct an environmental impact rapid assessment tool to help the food delivery platform promoting their sustainability practices. We also conducted stakeholder analysis to investigate the effects of the project and consumers' perspective on this project. We evaluated whether consumers and restaurants have increased their awareness of eco-friendly indicators and have changed their actions because of the project and whether trust in sustainability labels has increased due to the participation of academic institutions and environmental NPO. We collected 602 responses were received from consumers and 29 responses from restaurants. Statistical analysis was conducted to verify the reliability of the study's hypothesis and design framework.

After launching the project for one year, there has been 780 restaurants joining the project. It is estimated that 161,000 kg waste reduction and 264,664 kg CO₂ reduction achieve through the restaurant achieving the indicators. The results of questionnaires showed that most consumers of eco-friendly restaurants and restaurant owners that applied for certification had positive attitudes toward environmental sustainability issues and recognized the professionalism of environmental groups and environmental-related academic institutions and the environmental indicators they designed for certification. In addition, 60% of consumers agreed that they would be more likely to spend money in the eco-friendly restaurants, and nearly 80% of stores agreed that the number of orders has increased, which means that consumers recognize the stores' efforts to promote environmental protection and are willing to pay for them. Finally, based on the survey results, we provide practical suggestions for future cross-disciplinary cooperation among academia, environmental organizations, and enterprises to achieve sustainable development of the food and beverage industry and reduce negative environmental impacts.

Growing-Service Systems: New Business Models for Modular Urban-Vertical Farming

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To secure sustainable and resilient food systems, new approaches, innovations, techniques, and processes are needed. In recent years, urban farming firms have been developing and experimenting with innovative approaches to expand their offerings and connect with consumers in new ways. New business models are being developed to provide functions and services instead of traditional products to meet demands from consumers, retailers, and users. As such, modular growing systems are increasing in popularity to provide fresh produce, visual appeal, transparency, and other tailor-made functions and services in so-called 'growing-service systems' (GSS); similar to product-service systems. In these new GSS business models, often modular and small-scale solutions are being developed and installed in restaurants, residential buildings, supermarkets, and other commercial spaces, often including a significant degree of automation and optimization of digital solutions to remotely control their operation. The purpose of this is to outline the breadth of these GSS solutions to highlight different examples and contexts. We qualitatively review these novel innovations through document analyses of online resources, which are followed up by questionnaires and interviews with providers and users. The results illustrate that the methods and business models employed vary greatly between different service providers. Most of these are tailor-made solutions for particular users, while the platforms are generally additive. Most solutions are found in supermarkets or directly in proximity to restaurants and catering services. We find that each has its own set of drivers and barriers, such as the market, location, interaction with users, user experience, visual experience, and vary depending on the context of their installations. The technologies and platforms employed also vary from more analog to digital solutions. Many of these are data-driven and offer many benefits from cloud-based services to monitor and optimize their performance and maintenance, with little to no intervention by users. Many of the service providers see expansion potential. Furthermore, many of the service providers also have large-scale systems, and these solutions offer a complement to their portfolio of growing services. The study offers novel insights into this emerging form of farming and in-store service offerings. As such, it is the first of its kind to distinguish these new GSS systems in this growing segment for the urban agriculture, controlled-environment agriculture, and product-service system literature.

G07: Plastics: A Challenge to Sustainable Consumption and Production

Session Chair: Hilje van der Horst, tbc

Room: B: Omnia, R: Momentum 2 (max. 30)

Plastic-free shopping as a practice variation in Aotearoa New Zealand

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Avoiding plastic packaging, particularly in food shopping, is difficult for consumers due to its pervasiveness and usefulness; it is part of a socio-technical system and entangled in consumers' everyday lives. Reconfiguration research demonstrates the conceptual benefits of practice theory in moving away from the over-emphasis on individual choices or technological solutions (Reckwitz, 2002; Shove, Pantzar & Watson, 2012). However, so far, there has been little emphasis on exploring how systems of everyday practices might adapt and evolve to become more sustainable by replacing or removing plastic in emerging stable practice variations. To this end, we focus on the emergence of plastic-free shopping as a practice variation with a distinct teleological and affective framework. Yet, it is destabilized through its competition with conventional shopping that predominates within the existing system of shopping-related norms and practices in which plastic prevails (Nielson et al., 2020).

We used purposive sampling to recruit participants who provided information-rich cases (Campbell et al., 2020). 18 participants were interviewed, with sampling concluding once data saturation was reached, enabling rich (quality) and thick (quantity) data (Fusch & Ness, 2015; Guest et al., 2006). Interviews lasted between 35 and 72 minutes, averaging 54 minutes. Unlike Fuentes et al. (2019), who studied shoppers at one zero-packaging store, or Rapp et al.'s (2017) multiple zero-packaging stores, our context is plastic-free shopping using a range of stores and supermarkets. This represents the diverse spatio-material context of plastic-free shopping in economies like New Zealand where opportunities for specialist, sustainable shopping are scarce. Reflexive Thematic Analysis was conducted through inductive and deductive data coding (Braun & Clarke, 2019).

Analysis identifies four ongoing processes in the constitution of plastic-free shopping as a new practice variation: assembly, stabilization, misalignment, and habituated compromise. During these, practitioners create, reconstitute, and change the practice of shopping through their performances. Although perfectly aligned performances allow practitioners to integrate the unique teleological and affective components of plastic-free shopping and realize its value and rewards (Schau et al., 2009), misalignment creates negative affective intensity, often in the form of frustration. Subsequent adaptation and negotiation of the plastic-free shopping template allow practitioners to 'carry on', but imperfectly and with effort. This negotiation can blur the boundaries of the emergent practice, threatening its stability.

Our findings highlight the need to recognize and attend to the fragility of plastic-free shopping and to support its emergence as stable practice variation. Our research demonstrates the important role to play by social marketers, for example, several participants discussed how

social marketing (Plastic-Free July) triggered their plastic-reduction journey. Social marketing that highlights the rewards and affective incentives in the form of benefits and social value can draw in practitioners already committed to environmental protection. It can also help practitioners develop the skills required to use zero-packaging stores, such as preparing lists and pre-weighing reusable containers as well as help consumers form networks on or offline.

Consumer awareness of microplastic pollution from domestic laundering and willingness to accept the solutions

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Microplastic pollution has been recognized as an emerging concern with microplastics being ubiquitous in our environment. Microplastics have been found in the air we breathe, the water we drink, and the food we eat, and they impact the health of aquatic organisms. A significant amount of microplastics in the marine environment come from the domestic laundering of synthetic clothing [1]. A recent study estimated that across Canada and the United States, close to 900 tonnes of synthetic microfibres make their way to aquatic environments yearly because of domestic laundering [2]. Several products are available in the market designed to reduce microplastic in washing machine effluent, and many researchers have studied the effectiveness of these products (e.g., [3], [4]). However, technical solutions are not enough to tackle this issue. Public attitudes towards these solutions are also important, but there are few studies on consumer-centred aspects of the intervention strategies, particularly in North America. This project seeks to understand whether Canadians are aware of the problems microfibres pose to the environment and the role domestic laundering plays in increasing microplastic pollution. Furthermore, the attitudes toward options that may involve consumer engagement in reducing microfibre release and the feasibility of behavioural interventions were examined. A series of focus group interviews were carried out to collect data on laundry behaviours, current levels of microfibre awareness, and willingness to adopt solutions available to reduce microfibre pollution. The thematic analysis of the data collected shows that the barriers to the adoption of solutions can be categorized into individual, social, and institutional constraints. We applied the “value-gap” model [5] to understand the barriers creating the gap between the ‘environmental concern’ and ‘pro-environmental behaviour’. They can be broken down into individuality, responsibility, and practicality. The results of this study showed that the problem of microplastics and the role of household laundering in causing their release are not well known among participants. The presentation of this research will discuss some key findings which can be used to upgrade the current technical solutions to make them more ‘user friendly’ and developing effective non-coercive intervention strategies to incentivize pro-environmental behavioral change. The findings of this study have implications for Canadian households, policy makers, and the textile and washing machine industry.

References

- [1] M. A. Browne et al., *Environmental Science and Technology*, vol. 45, no. 21, pp. 9175–9179, 2011
- [2] E. Vassilenko et al., *PLoS ONE*, vol. 16, no. 7 July, pp. 1–17, 2021.
- [3] I. E. Napper, A. C. Barrett, and R. C. Thompson, *Science of the Total Environment*, vol. 738, 2020.
- [4] H. K. McIlwraith, J. Lin, L. M. Erdle, N. Mallos, M. L. Diamond, and C. M. Rochman, *Marine Pollution Bulletin*, vol. 139, no. December 2018, pp. 40–45, 2019.
- [5] J. Blake, *Local Environment*, vol. 4, no. 3, pp. 257–278, 1999.

Does the law drive reflexivity in companies to enhance plastics circularity? A case of the EU's Single-use Plastics Directive

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Plastics production and end-of-life mismanagement are having catastrophic effects on natural ecosystems while also impacting climate change and human health. Legislative acts hold an important place in society to govern private companies towards sustainability and legislation to govern the plastics challenge is only increasing. According to reflexive environmental law (REL), legislation can influence private actor reflexivity. It does this by building autonomy and accountability in companies, and adjustability of the law to drive companies to recognise their own impacts and rethink core processes and practices, or values and functions. However, it is not known what it is precisely in law that leads to positive rethinking for sustainability challenges, or when a negative rethinking and circumventing of the law manifests. Through interviews with upstream companies producing plastics, we provide novel evidence to understand the effect of the three reflexive drivers – autonomy, accountability and adjustability – on company reflexivity. As such, this study provides unique insights into understanding how governance tools from legal institutions affect the social and/or individual reflexivity at the organizational level. By looking at 'start-of-pipe' converters, the paper takes a circular economy (CE) approach to the plastics problem. Companies complying with the Single-Use Plastics Directive in the EU are selected as a case study due to the high-producing and consuming nature of EU countries, and its recent legislative push regarding single-use plastics which form the bulk of littered plastics. Results show how the Single-Use Plastics Directive fosters positive and negative reflexivity by companies on circular plastics innovations in the short and long term. Conclusions focus on REL's potential to identify how law should be strengthened and transformed to foster reflexivity by private firms and better support the system transition to circular plastics.

Lifting up the blanket of where marine pollution really comes from: the chemical industry

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The oceans are plagued by a number of pressures, one of which is pollution by contaminants such as nutrients, chemicals and plastics. Governing these pollution is complex as the sources, often on land, are disconnected from where they end up in the oceans. Another challenge is the diversity of contaminant sources, spanning individual households and run off from roads to different economic sectors such as petrochemical, food, and other consumer goods production. While these challenges are well-recognized by both academia and policy makers, we argue in this paper that what remains hidden in the vast literature and research into these contaminants, and how their governance is failing, is the role of the chemical industry as the point-source of most marine pollution. Based on a literature review we will show that most research on marine pollution focuses on food brands packaging, agricultural practice and the intentional discharge or ocean spills of petrochemicals as the mains sources of marine contamination. However, these distinctions obscure that all these pollutants stem from the petrochemical industry. Stopping pollution at source thus needs to go beyond the economic sectors that bring these contaminants on the market, and needs to consider the roles and responsibility of the petrochemical industry. Based on this literature review, we will discuss 2 implications from this observation. First, more academic and political attention should be paid to how the petrochemical industry is regulated, is operating and is deflecting transformative action. Second, research and practice in governing marine pollution is currently fragmented across geographies, scale and sector where various types contaminants are governed separately and at varying levels of stringency. Collaboration within academia and policy makers needs to be enhanced and coordinated to develop a preventive approach for ocean pollution.

A Life Cycle Assessment of Plastic Flows and Waste Management Practices: The Case Study of Slovenia

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Over the last few decades, plastic polymers have become integral to our lives. However, their increased production rates and improper treatment practices threaten world ecosystems and human health. Increased production rates are raising concerns about the future availability of plastics, such as reserves of fossil fuels for raw material production, environmental degradation and increasingly stringent regulations on carbon emissions. In response, governments worldwide promote policies that reduce waste generation by increasing recycling rates and implementing measures that reduce the release of pollutants along the entire plastic life cycle. Through the implementation of the Zero Waste Policy, a European Strategy for Plastics in a Circular Economy, and European Green Deal, the European Union (EU) has demonstrated its commitment to tackling the current issues related to plastics production and waste management. As an EU Member State, the Republic of Slovenia (RS) is committed to improving the current plastic management issues. This research thus aims to develop a life cycle assessment (LCA) for plastic flows and waste management in Slovenia. The established LCA model will provide insight into the current use of plastic management in Slovenia. The flow of plastic polymers includes production in primary form, import and export of primary and plastic waste flows and finally, the current status of waste management of plastic waste. The model incorporates the distribution of the eight most common plastic polymers. The waste streams from primary production and secondary recycling are analysed in detail using the OpenLCA software and the Ecoinvent 3.8 database. Different recycling scenarios up to 2035 are examined under various assumptions about future recycling rates. Based on this analysis, the main environmental impacts were identified in the categories of fossil resource depletion, global warming, terrestrial ecotoxicity and non-carcinogenic human toxicity. The additional scenarios of increased recycling rates lead to an improvement in line with the EU policy to reduce CO₂ emissions and fossil fuel consumption. Although the initial results offer room for improvement, further research studies with more detailed and comprehensive data are needed. Nevertheless, the study paints a picture of the current state of plastic in Slovenia and will undoubtedly contribute to the design of future plastic waste management strategies.

G08: User engagement and sustainable product design

Session Chair: Jaco Quist

Room: B: Atlas, R: Atlas 1 (max. 80)

Designing for inclusive bio-based value chains: Involving stakeholders via Capability Sensitive Design

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There is an urgent need to replace fossil-based energy with more sustainable alternatives. Biomass from agricultural residues has been identified as a potential source for this transition. As a consequence, many new bio-based value chains will be created. This has the potential to contribute both to the energy transition as well as to local socio-economic development in the regions where biomass is sourced. However, research on global value chains and biofuel projects has shown that the risks and benefits of global value chains are not always distributed fairly. Especially stakeholders at the beginning of global value chains, such as small-scale farmers, are in a more vulnerable position. While they play a vital role, biomass producers are often underrepresented in the development of new value chains. This can result in a failed project when biomass producers are unwilling to cooperate, or lack the capabilities to fully participate in a bio-based value chain. It can also create unintended negative impact in the context where biomass is produced. Therefore, it is important to include the perspectives and capabilities of all stakeholders involved in the value chain from early stages on. Currently, a comprehensive methodology and design process for inclusive bio-based value chains is lacking. This leads to the main question of this paper: How can bio-based value chains be designed and developed in an inclusive and sustainable way?

This paper presents findings from two case studies focused on early stage design of new bio-based value chains. The first case study focuses on residues from olive oil production in Andalusia, Spain. The second case study looks at residues in the coffee and cocoa sector in the coffee region of Colombia. In both locations, fieldwork consisted of semi-structured interviews with relevant stakeholders, field observations and a scenario workshop. Capability sensitive design is used as a lens to gather information on the current context and to formulate relevant design requirements for the design of inclusive bio-based value chains. In this analysis, bio-based value chains are viewed as socio-technical systems where technical components and social arrangements are intertwined.

We claim that the design of new bio-based value chains should focus both on technical design requirements, as well as the institutional arrangements that are necessary to guide interactions between different actors and the process of distribution of benefits, opportunities, risks and benefits. Capability sensitive design is a useful approach to capture context-specific information on desired characteristics, enabling and constraining factors and to formulate concrete design requirements. Based on the case studies, context specific technical and institutional design requirements are formulated. Technical design requirements focus on choices related to type of

feedstock, logistics, biomass conversion and scale. Institutional design requirements relate to division of roles and responsibilities, ownership, contractual arrangements and policies. The case studies show that inclusivity could be achieved. This depends to a large extent on the implementation of the technology. The identified design requirements can provide useful guidance for this implementation.

Cost-based „potential finder“ to reduce GHG emissions of material goods

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With a share of 41%, manufacturing of goods is one of the largest emitters of the total (production-based) Austrian greenhouse gases (GHG), which means that there is a large leverage effect for reducing emissions (GTAP v11) in this sector. This is even higher if looking at the consumption based emissions, which includes emissions of imported (consumed) products. The aim of this research was now to address this reduction potential, and to develop a simplified method for the GHG balancing of material goods, with which companies can calculate relevant GHG shares along the life cycle of their products and thus obtain reliable improvement strategies.

The method claims to be a "potential finder" in order to answer the three essential questions guiding the project:

- What are the main shares of product-related greenhouse gas emissions?

- What potential for improvement do alternative procurement processes offer?

- What potential for improvement do circular economy strategies offer?

Established inventory based methods such as Life Cycle Assessment (LCA) acc. to ISO14040/44 or Product Carbon Footprint (PCF) require extensive data collection (bill of materials, process descriptions), as well as special software and are often to resource intensive and not commonly used by the majority of companies.

In order to overcome this obstacle and to be as simple as possible, the GHG emissions are calculated via the cost structure of the product. The cost structure of a product is usually easily available within companies and can therefore be used for an evaluation. In this cost based method so called sector-specific emission intensities in [kg CO₂eq/€] are multiplied with the costs for e.g. materials, supplier parts, energy, distribution, etc. As a result, the GHG Emissions of a product considering the whole life cycle can be displayed. On the contrary an LCA used emission factors in [kg CO₂eq/kg] for a Life cycle impact assessment.

The emission intensities are based on a Multi-Regional Input Output Analysis (MRIO-Analyse) based on (Steininger et al. (2018)). For the calculation of the emission intensities the consumption Based Accounting (CBA) was used, which accounts for emissions based on its consumption activities. All emissions are taken into account that are released along the entire production chain to satisfy the demand for goods, regardless of where the production of the respective goods (and the associated emissions) took place.

Emission intensities exist on a sectoral or regional (country) level e.g. if a component „LCD screen“ is manufactured and bought in China the emission intensity for China, Sector Electronic is multiplied by the corresponding costs.

In the validation process, selected reference products were evaluated with both methods - cost-based and life cycle inventory-based. In both cases, the relevant shares of the product-related GHG emissions in each life cycle phase are matching. Therefore companies can make reliable decision towards the reduction of GHG emissions of their material goods using this new method. Currently further validation of different types of products are tested (mass products, products with high in-house production, etc.

Gamification as a catalyst to the circular economy

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The evidence of how gamification translates emotional, social, cognitive, and motivational benefits into motivation, attitudes, and behavior toward transforming social practices keeps growing. However, the information about how and towards what aspects of the circular economy (CE) gamification can be applied is quite scattered, leading to questions such as: how is gamification discussed in existing CE literature; what kind of gamification approaches have been taken, and studied across the different facets of CE?; and, what are the potential areas for further application?

To answer these questions, this study presents a systematic literature review of the current corpus of gamification and the circular economy. This study introduces a contextual overview of the encountered CE phases, sustainability goals, sectors, and domains for which gamification was employed in the reviewed literature. Moreover, the analysis comprises perspectives on policy-making, CE transition management via gamification, as well as the design of gamification for, about, and of the circular economy.

Presenting a landscape of the most used gamification strategies and games to explore the circular economy as a system, this study highlights how bringing together emotional elements with technological possibilities facilitates the adoption of circular-oriented behaviors. The study also brings about a cautionary tale about potential issues that any societal stakeholder interested in integrating gamification into their circular process should bear in mind.

The results show that existing research on the topic is firmly focused on end-of-life activities, particularly education about recycling, whereas design, production, and use phases require more attention. Moreover, an area that remains largely unexplored is the communication potential that gamification conveys to facilitate adopting habits that lead to circular practices. Finally, from the transition management aspect, there is a strong focus on operational tasks, although gamification for tactical and strategic efforts is less explored. Based on these and further findings, the present study discusses and concludes with several avenues as a way forward for gamification as a circular economy catalyst in practice and inquiry.

Elevating consumer engagement in a Circular Economy - Cases studies from Ghana, India and the Netherlands

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Transitions to a circular economy require fundamental changes in consumer behaviour. At present, the literature on circular economy is almost uniquely focused on systems and technologies, while actors, and more specifically, consumer roles in the transition, are poorly understood (Parajuly et al., 2020). This paper attempts to close this gap by looking deeper into consumers' adoption and diffusion mechanisms of circular economy models and exploring how consumer engagement towards a circular economy can be accelerated.

To respond to this research gap, the paper conducts a systematic literature review around the circular economy and the role of consumer behaviour, followed by content analysis and case studies analysis. The paper makes three key contributions. First, it identifies different types of innovations that promote the transition to a circular economy, termed as circular innovations, which emerge at different stages of the consumption value chain - product purchase, product use, and End-of-Life product management. Second, it develops a strategy framework for fostering consumers' adoption of circular innovations. Activities proposed to promote consumer engagement form six key areas - investigation, information, infrastructure, incentives, inclusion, and inspiration. Third, the paper provides a "proof-of-principle" empirical application of the framework through three case studies of successful and ongoing circular economy initiatives: the case of a zero-waste locality, in Aashiana, India (community-led), the case of a Circular Economy accelerator hub, in Accra in Ghana (corporate-led), and the case of Europe's first 'Sharing City', Amsterdam in the Netherlands (municipality-led).

The findings of this analysis highlight the most prominent barriers and drivers that prevent or trigger consumer acceptance and adoption of circular innovations. The strategy framework proposed in this study serves as a tool to plan and implement these transformation processes while building new, more sustainable consumption habits, as well as more responsible systems of provision. Finally, the application of the strategy framework in the three case studies reveals key differences and commonalities that become evident among the three cities and considerably impact the success or failure of efforts towards transforming consumption patterns towards a circular economy model.

Civil society feedback loops as stimuli for sustainable product design

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In several countries, civil society organisations (CSO) introduced smart phone apps as a communication tool between consumers and companies. In our project, we analysed three German based apps. These apps collect feedbacks from consumers on some challenging sustainability-linked issues with regard to products (packaging material, use of palm oil, use of potential hazardous substances). They organised a feedback loop between active consumers and companies in order to influence the product design in a more sustainable direction. Our research aim was to analyse if and how these apps are considered by companies. Are they aware of the feedbacks received? How do they deal with the claims of consumers? Are the claims regarded as a free-market observation tool?

The project is based on some insights from business sociology and market expectations of business which are influenced by structural, institutional and cultural framework conditions. Companies react by developing own mechanisms to stabilize their market expectations. Concurrently, CSO and NGOs intend to change these framework conditions, e.g., by broaching environmental and health challenges. This interplay between business and CSO forms the background.

The project started with an in-depth analysis of the state with regard to the three selected apps; in addition, qualitative and semi-structured interviews with the providers of the apps have been carried out. Afterwards a written survey among companies of the four involved branches, qualitative interviews with some selected companies and the relevant industrial associations supplement the empirical phase. To bring business and app-providers together, we organised three virtual dialogues.

The empirical work showed that the analysed apps have a minor role in comparison to other business-external feedback channels (e.g., reports of external independent market test organisations). However, business confirmed the future increasing importance of the issues highlighted in the apps. Therefore, we concluded that the apps play a double role: A direct one to influence the product design and an indirect one by increasing market pressure on companies and by lobbying policy to arrange a more sustainable level playing field.

Finally, some proposals have been prepared addressing providers of the apps, e.g., addressing these pioneer-companies, business and policy.

Final results and publications of the project could be downloaded:

https://www.ioew.de/projekt/zivilgesellschaftliche_feedbackschleifen_als_impulse_fuer_eine_nachhaltige_produkentwicklung

G09: Determinants of sustainable consumer behavior

Session Chair: Kira Matus

Room: B: Atlas, R: Atlas 2 (max. 80)

Paying more for greener products: Empirical insights into consumer preferences for renewable gases in residential heating

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Consumers and their demand for goods and services play a critical role in sustainability transitions. In the residential heating sector demand for renewable gases like biomethane or Synthetic Natural Gas (SNG) could play an important role, especially for short-term decarbonization. However, these gases come with higher prices due to higher production costs. Following the Russian invasion in Ukraine, energy markets are in upheaval, resulting in unprecedented prices for electricity and natural gas. Until now, existing research has focused on the supply side and technical aspects of renewable gases, leaving the sustainability consumption aspect of these gases largely neglected. Therefore, we raise the following research questions:

- (1) Which attributes of renewable gas products are how important to consumers in the heating market and how do they differ between consumer groups?
- (2) How do consumers differ in their willingness-to-pay for different product attributes?

Method

Our study builds upon a Discrete-Choice-Experiment (DCE) implemented through an online survey. We determine consumer preferences, willingness-to-pay (WTP) and their differences between consumer segments through part-worth utilities on a pseudo-individual level. Our study design comprised 11 choice tasks, where participants had to make a decision between four renewable gas products and one default option (=100% natural gas). The products were made up of the combination of six relevant attributes (e.g. share of renewable gas, labels) and their levels (e.g. 5% SNG share, two labels). Compared to other DCEs in the field of energy research we opted for an unique approach to the most central attribute, price: We calculated an individual yearly price of the default product for each participant using individual residential parameters (i.e. dwelling type, refurbishment status, living space), which allows a much more realistic presentation of choice sets compared to e.g. prices per kWh. We decomposed the natural gas price and calculated price increases for the different shares of renewable gases. Data collection in June 2021 (before the war in Ukraine) yielded 523 responses. Our study is situated in Germany, however we consider our results applicable to other national settings with a high dependency on natural gas.

Results and discussion

Our results indicate that the share of renewables and the yearly price influence the purchasing decision comparably strongly. For those having knowledge about biomethane, the price

argument is of lower importance, indicating a higher WTP. When looking at preferences for different gases in an ideal world of zero price increases, consumers surprisingly clearly prefer biomethane over SNG. This is even more pronounced for those with knowledge, who also show significantly higher WTPs for other attributes (e.g. labels).

Our results indicate that there is potential in a voluntary market for renewable gases. Market conditions have however changed since the war in Ukraine: The uncertain supply of fossil energy and the desire for more diversified sources could pave the way for renewable gases. At the same time, inflation and rising energy prices unsettle consumers. We will discuss our results against this recent development.

How long ahead of time in the future are people considering?— Future horizon for sustainable society

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How long ahead of time in the future are people considering when making their decisions? The latest study by the authors showed that peoples' tendency to future neglect resulted in their taking an unsustainable option. If so, we would fail to consider the benefits and human rights of future generations who are out of the scope of a such future horizon, contrary to expectation to consider (Tremmel 2006, González-Ricoy and Gosseries 2016, Hauser et al. 2014).

There have been many studies about people's perception of time perspectives including the future (e.g., Levin 1951, Nuttin 1985, Zimbardo & Boyd 1999), and Hofstede and Minkov (2010) explained differences in long-term orientation between countries. However, these studies only addressed general tendency about time and the future and the scope of the time is not necessarily long to cover beyond a single generation.

Therefore, we surveyed the lengths of the future horizon the Japanese respondents have in mind in making various decisions as a first trial case, distinguishing ideal (norm) and reality. The respondents were men and women in different age groups ranging from 20 years old to over 70 years old, with equal numbers in each group. A total of 2880 responses participated in the Internet questionnaire survey.

The results showed that there was an approximately three-fold difference in the estimated average years of the future horizon between ideal and actual lengths (the actual lengths were shorter). The average respondent thinks that decisions about private matters should be made in 6 to 8 years' horizon, and decisions about public matters should be made in up to 25 years' horizon. However, the real lengths of the future horizon were less than a decade. We analyzed the relationships between the lengths of the future horizon and respondents' personal attributes, such as age, sex, income, marital status, and core beliefs, by regression analysis to identify the determinants of the future horizon. Implications for sustainable consumption and society will be discussed based on the results.

Gains and Losses Associated with Consumption Reduction: A Consumer Perspective

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Sufficiency as a strategy for mitigating climate change stresses reducing consumption levels and as such the use of resources in affluent countries. By aiming at demand-side behavior change, sufficiency complements efficiency and consistency, which are both technology-based strategies. While conceptual work on sufficiency is gaining momentum, research on how to motivate mainstream consumers to reduce their consumption is yet scarce.

According to expectancy-value models, expected gains and losses play a major role in human motivation. If expected losses outweigh gains, consumers refrain from implementing lifestyle changes. Studies on gain framing demonstrate that emphasizing gains in communication has positive effects on promoting behavior change. In light of the above, this research aims to contribute to the consumer sufficiency literature by identifying gains and losses consumers associate with reduced consumption.

The present study applied a deductive-inductive approach to develop a category system of gains and losses associated with consumption reduction. A systematic review on sufficiency-related lifestyles (e.g., voluntary simplicity, minimalism), yielding a pool of 142 papers, built the basis for category formation of gains and losses. This preliminary category system was then complemented using data from a qualitative online study with a quota sample of 166 Austrian participants. Using a scenario-based approach, we presented participants a vignette introducing a person who reduced consumption across domains (including housing, food, energy, and mobility). Assuming different answers depending on social distance, we randomly assigned participants to one of two conditions: in the condition “self” participants had to imagine living like the person from the vignette; in the condition “proxy”, they had to imagine a friend living like the person from the vignette. Participants were then asked to write down gains and losses they/their friend would expect when adopting the described lifestyle.

Answers were coded based on the preliminary category system by two independent raters (Cohen's Kappa = .78). The final category system comprised three categories (personal, social, altruistic) with three to four subcategories each. Subcategories in the personal category related to identity, well-being, resources, and agency. The social category reflected social affiliation, social judgment, and social role conflicts. In the altruistic category, gains and losses were of environmental, economic, and societal nature.

Overall, findings show that gains regarding well-being, as frequently discussed in the literature, were also associated with consumption reduction. Gains regarding identity and self-fulfillment, were frequently discussed in literature, but rarely named by respondents. Instead, dominant expected gains related to saving money and feelings of warm glow.

In sum, this ongoing research proposes a category system of expected gains and losses of consumption reduction from a consumer perspective. Addressing gains in environmental communication or policy measures might assist efforts to motivate demand-side transformation. Losses, by contrast, might represent relevant barriers to consumption reduction that need to be considered. In a follow-up study, we aim to quantify the relative relevance of these identified gains and losses for consumers' willingness to reduce consumption.

Motivations, Values, Beliefs, and Norms of the Sustainability Conscious Consumer

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Driven by a growing global middle-class and economic development, global apparel production represents more than 60% of textiles used in the last 15 years. Apparel and footwear consumption is projected to rise by 63% in 2030, an increase of 64 million tons to 102 million tons. Fast changing trends and low prices are catalysts in the consumer's desire to purchase more and discard rapidly. In fact, the average American consumer purchases 66 new apparel items annually, one new item every 5.5 days, but wears them 40% less. Though the issue is most evident in Western nations such as the United States, increased apparel utilization has become a worldwide concern as China is experiencing a 70% deduction in clothing usage in the last 15 years. However, 'slow fashion' consumer movements and practices are evolving whereupon the consumer is exchanging current 'fast fashion' behaviors for environmentally charged practices involving repair and reuse. These communities of practice and the resulting subcultures are emerging quickly outside of the mainstream fashion system. The COVID-19 pandemic has also had profound impact on the consumer's sustainable behaviors as more than 60% of consumers spent less money on fashion and indicated they will continue decreased spending in the future. In addition, a growing number of consumers are choosing to repair apparel rather than purchasing new and discarding less often. Given these changing consumer trends this study addresses the motivations, values, beliefs, and norms of the consumer engaging in sustainable consumption behaviors (SCB). The Values-Belief-Norm (VBN) theory was used as a framework to explain beliefs and behaviors, serving as predictors for attitudes and behavioral intentions. It is beneficial as a theoretical model because it has been shown to explain 19-35% of variance depending on the actual behavior. Additionally, motivation is often used in apparel studies to explain why people engage in SCB. Data was collected through interviews with 14 female participants from multiple countries selected because of their SCB. Findings indicate poor fit is a motivating factor to extend apparel life. The ability to make apparel modifications gave participants a sense of control and empowerment. Furthermore, making modifications to apparel served as a creative outlet allowing participants to experience joy in reworking their item to continue its usable life. One unique theme that emerged from participants was the idea that apparel is an unlimited reusable resource. This study makes valuable contributions to both apparel industry and academic practitioners alike as a need exists to revise consumer behavior models based on underlying values, beliefs, and norms of the sustainability focused consumer. This would provide a platform for apparel industry practitioners to increase understanding of this consumer and update current business models to reflect their wants and needs. Moreover, advancements within literature have placed increased interest on pragmatic change (e.g., social retail marketing, supply chain) rather than radical change (e.g., consumer practices) which is necessary as the consumer is the ultimate end user and determines the fate of their unwanted apparel.

G10: Changing the game of consumption – roleplaying in mega format to enable dialogue on pathways towards sustainable consumption

Session Chair: Åsa Svenfelt

Room: B: Omnia, R: Spectrum (max. 30)

The purpose of this session is to explore the potential of role playing as means to engage and create conditions for reflection and thereby to support concrete transformations towards sustainable consumption. In the project “Changing the game of consumption” we have developed a Megagame, a large-scale role playing game, as a format for discussion and dialogue about sustainable consumption.

The game is intended as an arena for discussion and reflection on who has the power to enable sustainable consumption, and more importantly, to provide space for perspectives from groups that are not usually in the room when transitions towards sustainable consumption are discussed. Hence, the game has potential to be a concrete tool in transformation towards just and inclusive sustainable futures.

During 2023, the gaming sessions will be carried out in Sweden with groups with different socioeconomic contexts, and we would also like to try the game out in contexts outside of Sweden.

This session will therefore include a short version of a game session to try out some of the basic concepts, but also time to discuss the relevance of this and similar dialogue tools in different contexts and countries. Our intention is that after the project is finished in 2024, materials will be available to others who want to use the game platform we develop, to be used freely by both players and organizations who want to use the format in transitioning to sustainable consumption.

Line-up of speakers:

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Åsa Svenfelt, KTH and Linköping University, Sweden fms.asa.svenfelt@gmail.com

G11: How can society be engaged in the transition towards a circular economy?

Session Chair: Sarah De Coninck

Room: B: Omnia, R: Momentum 1 (max. 30)

The European Green Deal strives for economic growth without exhausting resources while promising to leave no region or individual behind. Circular economy plays a key role in reaching optimal resource efficiency necessary to reach this goal. For this transition to be successful, multistakeholder engagement, including but not limited to policy makers, consumers and businesses, is necessary. The 'Engaged and Entrepreneurial European University as Driver for European Smart and Sustainable Region' (E³UDRES²) consortium created several transformative spaces for multistakeholder engagement. Results and methodologies from the E³UDRES² I-Living Labs (ILL) and the E³UDRES² Change Corner are presented during this session.

In an ILL, a transdisciplinary international group of students creates solutions for challenges presented by regional stakeholders. As such, students act as change agents, developing skills for the transition to a circular economy and transforming their regions into smart and sustainable regions. Simultaneously, the Change Corner aims to be a space to empower students, citizens, lecturers and stakeholders in the transition towards a circular economy. In the Change Corner, good practices from the regions of the E³UDRES² consortium are presented, followed by a discussion of needs and good practices of participants in the Change Corner sessions. In preparation of this discussion, participants are asked to participate in a photovoice study. In a photovoice study, participants are asked to identify and document good practices and challenges encountered in their daily life by means of photography. Grounded in ethnographic research techniques, photovoice provides a means to communicate about and expose personal and community concerns.

As such, the session focuses on different methodologies that can be used for multistakeholder engagement in the transition towards a circular economy. This multistakeholder engagement will be key in transforming towards more sustainable consumption. The session departs from the perspective that transdisciplinarity, providing a safe space to talk about barriers and transformative learning are essential ingredients in proactively engaging stakeholders across all layers of society.

Line-up of speakers:

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Ann Reulens, University College Leuven Limburg, ann.reulens@ucll.be

G13: 1.5 Degree Lifestyles

Session Chair: Doris Fuchs

Room: B: Omnia, R: Podium (max. 269)

How structures enable or hinder changes to provisioning systems and 1.5° lifestyles in Europe

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Presenter: Halliki Kreinin, halliki.kreinin@uni-muenster.de (in person)

While individuals have some agency to change their lifestyles, significant steps towards sustainable lifestyles require deeper structural changes to production, processing, distribution, and consumption – in other words, to provisioning systems. This study collates and ranks structures that are key to changes in provisioning systems needed for the implementation of lifestyles compatible with the targets of the Paris Agreement. After first discussing the connections between the lifestyles, agents, structures, and systems using different sociological accounts of consumption, we examine the structural factors that prevent or enable the adoption of sustainable practices within wider provisioning systems. To categorise structures, we distinguish between (1) ideational structures relating to norms, values, or discourse and material structures relating to factors such as money, market control, and control of technology or natural resources, and (2) shallow and deep structures reflecting that changing some structures is possible within established power relations while others require fundamental challenges to existing power relations. To gain a profound understanding of how different types of structures interact and which actors and agents they involve, we draw on a literature review of 122 studies to identify relevant structures. Thereafter we undertake a Delphi-ranking method to narrow the number of structures down to 22 key structural barriers and enablers, and use this list as the spring-board for 36 interviewed experts asked to rank structures according to their impact. Against this background, we discuss how provisioning systems affect lifestyles in the consumption areas of housing, mobility, nutrition and leisure. We conclude that a concerted effort towards structural change, at the scale of, or likely beyond, the Marshall plan, may not only be a last chance to avoid climate disaster but also improve wellbeing and safety compared to current systems.

Who is living a 1.5 degree compatible lifestyle? An analysis of attitudes, actions, consumption choices and sociodemographic factors of those living 1.5 degree compatible lifestyles in the Nordic context.

Sarah Olson, University of Iceland, Reykjavík, Iceland, sco3@hi.is
Presenter: Sarah Olson, sco3@hi.is (in person)

Greenhouse gas (GHG) emissions need to be drastically reduced in order to meet the aspirational limits of the Paris Agreement. Many climate mitigation scenarios mainly focus on the technological approaches to reducing emissions, but changes in consumption choices and lifestyles also have the potential to significantly reduce emissions. More than 60% of GHG emissions can be attributed to household consumption and the recent IPCC report highlighted the importance of demand-side solutions. In this study, we analyze those individuals who are living a 1.5 degree compatible lifestyle to see how their attitudes, actions, consumption choices and other sociodemographic factors contribute to their 1.5 degree compatible footprints in the Nordic context. To examine this, we utilized the data from a carbon footprint calculator survey that was conducted from the spring of 2021 to the fall of 2022, which received around 8,000 responses. The survey participants were all residents of one of the Nordic countries and were asked a variety of questions about their consumption over the past year in order to calculate their consumption-based carbon footprints. Consumption-based carbon footprints allocate the GHG emissions from the production of a good or service to the end users in order to capture the emissions embodied in global trade. The footprints were calculated with an input-output hybrid assessment model. Information about the respondents' climate attitudes, pro-climate actions, general well-being, and other socio-demographic factors were also collected in the survey and bivariate analysis and regression analysis were used to explore how these aspects might be reflected in carbon footprints. We found that only a small number (1089) of survey respondents were living a 1.5 degree compatible lifestyle and that there were many different lifestyles that could reach this level. Most frequently those who achieved this were couples in the lower income brackets and they had higher adoption rates of low-carbon consumption choices than the rest of the survey participants, but these choices were still chosen less than half the time with the exception of not flying and buying renewable energy for the home. They also showed a higher level of climate concern than the rest of the survey respondents and similar levels of general well-being in some of the countries. Our study gives examples of how individuals are living 1.5 degree compatible lifestyles, but it also illustrates the potential of and necessity for high adoption rates of multiple low-carbon consumption choices.

Structural, social, and contextual challenges and resources toward a 1.5 sustainable lifestyle in five European countries

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The urgency to achieve carbon neutrality between 2030-2050 in compliance with the agreements adopted by the European Union and its member states has required the adoption of strategies that favour change in daily consumption habits, lifestyles, and investment decisions. To achieve this purpose it is necessary, first, to know what internal and external facilitators and barriers people face when adopting a low-emission lifestyle. One of the purposes of the H2020 project "Policies and tools for the integration of 1.5° lifestyles" is to improve the understanding of the options and challenges that citizen face in moving to 1.5° lifestyles from household perspective, reflecting on societal, political, and economic structures that they experience as enablers or barriers. This paper focuses on the main structural, social, cultural and/or contextual challenges and facilitators experienced by people who have changed their lifestyles. A qualitative study was carried out using in-depth interviews in five European countries (Germany, Hungary, Latvia, Spain, and Sweden). Informants were people who have made substantial changes (at least two years ago) towards the adoption of 1.5° life choices in at least two areas (household, mobility, consumption, leisure). The main findings have shown the presence of structural (mainly economic, infrastructural, knowledge, legal, political, and technological) or socio-cultural obstacles (lack of collective action and responsibility, lack of support, lack of education and even a certain cultural and social inertia, among others). In contrast to these barriers to lifestyle change, structural resources have also been found (mainly economic and infrastructural, but also political), as well as contextual (related to the possibilities of land use, mobility facilities and resources in the immediate environment) and social resources (acceptance and greater social awareness, mutual respect, media influence, spirituality, etc.). Precisely, a key aspect has been to note the relevance of social support, identified both in the close circle (family, friends) and in environments of like-minded people (such as sustainability initiatives, social and political movements dealing with environmental issues). The latter facilitate the availability of governance, material and, above all, knowledge, and social resources. In sum, this analysis allows for a deeper understanding of the facilitators and barriers present in the immediate and distant environment in the process of citizens' transition to a low-carbon lifestyle.

Preferences, enablers and barriers for 1.5°C lifestyle options – Findings from citizen thinking labs in five EU countries

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The Paris Agreement sets the goal of limiting global warming preferably to 1.5°C compared to pre-industrial levels. Achieving this goal requires changing lifestyles in addition to technological innovation. The EU 1.5° Lifestyles project identifies and explores lifestyle options compatible with the 1.5°C goal in four consumption domains - nutrition, housing, mobility, and leisure - in 5 EU case countries: Germany, Hungary, Latvia, Spain and Sweden.

Lifestyle options were studied through a mixed-method approach comprising a literature review, expert interviews, and Citizen Thinking Labs (CTLs). The literature review was conducted to identify a list of relevant low-carbon lifestyle options. This list was then validated through interviews with 30 experts across the case countries and at the European level. The lifestyle options became the basis of the CTLs for which 20-25 citizens with diverse socio-demographic characteristics were selected in each case country. Preparing for the CTL, the participants provided information on their current lifestyles in an online survey, based on which their lifestyle carbon footprints were calculated using multi-regional input-output analysis. The country-specific CO₂e reduction potential of each lifestyle option was also calculated. A “Climate Puzzle” board game was adapted to the project context.

During the CTLs, citizens used the puzzle to choose relevant lifestyle options to achieve the recognised goal of 2.5 tonnes CO₂e/cap/yr by 2030 from their original lifestyle carbon footprint. Individual preferences for different options were documented and later analysed. Then, group discussions were held to discuss some of the most important barriers to the uptake of lifestyle options identified. The discussion focused not only on the individual's level but also on structural barriers and what could help overcome them from the citizens' point of view.

This contribution summarises the outcomes of the CTLs and offers comparative insights. For example, some lifestyle options, such as switching entirely to a vegan diet or sharing options for housing (e.g. sharing equipment or living space) or cars, were some of the least preferred options, whereas switching to efficient lighting and reducing food waste were popular amongst all countries. The discussions on personal and structural barriers, and structural changes required to overcome them, revealed that options to reduce living space are often hindered by a lack of smaller affordable flats in cities. Eating vegan or vegetarian dishes was often impeded by a) a lack of knowledge about the preparation of vegan/vegetarian alternatives and b) health concerns. One of the main structural barriers to limiting private car use was the lack of public transport services, especially in rural areas.

Overall, the findings from this research contribute to designing possible pathways that citizens may find acceptable for transitioning to 1.5°C lifestyles. The study also discusses structural changes that could increase the acceptability and uptake of options that citizens currently do not favour. These outcomes will be discussed during Stakeholder Thinking Labs involving decision-makers, in future Citizens Thinking Labs, and later in policy workshops.

1.5-degree lifestyles: Latvian citizens' perspective

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Presenter: Jānis Brizga, janis@zalabriviba.lv (in person)

Lifestyles have an important impact on the climate. Personal consumption behaviour in terms of mobility patterns, housing, food, and leisure choices are responsible for most of the carbon footprint created. A variety of studies are looking into different pro-environmental behaviours (actions) trying to quantify their contribution to footprint reduction. In this study, we analyzed those actions trying to identify the ones people are open to introducing in their everyday lives and those people refuse to apply, and also the drivers and enablers behind these choices. To do so a citizen's thinking lab that included 22 randomly selected individuals from Latvia covering different geographical locations, age, genders, and income groups was organized. The average footprint of the participants (5.9 t CO₂e/cap; lowest /highest footprint was: 3.8/8.9 t CO₂e/cap) was very close to the national average (national average 5.8 t CO₂e/cap). The results demonstrate that the most accepted options were those that do not require significant lifestyle changes or investments but also increase convenience. From a personal point of view, some of the most popular responses for acceptancy were economic reasoning – you can save by investing in energy-efficient devices, saving water, and avoiding food waste. However, many of the participants also highlighted environmental and climate concerns as important motivations.

At the same time the least accepted options were those that require significant changes to both lifestyles and infrastructures. From a structural point of view, the barriers are related to settings and regulations in the current local food system and housing. The protein-high products in Latvia mostly include meat and dairy products, while popular vegan and vegetarian products are not popular. In regards to housing, the majority of the population is already living in overcrowded spaces while for others the homeowner market makes moving to smaller spaces feel burdensome. From a personal point of view, barriers related to attitudes and norms as a vegetarian culture has come to Latvia only recently, but shared housing is associated with the recent past in overcrowded Soviet communal flats.

The results demonstrate that options that do not conflict with comfort (e.g. technological) were selected first, but then it also depends if people have the available resources to invest in these technologies (e.g. purchasing an electric car, installing solar panels). Options like decreasing food waste and drinking tap water citizens consider manageable but they mostly did not associate these with climate impacts.

G14: Knowledge Co-Production and Social Learning

Session Chair: Vivian Frick

Room: B: Omnia, R: Momentum 3 (max. 30)

Holistic Sustainable Development Impact Assessment of Foodcoops – A Participatory Action Research Case Study from Austria

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Problem statement: The concept of sustainable development requires a comprehensive and complex understanding. Although interest in consumer networks has grown in recent decades (e.g. Albinsson et al., 2021), it is uncertain whether such networks can actually contribute to sustainable development (Forssell and Lankoski, 2015) or even have adverse effects (Buhalis et al., 2020).

Research aim: The aim of this project is to evaluate a selected Austrian consumer network with regard to the achievement of defined criteria of sustainable development, whereby sustainable development is understood as a holistic, comprehensive concept.

Methods: We conduct a case study in an Austrian foodcoop. Special focus is put on the active involvement of the members of this network (consumers and producers). Through their experiences, they have valuable expert knowledge and can thus make an important contribution to the planned research. This active involvement of "amateurs" in research is known as Citizen Science which opens up new perspectives in research projects and promotes dialogue between science and society at eye level (Plattform Österreich forscht. Universität für Bodenkultur Wien (BOKU), 2021).

The indicators are defined with the active involvement of relevant stakeholders in order to ensure the relevance of the research for practice. To select the indicators, we also rely on previous research steps: a systematic literature review, a logic model that was developed as a result, and a quantitative ranking of the possible indicators.

To ensure commitment and open communication, we pay attention to ongoing communication with the people involved and actively participate and help in events, such as meetings, festivals and gatherings. This method is called participatory action research, in which the focus is not on researching individuals, but on researching group dynamics, contexts and culture (McTaggart, 1991, Selener, 1992). In this way, even deeper insights can be gained and insider knowledge to be leveraged that would otherwise remain hidden if the researchers took a purely outsider view with minimal stakeholder involvement.

Findings: This is an ongoing study. We will present which indicators for sustainable development have been developed and selected together with the relevant stakeholders. Furthermore, we can present first results on how the indicators are measured in the case study and what impact the selected foodcoop has on sustainable development.

Practical and scientific implications: Foodcoops can use the knowledge generated to attract and recruit new members, continuously improve in the identified criteria for sustainable development, and strengthen engagement, retention and motivation of existing members by providing information on relevant criteria for sustainable development. Non-members can use this

information for deciding whether to participate in such networks. Policy makers and other decision makers can use the results to support consumer networks from a political point of view and thus link bottom-up initiatives and top-down structures and public administration in the regions. The results can be used to justify funding or other support. Researchers have the opportunity to use the results to standardize the assessment and reporting of sustainable development in consumer networks in further research.

16th APRSCP Overview: Bridging Net Zero Transition by SCP and Circular Economy

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Presenter: Anthony Shun Fung Chiu (in person)

The 16th APRSCP was conducted in Bangkok on November 18-25, 2022, and organized by the Thailand SCP Network. The roundtable deliberated around the issues of net zero transition through (1) Public-Private Regional Initiatives & Cooperation; (2) SCP mid-term Regional Program/ Activities Implementation; (3) Role of Future Technologies; (4) Driving Forces; (5) priority sectors such as sustainable construction (materials); (6) Collaborative Actions, particular focus on Bio-Circular-Green (BCG) initiatives and National Green Directories. The APRSCP also deliberated on the Extended Producer Responsibilities of plastic (ocean issues), PPP (plastics), and food value chain. The Roundtable report presented the conclusions of the stakeholder discussion, based on the regional conditions.

Socio-ecological vision for sharing

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Presenter: Diana Ivanova (in person)

There are multiple crises unfolding from multidimensional ecological crises to social crises, which have been heavily influenced or even share a common root in the tendencies of our current economic system. Sharing has been proposed as an effective strategy to reduce the environmental and social burden associated with consumption. Yet, a critical approach to sharing is needed to make sure that it does not further some of the challenges that it aims to address. Capitalist tendencies such as commodification and profit accumulation run contrary to the sustainability potential of sharing. We highlight a criteria for sustainable sharing – or safe and just sharing – which aims to help enable decent living for all and tackle some of the major crises of our time, including though not necessarily limited to, climate change and environmental degradation, rising economic inequality and lack of community. We conclude by proposing governance principles and policies that would support the initiation and development of safe and just sharing.

H: Saturday, July 8, 9.30-10.45

H01: Inclusive futures: transforming the ordinary

Session Chair: Jonas House

Room: B: Omnia, R: Quantum 4 (max. 30)

Experimenting with futures of consumption

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Recent years have seen burgeoning social-scientific debates on the future. As well being a source of significant theoretical development, the field has generated a range of methodological tools for understanding anticipated futures and their effect on the present. These methodological approaches generally fall into three broad (non-exclusive) categories.

First, the collective generation of possible, plausible and desirable futures: for example, in 'visioning', 'backcasting' or scenario development methods. Second, the exploration of existing visions of the future and how these may bear upon present human activity: for example, in elucidating the future orientation(s) of current domestic practices. Third, the testing of visions of the future or anticipated future scenarios: for example, through war gaming, speculative design, or 'prehearsals'. A key aspect of this latter approach is experiencing the future: "to bring the worlds of tomorrow into the present in a way that can be experienced directly", using methods such as interventions, installations or speculative artefacts to generate insight into potential futures "[i]n the absence of functional time-travel" (Kuzmanovic & Gaffney 2017: 110).

Our central argument in this paper is that methodologies for testing or experiencing the future represent a valuable resource for social scientific research on (future) sustainable food consumption, and merit further attention. We begin by bringing three social-scientific research literatures into dialogue: on consumption, on the future, and on experimentation. Then, drawing on our recent qualitative research projects – which investigated alternative proteins and sustainable food futures in the Netherlands and Norway – we reflect on fruitful ways that experimental approaches can complement other methodological tools, such as in-depth interviews, participant diaries, and auto-photography. We set out a case for experimentation, broadly conceived, as a promising addition to the methodological repertoire of consumption research.

References

Kuzmanovic, M., & Gaffney, N. (2017). Enacting futures in postnormal times. *Futures*, 86, 107–117.

What will energy be for? Mapping future energy practices in underprivileged neighbourhoods

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One of the major challenges of a just and effective energy transition is to confront intertwined technical and social issues. Especially in households with lower incomes, retrofit measures often do not live up to expectations (Brom et al., 2019) and opportunities that build on the already existing strategies of residents to save energy might be missed. The (often normative) assumptions behind energy technologies do not always take into account the diverse needs, expectations, and practices in underprivileged neighborhoods. Effectively co-shaping domestic energy demand, through energy relevant technology interfaces and governance procedures, therefore requires in-depth knowledge of 'What energy is for' (Shove and Walker 2014), i.e. a situated understanding of the mundane everyday activities and circumstances that result in particular patterns and levels of energy usage (Shove and Walker 2014). However, as also argued by these and other authors, energy-consuming everyday practices such as cooking, laundering, getting around, and keeping warm are dynamic; they change over time (Shove et al. 2012). Only focusing on the present is therefore not sufficient to better match energy technologies with everyday life. Not only because future everyday life can be expected to be different from today, but also because (technological) interventions co-shape these futures (Kuijer and Watson 2017).

We present a case study set-up that maps the diverse (future) energy practices of residents of two Living Labs in underprivileged, soon to be renovated neighbourhoods in the Dutch cities of Nijmegen and Gemert. By integrating design research methods with participatory research methods, this study aims to identify frictions and opportunities in co-shaping - e.g. through the technological configurations in the home - future household energy demand in just and effective ways. To create detailed maps of 'what [resident's] energy is [expected to be] for' (Shove and Walker 2014), we combine quantitative energy-consumption data and qualitative data on resident's current and aspired everyday practices. In our study design we are inspired by sensory ethnography (Pink 2015), and tailored interventions, including data-enabled design probes (Bogers et al. 2016; Irwin et al. 2014).

We build on concepts of energy justice (e.g. Sovacool, Hess, and Cantoni 2021) to reflect on the way technological interventions mediate everyday practices of sociocultural value and notions of comfort and convenience (Shove 2003). We use the theoretical lenses of Social Practice Theories (e.g., Shove 2012; Strengers and Maller 2015) and methodologies drawn from Futures Studies (e.g., Kuijer 2021; Pink et al. 2016; Haarbosch, Kaufmann, and Veenman 2021) to chart the future trajectories towards just energy practices (Rasch and Köhne 2017) and develop new understandings of how 'non-mainstream' practices with current and novel energy technologies could co-evolve towards regional and national objectives concerning energy-neutral buildings. The (preliminary) findings are expected to offer insights into the sensorial and situated aspects of resident's everyday interactions with energy that are self-evident yet crucial to understanding energy demand, in the here and now, and in the future. These insights will inform technological

and design practices that articulates and prioritizes residents' needs and expertise, and involves users in exploring the notions and conventions underlying energy demand.

- Bogers, Sander, Joep Frens, Janne van Kollenburg, Eva Deckers, and Caroline Hummels. 2016. "Connected Baby Bottle: A Design Case Study Towards a Framework for Data-Enabled Design." In *Proceedings of the 2016 ACM Conference on Designing Interactive Systems*, 301–11. DIS '16. New York, NY, USA: Association for Computing Machinery. <https://doi.org/10.1145/2901790.2901855>.
- Brom, Paula van den, Arjen Meijer, and Henk Visscher. 2019. "Actual Energy Saving Effects of Thermal Renovations in Dwellings—Longitudinal Data Analysis Including Building and Occupant Characteristics." *Energy and Buildings* 182: 251–63. <https://doi.org/10.1016/j.enbuild.2018.10.025>.
- Haarbosch, Simone, Maria Kaufmann, and Sietske Veenman. 2021. "A Mismatch in Future Narratives? A Comparative Analysis Between Energy Futures in Policy and of Citizens." *Frontiers in Sustainable Cities* 3 (July): 654162. <https://doi.org/10.3389/frsc.2021.654162>.
- Irwin, Germaine, Nilanjan Banerjee, Amy Hurst, and Sami Rollins. 2014. "Understanding Context Governing Energy Consumption in Homes." In *CHI '14 Extended Abstracts on Human Factors in Computing Systems*, 2443–48. CHI EA '14. New York, NY, USA: Association for Computing Machinery. <https://doi.org/10.1145/2559206.2581335>.
- Kuijjer, S.C. (Lenneke). 2021. *Exploring Probable Futures of Summer Comfort in Dutch Households: Phase 1: Anticipating the Role of Smart Technologies in the Dynamics of Everyday Life*. Vol. 1. Eindhoven: Eindhoven University of Technology.
- Pink, Sarah. 2015. *Doing Sensory Ethnography*. SAGE Publications.
- Pink, Sarah, Yolande Strengers, Marta Fernandez, and Amalia Sabiescu. 2016. "Understanding Energy Futures through Everyday Life Observation Following an Ethnographic Approach." In *41st IAHS World Congress on Housing Sustainability and Innovation for the Future*, September 13 to 16, 2016: Albufeira, Algarve, Portugal - Proceedings. International Association for Housing Science. <https://research.monash.edu/en/publications/understanding-energy-futures-through-everyday-life-observation-fo>.
- Rasch, Elisabet, and Michiel Köhne. 2017. Practices and imaginations of energy justice in transition. A case study of the Noordoostpolder, the Netherlands. *Energy Policy*, Volume 107, 2017, Pages 607-614, ISSN 0301-4215, <https://doi.org/10.1016/j.enpol.2017.03.037>.
- Shove, Elizabeth. 2003. "Converging Conventions of Comfort, Cleanliness and Convenience." *Journal of Consumer Policy* 26 (4): 395–418. <https://doi.org/10.1023/A:1026362829781>.
- Shove, Elizabeth, and Gordon Walker. 2014. "What Is Energy For? Social Practice and Energy Demand." *Theory, Culture & Society* 31 (5): 41–58. <https://doi.org/10.1177/0263276414536746>.
- Shove, Elizabeth, Mika Pantzar, and Matt Watson. "The Dynamics of Social Practice." 2012. SAGE Publications Ltd. <https://uk.sagepub.com/en-gb/eur/the-dynamics-of-social-practice/book235021>.
- Sovacool, Benjamin K., David J. Hess, and Roberto Cantoni. 2021. "Energy Transitions from the Cradle to the Grave: A Meta-Theoretical Framework Integrating Responsible Innovation, Social Practices, and Energy Justice." *Energy Research and Social Science* 75 (May): a102027. <https://doi.org/10.1016/j.erss.2021.102027>.
- Sunikka-Blank, Minna, and Ray Galvin. 2012. "Introducing the Prebound Effect: The Gap between Performance and Actual Energy Consumption." *Building Research and Information - BUILDING RES INFORM* 40 (June): 260–73. <https://doi.org/10.1080/09613218.2012.690952>.
- Strengers, Y., & Maller, C. 2015. *Social practices, intervention and sustainability*. Routledge/Taylor & Francis Group.

Youth Food Futures: Appetites and Aspirations of Adolescents in Vietnam

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Young generations have a considerable stake in present and future trajectories of food system transformations. For inclusive and effective food systems governance, it is crucial to understand the practices and the visions of adolescents as both current and future stakeholders.

As food consumers, they are predominantly portrayed as either victims or agents of change.

However, this binary does not do justice to the more complex and versatile interrelations between adolescent lifestyles and dynamic food environments. Adolescence is a period in the life course in which key habits, preferences and values are shaped as individuals acquire new abilities and capacities and increasingly gain agency (Fox & Timmer, 2020). The interactions between the unique features of this life stage and dynamic and diverse food environments have been understudied (Neufeld et al., 2022). Growing up in times of rapid change, adolescents could be seen as a generation of practitioners that can adopt, reproduce, reshape, de-routinize, or abandon food practices, thereby shifting the ways of shopping, preparing and eating over time that older generations have shaped and taken for granted.

Moreover, how young people experience food in their everyday lives today may shape their visions, expectations and aspirations for the future of food and their own food consumption. In turn, anticipated futures can be performative, shaping practices in the present (Oomen et al., 2021).

Building on an ongoing study on current differentiated daily food practices between adults and adolescents in urban, peri-urban, and rural Northern Vietnam, this research aims to explore how adolescents engage with near and distant food futures in terms of their aspirations and their capabilities in shaping sustainable and healthy food futures within their everyday lives. Shifting the focus from present to future practices we reflect on the design of a participatory futuring methodology suitable for adolescents in these contexts. This research may offer entry points for inclusive and transformative food system interventions benefiting young and future generations. Acknowledgement: This research is part of the Sustainable Healthy Diets through Food Systems Transformation (SHiFT) CGIAR research initiative.

References

Fox, E. L., & Timmer, A. (2020). Children's and adolescents' characteristics and interactions with the food system. *Global Food Security*, 27(November), 100419.

<https://doi.org/10.1016/j.gfs.2020.100419>

Neufeld, L. M., Andrade, E. B., Suleiman, A. B., Barker, M., Beal, T., Blum, L. S., Demmler, K. M., Dogra, S., Hardy-johnson, P., Lahiri, A., Larson, N., Roberto, C. A., Rodríguez-ramírez, S., Sethi, V., & Shamah-levy, T. (2022). Food choice in transition: adolescent autonomy, agency, and the food environment. *The Lancet*, 399, 185–197. [https://doi.org/10.1016/S0140-6736\(21\)01687-1](https://doi.org/10.1016/S0140-6736(21)01687-1)

Oomen, J., Hoffman, J., & Hajer, M. A. (2021). Techniques of futuring: On how imagined futures become socially performative. *European Journal of Social Theory*, 1–19.

<https://doi.org/10.1177/1368431020988826>

Alternative futures of summer comfort: is low-tech more inclusive?

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Experiences and anticipations of global warming are rendering a plethora of responses, also in traditionally moderate climates such as the Netherlands. Sales and use of air-conditioning is booming, resulting in an increase from close to nil, to over 20% of households owning a mechanical cooling device today (Rovers et al. 2021). Accordingly, energy companies are noticing increased energy use during heat waves (Essent 2020).

This turn to artificial cooling in anticipation of increasingly hot weather is exclusionary in various respects. Next to being expensive – in acquisition and use – it is often not allowed for, usually less affluent, tenants to install (affordable) cooling. Moreover, once installed and normalized, cooling is a typical lock-in technology. Research in climates where cooling has been around longer shows that the proliferation of cooling leads to secondary effects that create dependence on cooling. For example because apartments are built with large windows and no shading, siesta's are abandoned, and dressing norms change (Sahakian 2014, Strengers and Maller 2011, Walker et al. 2014). The Netherlands is currently this path towards dependency on cooling (Kuijer 2021), but might still be steered in other directions.

In this talk, I argue that one of the elements fueling technological lock-in is the techno-hedonist persona. The techno-hedonist, introduced in Jensen et al. (2018), and further developed in Dahlgren et al. (2021) is an imagined character that forms the customer and recipient of most domestic technology development. He (most of the time) is an affluent consumer who prefers easy pleasure and personalised environments and, much like the engineers imaging him, expects technologies to solve all problems. This persona is the ideal lead character for neoliberal consumerism, popular with industry, and governments such inclined, but also features as an aspirational figure for consumers.

At the same time the pure techno-hedonist is rare to find. Most participants in my research into Dutch summer comfort practices were willing and able to adjust their expectations, lifestyles and habits to the changing climate (Kuijer 2021). However, technologies for indoor climate focus on offering low-effort solutions directed at maintaining business as usual – i.e. indoor temperatures around 20-22°C year-round.

To challenge this techno-hedonist persona and the narrow, energy intensive and exclusionary futures it invites, I worked with industry and societal partners, and industrial design students to develop a series of sixteen design fictions directed at a radically different type of persona and way of life. Design fictions present materially supported visions of mundane future scenarios that are not meant to develop and sell a new product, but rather to raise questions about alternative futures (Bleeker 2009).

In this project, we piloted a combination of approaches suitable to redirect design activity away from techno-fixes towards low-tech alternatives. In the talk, I use these design fictions to reflect on the potential and limitations of such approaches to foster inclusivity in future everyday life. Are lower-tech futures indeed more inclusive because they are more accessible for less affluent consumers and have a lower chance of technological dependency?

H02: Transitioning towards Sustainable Lifestyles (1/2)

Session Chair: Stefan Wahlen

Room: B: Omnia, R: Quantum 1 (max. 30)

Consumers' exclusion and self-exclusion from sustainable lifestyles: Conceptual and empirical findings

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Achieving sustainable development goals requires changes in consumer lifestyles. This condition has found its empowerment in international agreements and declarations, including Agenda 2030 (SDGs, 2015). The necessity of adopting sustainable lifestyles by individuals and populations has already been discussed by academics (eg. Evans & Abrahamse, 2009; Rogall, 2010; Gilby et al., 2019). But in this paper, we propose to refresh this problem by taking a new perspective. Firstly, we focus on factors and circumstances that hinder or preclude sustainable living. Secondly, we examine shortcomings in adopting a sustainable lifestyle by drawing from the concept of consumer exclusion.

Our main goal is to define and empirically characterize consumers' exclusion from sustainable lifestyles. It entails recognizing the level and manifestations of this phenomenon as well as its determinants considered by consumers in both static and dynamic dimensions. By utilizing the concept of the attitude-behavior gap, we aim to introduce and clarify the conception of self-exclusion from the sustainable lifestyle. Based on the social exclusion literature (Zhou, Huang & Wei, 2017; Zhang et al, 2021), we link self-exclusion solely with psychological drivers to resign a sustainable lifestyle.

To meet the goals of this paper, we start by reviewing the literature on sustainable lifestyles and social exclusion. Then we present selected results of primary research conducted in Poland with the use of a mixed method. These include quantitative data gathered through an online survey on a sample of 1061 respondents and qualitative data from 17 in-depth interviews. The former was conducted in 2021, and the latter at the beginning of 2022.

Our results prove that consumer exclusion is a valuable concept, helpful in understanding and explaining consumers' resistance to change toward a more sustainable lifestyle. From this perspective, exclusion may be described in terms of objective factors stopping consumers from changing their values and everyday activities, a subjective sense of being not involved in a global movement toward more sustainable living, and a personal choice to resist this movement or even act against it. Psychologically driven self-exclusion employs well-known rationalization techniques and stems from a negative perception of sustainable lifestyles. It is also empowered by the effects recognized in consumer boycott research, i.e. small-agent rationalization or free-rider effect. Regarding Polish consumers' attitudes and behaviors, we have noticed relatively high levels of exclusion and self-exclusion from sustainable living. They are determined mainly by the respondents' education and income. Sustainability happens to be criticized by some Poles, and the lack of social reaction to unsustainable behaviors fosters and justifies their self-exclusion. It makes us conclude that the degree of consumers' exclusion from sustainability will not change in

Poland within the next few years and substantiates further research on this topic. The most important practical implication of our work is the necessity of finding better ways of changing Polish consumers' values system and convincing them that sustainability is inevitable and close to their individual choices.

'I Remember a Big Plumb Tree and Sittin' Under There Eatin' all the Plumbs': A Qualitative Interview Analysis of the Stories People Tell About Pathways to Green Living

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This paper draws on two decades of qualitative interviews with green parents and bike commuters, in the Lowcountry region of South Carolina, to ask how green practitioners come to live sustainable lifestyles. The data is analyzed from the perspectives of social practice theory, embodiment, and Siegel and colleague's vision of pro-environmental behavior as a living forest.¹ The results conclude that most practitioners described how their lifestyles grew out of a mix of evolving experiences over long periods of time. Green parents and bike commuters referred to an interwoven patchwork of origins including: efforts to eat and live healthier; a desire to leave a smaller ecological footprint; exposure to role modeling; education, media, travel, and the outdoors; benefitting from infrastructural improvements (like bike paths being installed); wanting to serve as a good role model for community members and future generations; experiencing important moments of change (like having a baby); coping with economic scarcity; wanting convenience; and encountering changes in resources and/or infrastructure, among others. The results point to how advocates and policy makers should avoid moralizing green consumption choices and, instead, focus on people's overlapping, lifelong, joyful and connected pathways to green living. The paper concludes with programmatic/policy recommendations.

¹ Siegel, Lisa, Amy Cutter-Mackenzie-Knowles, and Anne Bellert. 2018. "Still 'Minding the Gap' Sixteen Years Later: (Re)storying Pro-Environmental Behaviour." *Australian Journal of Environmental Education* 34 (2): 189–203. <https://doi.org/10.1017/aee.2018.32>.

Constructive Coping with Climate Change: The Role of Personal Legacy

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Problem Statement: Climate change is undoubtedly one of the biggest threats to human existence. Although the majority of the world's population (72%) now considers climate change a personal threat, the majority (52%) is not confident that we can reduce the effects of climate change. Feelings of hopelessness and helplessness—and ultimately despair—about climate change could ultimately undermine efforts to prevent further environmental destruction.

Research Questions: Research suggests that building a lasting legacy can not only spur people into collective and proenvironmental action, but that it can also help them deal with the (existential and physical) stressors imposed by climate change on individuals' mental health. To that end we hypothesized that those who report being more concerned about their legacy will express greater climate change anxiety and concern about climate change, while also expressing hope about the future, individual and collective efficacy, as well as more constructive ways of coping with the threat of climate change (i.e., engaging in proenvironmental action rather than expressing hopelessness).

Theoretical approach: To examine this research question we integrated literatures on climate change anxiety, personal legacy and generativity, as well as risk perception. Our goal was to understand how all this psychological processes influence individuals appraisals of climate change as an issues that can/cannot be solved.

Methods: We conducted several cross-sectional studies in the United States and in countries in the Global South via CloudResearch and Toloka (respectively), two platforms that allow online data collection from participants. For all studies participants provided self-reports on all measures of interest.

Findings: Across 4 studies in the USA (N = 1287) and one cross-national study (N = 223) we find that individuals who report greater concern in their personal legacy also report better mood, more meaning in their lives (Studies 1-2), more climate change anxiety (Studies 3-5), but also more hope about the future (Studies 4-5), and more constructive coping with climate change (Studies 3-5). Further, these individuals also perceived more mundane activities as legacy-building opportunities, and perceived such efforts as more effective. Finally, these individuals also engaged in proenvironmental behaviors to a greater degree (in behavioral paradigms; Studies 3-5).

Conclusions: Our correlational results suggest that caring about one's legacy could be an effective strategy to increase engagement in sustainability efforts. Aside from this benefit, personal legacy concerns also relate to better mental health outcomes within the context of climate change.

Practical and Scientific Implications: Although further experimental work is required to establish a cause-and-effect relationship, at a first glance it seems that those who are concerned about their personal legacies are also those who are more likely to engage in proenvironmental behaviors, report better mental health outcomes, and deal with the impending threat of climate change in a constructive way (i.e., appraise as a tangible threat, but not lose hope as a result).

The everyday ecological practices of climate protesters in Italy

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The policies of empowering citizens against the climate crisis through individual anti-carbon and anti-waste practices have been strongly criticised by the climate movement that emerged in 2018, after the student strikes. However, activists have not renounced to adopt these ecological practices in their daily lives. This article aims to understand what socio-demographic and value determinants lead climate protesters to engage in everyday ecological practices. Secondly, it aims to understand what justifications are offered by protesters for engaging in such practices. The article seeks to move beyond classical theories of political consumerism that tend to view ecological practices as individualised forms of action aimed at transforming the market and society in a normative manner. It attempts to inscribe the adoption of such practices within the framework of critical sociology, also mobilising some of the theoretical tools of critical consumption. The article is based on a mixed quantitative-qualitative methodology. Specifically, five surveys were administered during five separate climate mobilisations in Italy between September 2021 and March 2022. Overall, more than 1,000 questionnaires were collected. The survey contained questions on the socio-demographic and socio-economic profile of the protesters, their daily ecological practices, their collective commitment and their political orientation. In addition, 25 in-depth interviews were conducted with Italian climate protesters who participated in the survey. The article will show that particular social characteristics (gender, age, class) and value orientations (political radicalism, concern about the imminence of the climate crisis) tend to result in a stronger adoption of everyday ecological practices by protesters. Secondly, it will identify different profiles of protesters on the basis of their motivations for adopting ecological practices in their lives: those who consider such practices as strategic and effective in solving the climate crisis, those who adopt them out of ethical imperatives, those who get prepared to adapt to a catastrophic future, those who seek spaces of resistance to market society from a sustainable materialist perspective. The article mainly contributes to the literature on social movements and sustainable consumption. It provides some innovative tools for profiling climate activists based on their consumption choices and aims to produce a reflection on the role and meanings of ecological practices even when they are considered insufficient for the ecological transition.

H03: Life Cycle Assessments

Session Chair: Rebeka Kovačič Lukman

Room: B: Omnia, R: Momentum 3 (max. 30)

Do short food supply chains have lower true cost? The case of bread.

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Starting from the Green Revolution, modern large-scale food production has been focusing on increasing the yield per hectare at all costs, to deliver sufficient cheap food for a growing population (Ambikapathi et al., 2022). However, consensus is growing on the fact this setup has pushed farm-gate prices down and externalised unsustainable environmental and social costs (Marsden et al., 2018). Hence, negative externalities of the production process are not reflected in food market prices and not borne by the polluters (Michalke et al., 2022).

In contrast, many authors are advocating for shorter, small-scale chains (Wang et al., 2022) which shift from focusing primarily on yields towards ecological well-being, and a higher internalization of production externalities. This often results in higher costs of production, which tend to make their products less competitive in the market (Dansero et al., 2020).

The emerging question is: if the environmental costs of food production in conventional and short supply chains are made visible, which one better minimizes the gap between the market price of food and its comprehensive cost to society?

The monetary valuation of impacts is an opportunity to include externalities in the resource allocation decisions of our economic system (Ponsioen et al., 2020) and regulate the market functioning accordingly (Aspenson, 2020). As a consequence, True Cost Accounting (TCA) methodologies have been advanced by scientists to close the gap between market prices and the true cost of food by measuring and costing externalities (Baker et al., 2020; de Adelhart Toorop et al., 2021). Still, in-depth studies on the application of these methodologies are scarce (Hendriks et al., 2021).

This paper implements TCA to compare the true cost of bread from short and conventional food supply chains. Bread is chosen due to its role as one of the most important staple foods in Europe - with an average yearly per capita consumption of 50 kg - and worldwide and embodies a unique cultural heritage (Notarnicola et al., 2017). Negative environmental externalities are quantified through a cradle-to-grave Life Cycle Assessment conducted on a short and a long supply chain. Then, we monetize the resulting negative environmental impacts through the abatement approach.

Our study provides results that quantify and compare the true costs across the two different supply chains of one core staple food of Europe.

For guiding and speeding up the sustainability transition of the global food system, negative externalities of food production, processing and trade need to be quantified and valued.

Such knowledge will provide scientists with science-based reference values and benchmarks for the most important externalities in food products. The study will also support decision-making in

defining a corrected price mechanism based on the integration of externalities, that when combined with public funding mechanisms, may encourage producers and processors to produce food in a more sustainable way.

Lifecycle assessment of fresh food production and distribution towards sustainable food supply chains: a case study of Japan

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To achieve a sustainable food supply chain, not only the change of consumers' attitudes but also the infrastructure and institutions that facilitate such individuals' actions are vital (Spaargaren, 2011). Although food distribution damages the environment, there has been little discussion about the role of supply chain intermediaries, such as logistics service providers, wholesalers and food hubs (Hingley et al., 2015; Zhu et al., 2018). In addition, the environmental impact should not be limited to greenhouse gas (GHG) emissions but also encompass various aspects such as water use (Garnett, 2011).

Previous research to compare the environmental impacts of different food supply chains has been established in the production phase, such as organic and conventional farming systems (Tuomisto et al., 2012), and the distribution phase, such as transportation (Frankowska et al., 2019; Sim et al., 2007) and packaging (Singh et al., 2006; Tasca et al., 2017). However, very little is known about which combination of production and transportation phases may influence losses at the distribution stage, resulting the higher environmental impacts per product unit. While Porter et al. (2018) investigated the food losses in the fresh food supply chain, they focused only on GHG emissions, and their effect on water use is not yet clear.

This study aims to conduct a lifecycle assessment of fresh vegetables to evaluate GHG emissions and water use, considering the food losses and quality changes at the production and distribution stages. Our result reveals that organic fresh vegetables have lower GHG emissions per unit area but higher per product unit, considering the distribution efficiency and the food losses. It also indicated that water use depends on the production area and cultivation method and varies with transportation distance. These research results support the idea that self-sufficiency in food is essential from the environmental aspect. To conclude, we discuss the need to investigate the societal and economic infrastructure and institutions, as well as the environmental, towards the sustainable food supply chain.

Life-cycle assessment of tomato packaging: A case study from Slovenia

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Industrialization and the rise of consumerism made packaging one of the essential components of selling products. Packaging enables mechanical protection, protection from a change in structure, and easier goods handling. Previous research on packaging shows its negative impact on environment. Our study represents an environmental evaluation of tomato packaging available for consumers at Slovenian supermarkets. We have evaluated four different plastic packaging: polypropylene film, a polypropylene bag combined with a cardboard box made of corrugated recycled paper, a plain low-density polyethylene plastic bag, and a recycled polyethylene terephthalate box. We have used OpenLCA software and CML – Centrum voor Milieukunde Leiden's impact assessment method for the life-cycle assessment. The results show that both the production process of plastic packaging and the production process of a cardboard box have the most significant environmental impacts. When considering the entire life cycle, the polyethylene terephthalate box presents the least favorable packaging choice for tomatoes from an environmental perspective. Compared to other selected packaging, it has more pronounced impact on most environmental indicators. Low-density polyethylene and polypropylene bags represent less threat to the environment than composite packaging made of polypropylene film and cardboard boxes. However, all four various tomato packaging in Slovenian markets introduced the most significant environmental impacts in category of global warming potential.

Providing environmental performance information for consumer products through environmental ratings: the impact of methodological choices

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The importance of information provision in helping individuals and society move towards more sustainable lifestyles is captured in target 12.8 of the Sustainable Development Goals. Consumers themselves are increasingly looking for greater clarity on the environmental performance of the products they purchase, and point to the lack of information as one of the main barriers to living more sustainably. Policy makers throughout the UK and the EU, at a national or regional level, are taking initiatives to combat misleading green claims and develop structured frameworks to provide information in a fair and harmonised way. In this context, life cycle assessment (LCA) is the prevailing approach to quantify product environmental footprints. Translating product LCA results into a single rating for streamlined communication to consumers is an emerging phenomenon, with LCA-based environmental rating ecolabels (ERE) multiplying rapidly throughout Europe in recent years. There is an urgent need to harmonise the underpinning methodologies of these ecolabelling schemes, helping to promote evidence-based and credible consumer information. Consolidation efforts need to ensure relevance, scientific robustness, transparency, and scalability of the labels, to adequately inform consumption choices.

This presentation introduces the first analysis of the strengths and weaknesses of the existing landscape of ERE in Europe through that lens, and establishes the need for collaborative development of technical recommendations at sector level to harmonise methodologies. The research focus is further placed on revealing the impact of methodological choices made outside the LCA framework. Necessary to derive a final rating from LCA results and place products on an appropriate scale for effective comparison by consumers, the nature of these steps is of fundamental importance for the resulting quality and consumer relevance of the product ratings. Our analysis therefore focuses on how products are assigned to categories, how the extremities of the rating scale are defined, and how this scale is divided into segments to allocate a rating to each product. Using the food sector as a case study, several options for product categorisation are investigated, based on a review of existing categorisation schemes. A food products database containing GHG footprints for over 2,500 items is used to explore categorisation options and how these could promote or hinder product comparisons. Finally, several rating scale parameters are considered in terms of their influence on final product ratings. Preliminary results show product category selection and design of the rating scale used to derive final environmental ratings have a profound influence on the relative ranking of the products considered. Hence, this work concludes with a discussion on the critical methodological

components in the development and harmonisation of robust, relevant and reliable ecolabels intended to inform more sustainable consumption choices.

H04: Industrial Symbiosis & Circular Business Parks

Session Chair: Jaco Quist

Room: B: Omnia, R: Quantum 2 (max. 30)

Industrial Symbiosis Skills Assessment Tool

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Industrial symbiosis could be defined as the use by one company or sector of underutilised resources broadly defined (including waste, by-products, residues, energy, water, logistics, capacity, expertise, equipment and materials) from another, with the result of keeping resources in productive use for longer (CEN/WS 093 - Industrial Symbiosis)

Workers in the process industries today are not trained in industrial symbiosis, or circular economy thinking, and many will have experience deriving primarily from a single industry. Going outside their sector, and their traditional supply chain, is not usual for many companies, however, industrial symbiosis initiatives generally involve transactions between different industry sectors.

This paper introduces Industrial Symbiosis Skills Assessment Tool developed within the European Project Spire-Sais. This tool allows the workers related to Industrial Symbiosis (IS) to assess their knowledge on IS and to prioritise the training needs according to their job profile and to access to the training offer available by the SPIRE-SAIS training platform.

The development of the methodology underpinning this tool consists of five stages:

- Identification of existing job profiles in the cement, minerals, water, ceramics, steel and chemical industries that had some task related to the management and/or implementation of IS.
- Description of the skills needed to carry out the different IS tasks within the companies. Those were determined on the basis of an extensive bibliographical review and interviews with companies in all sectors.
- Identification of the topics and knowledge necessary to acquire these skills.
- Mapping of the training needs for each skill, according to the gap identified between the level of preparation required for each topic and job profile and that declared by users
- Allocation of existing courses and training content developed by Spire-Sais project for each topic and for each skill.

The innovation of this tool lies in the design of its process and content. A support tool is made available to the different workers and companies to help them measure IS competences, organise the necessary training according to the training gaps of the workers and the needs according to the job profiles and industrial sector. In addition, this tool will be linked to a much broader platform where all existing courses on industrial symbiosis, circular economy and sustainability will be centralised and aligned with EQAVET (European Quality Assurance in Vocational Education and Training).

The present study was conducted with the support of Erasmus+ Call: Sector Skills Alliances (Lot 3) Project Number/Agreement Number: 612429-EPP-1-2019-1-DEEPPKA2-SSA-B “Skills Alliance for Industrial Symbiosis - A Cross-Sectoral Blueprint for a Sustainable Process Industry (SPIRE-SAIS)”.

Boosting Industrial Symbiosis Practices in Industrial Parks Located in Spain

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Industrial symbiosis could be defined as the sharing of resources within the same company, between companies and across sector, with the aim of keeping resources in productive use for longer. Application of industrial symbiosis allows materials to be used in a more sustainable way and contributes to the creation of a circular economy. The transition to such an economy is the goal of the European Commission's Circular Economy Action Plan as it will result in the increase of Europe's economic competitiveness, sustainability, resource efficiency and resource security. It also contributes to the reduction of greenhouse gas emissions (GHG).

This paper presents the methodology developed and applied to promote and identify potential synergies among the industries located in one of the industrial sites in the Municipality of Onda (Valencia region, Spain). To this end, the tasks performed were carried out with the support of Onda Townhall and the Management and Modernisation Entity of Sur-13 (EGM Sur-13 in Spanish).

The tasks carried out are as follows:

- Mapping of economic activities in the target industrial site.
- Mapping of the resources (demand and offer). This mapping was carried out for the identified economic activities. For this purpose, a series of interviews were conducted with the managers of each company to detect offer and demand of underutilised resources (including waste, by-products, residues, energy, water, logistics, capacity, expertise, equipment and materials) and to gain a better understanding of their needs.
- Data treatment. After conducting all the interviews, the detection of possible synergies was identified. A synergy is defined as the combined power, profits, etc. that can be achieved by two organizations or groups of people working together rather than separately.

The outcomes of this work were:

- The development of a cooperative model that enables economic, environmental and social benefits extended beyond the sphere of influence of a single company.
- More opportunities for synergies were found related to logistics resources and services rather than material and energy resources.
- Limitations and opportunities found by applying this methodology in an industrial site of these characteristics, that will be presented in the conclusions.

The present study was conducted through the CIRCER project, funded by the Autonomous Government of Valencia through the Valencian Institute for Business Competitiveness (IVACE) under project IMAMCA/2022/1.

Progress in Eco-Industrial and Circular Business Parks: Updated framework and cases from the Netherlands

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To transition to a circular economy, eco-industrial parks (EIPs) and Circular Business Parks (CBP) are needed. However, developing EIPs and CBPs is complicated. Nevertheless, some EIPs that are successful with industrial symbiosis and utility sharing activities happening. For instance, there are only few case on EIPs and CBPs in the Netherlands reported. Therefore, the progress on EIP and emergence of CBP in the Netherlands is addressed in this paper asking: "How to facilitate the implementation of industrial symbiosis and utility sharing activities in EIPs in the Netherlands? To answer this question, the factors for the success of industrial symbiosis and utility sharing in EIPs were identified through the literature review to update the framework of Eilering & Vermeulen (2004). Three new factors were added, leading to ten factors important to implement industrial symbiosis and utility sharing when developing an EIP or CBP. The factors are: (1) vision and ambition, (2) location-specific physical features, (3) location-social specific features, (4) business-specific features, (5) proposed measures, (6) organisation of decision-making, (7) policy instruments, (8) economic features, (9) external context, and (10) serendipity.

The refined framework was applied to three successful parks in terms of industrial symbiosis and utility sharing: InnoFase in Duiven, Industrial Park Kleefse Waard in Arnhem, and Biopark Terneuzen in Zeeland. Data collection took place via semi-structured interviews with respondents for each case study. Findings show that industrial symbiosis and utility sharing activities could be identified at all three parks. InnoFase is engaged in many industrial symbiosis activities by exchanging different types of flows such as biomass, biogas, water, electricity and heat, while other synergies are ;under development. At IPKW mainly utility sharing activities were found, including a gas-fired power plant fed by the on-site wastewater treatment plant. Other smaller flow exchange activities include plastic, biomass, and wood reuse by some of the companies. The case of Biopark Terneuzen revealed that the exchange of flows ass typically used in the literature is not accurate because some intended exchanges never materialized. A cross-case analysis was conducted to identify what sub-factors or barriers were present in every case. In total, 63 sub-factors could be identified that influenced the success of the park. It appears that social innovation is key to implementing industrial symbiosis and utility sharing.

Carbon neutrality toolkit application to eco-industrial park (EIP): a comparative study on China, Japan and Korea national EIP programme

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Eco-industrial park (EIP) is important approach to practice circular economy and realize sustainability consumption and production in park and regional level. It is also novel practice of circular business model via optimizing the resources utilization and minimizing the waste generations in the life cycles. In the new era of carbon neutrality, it requires to answer two questions: 1) how the emerging carbon neutrality toolkit could be applied to boost the EIP practices, such as the combination of climate risk disclosure and corporate environmental-social-governance (ESG). 2) how the improved EIP performance will contribute to carbon neutrality. Two answer the two questions, this study conducted two parts' work: first of all, toolkit was designed based on the policy mechanism on supporting the carbon neutrality. We categorized the policy toolkit into six categories: a. Regulatory Reform, b. Market-based Mechanisms, c. Commercialization mechanism, d. Financial/Fiscal mechanisms, e. Governance mechanisms, and f. Direct Investment, and, analysed how they could be applied in EIP and improve the corporates performance on circular economy and carbon mitigation, based on the Porter hypothesis and the first-mover advantage theory. Secondly, we analyzed do the EIP and corporates' efforts will in return contribute to regional carbon neutrality & SDG target?, with application of The difference in difference (DID) model and qualitative analysis. Based on these, comparative study was conducted in China, Japan and Korea, where had initiated both national EIP programme and committed carbon neutrality target. Our findings highlighted the developed toolbox had high potential to improve the EIP's performance on carbon neutrality, and, enhanced their productivity. Meanwhile, these effects were varied in different political and market economic context. Hence it required a mix design and implementation scheme. Our results expect to offer policy support and help to design novel business model, to local and regional industrial symbiosis and EIP practice in the context of carbon neutrality strategy.

H05: Everyday Circularities: Rethinking Consumption in the Circular Economy (1/3)

Session Chair: Mary Greene, Kersty Hobson

Room: B: Omnia, R: Auditorium (max. 108)

Bringing the circular economy home – Insights from socio-technical perspectives on everyday consumption

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Transitions toward a circular economy require a nuanced understanding of how change plays out in households in relation to the role of consumers and daily consumption practices. However, little has been said about the complexities of achieving necessary transformations in everyday cultures of consumption and the possible challenges faced by householders in achieving a circular economy. Responding to this gap, we develop an agenda for attending to the social embeddedness and complexity of consumption in the circular economy. This agenda includes several critical elements that attend to routine, habitual and mundane aspects of social life, and the institutional-material arrangements and systems of provision that shape how and why consumers use services and products in daily practices. In discussing these elements, we outline research gaps and recommendations for future circular economy inquiry that better appreciates the social dynamics of everyday life.

Configurations and commonalities of circular consumption practices in Australia

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The transition to a circular economy requires significant change at all stages of the economy (Maitre-Ekern & Dalhammar, 2019). The role of consumption practices has traditionally been under-researched, and only recently begun to receive attention (Chamberlin, 2018; Selvefors et al, 2019; Maitre-Ekern & Dalhammar, 2019; Garcia et al, 2021; Gomes et al, 2022). The majority of this consumer-focused research has primarily been concerned with identifying factors that enable or hinder consumer engagement with specific circular business models, of which the most commonly-studied factors are product characteristics and price, and consumer environmental concern and attitudes (Gomes et al, 2022).

However, truly understanding circular consumption practices requires shifting from understanding people as passive 'acceptors' of new business models (Hobson, 2021) or 'users' of more circular products or services, to 'doers' of everyday activities (Mylan et al, 2016). This involves comprehensive consideration of existing socio-cultural systems (Spaargaren, 2013), and exploration of the intricacies of dynamic practices (Mylan, 2015).

An emerging body of research is beginning to look at consumer engagement in the circular economy more holistically through the concept of adoption and routinisation of practices in the everyday life of households (Rabiu & Jaeger-Erben, 2022). Yet most practice-based approaches currently conceptualise and explore practices in isolation. A more holistic conceptualisation as a nexus of practice and material arrangements would provide a better overall picture of the conditions/requirements for adoption of circular consumption practices (Rabiu & Jaeger-Erben, 2022).

This study therefore presents the results of a multi-stakeholder, participatory process to identify the configurations of personal, social and material elements (Sahakian & Wilhite, 2014; Retamal, 2019) that are currently present in eight practices of circular acquisition, use, retainment and divestment (Glover, 2012) in Australia. We use the results to explore interlinkages and commonalities across these eight practices, as well as linkages with broader design, production and distribution practices.

We then reflect on how the current configuration of personal, social and material elements may be slowing the adoption of circular consumption practices in Australia and elsewhere, and conclude with ideas on where/how to intervene to transform practices (Keller et al, 2022) to speed up the transition to a circular economy.

Applying '4 lens' to a roadmap of everyday 'responsible consumption' behaviours in the circular economy

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An important consequence of the lack of attention to everyday life in sustainability transformations are blind spots in our understanding of how different actors in the system enable and constrain possibilities of everyday living. It is true that behaviour change based approaches are too often directed at the least powerful and focus on optimising existing systems, rather than transformational change. But what if we tackle the 'hard' behaviours, and turn the same analytical lens and toolkit on decision makers and actors such as manufacturers and designers, and retailers as well in the system? In this paper we apply '4 lens' on behaviour in transitions (Kaufman et al. 2021) to a multi-stage roadmap of key responsible consumption behaviour changes in everyday life. Responsible consumption refers to changed natures and qualities of consumption, as well as absolute amounts. The roadmap was generated by practitioners, subject matter experts and researchers identifying, prioritising and analysing key behaviour changes to advance responsible consumption. It maps the 'consumption work' of behaviours across key product and material lifecycle stages, distinguishes between 'end point' and enabling behaviours in households and beyond, and tracks some key temporal and stakeholder dependencies. In doing so, we generate practical and theoretical pathways to transforming the intersection of everyday life and the circular economy.

From a practical perspective, articulating "who could do what differently", "why they do what they do" and "what might work to encourage change" across the system, facilitates practical roadmaps of change can be shared and build coalitions of action.

Theoretically, systems analyses indicate that complex emergent properties emerge from simple behaviours in a system. Mindsets and paradigms around time, mobility and cultural capital and other 'higher order' leverage points are examples of such emergent properties - they are variously adaptive and maladaptive aspects of the co-evolution of internal and external experiences of the biophysical and socio-technical context. Like practice perspectives, we agree that empirical and focused attention can usefully be directed to understanding how different scales of internal, interpersonal and broader socio-technical systems influence different actors, individually, and linked in systems. That noted, we suggest that deconstructing and potentially influencing such properties, particularly when they relate to physical, environmentally significant behaviour, requires fine grained and methodical analysis across multiple scales that attempts to avoid reifying practices and other theoretically identified constructs.

In doing so, we aim to provide a complementary perspective on practices in everyday life from a systems orientated behavioural public policy frame. While acknowledging that practices and behavioural science approaches may have serious ontological and epistemological disagreements, a complementary approach takes us closer to the ideal of transdisciplinary research and applying all relevant perspectives towards achieving system transformation.

References:

Kaufman, S., Saeri, A., Raven, R., Malekpour, S., Smith, L., 2021. Behaviour in sustainability transitions: A mixed methods literature review. *Environmental Innovation and Societal Transitions* 40, 586–608. <https://doi.org/10.1016/j.eist.2021.10.010>

Households and churn in the circular economy

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Product longevity is one of the most vexed issues in emerging Circular Economy initiatives as it is antithetical to prevailing corporate business models. Yet there are many ways in which the lifespans of products and materials are currently extended within and between households, including through practices of repair, maintenance, gifting and second-hand transactions. These activities may all be regarded as forms of 'consumption work' that may be critical for the realisation of the Circular Economy but which, like other forms of domestic work, lack visibility and the attribution of value (Hobson et al. 2021). Korsunova et al. (2021) argue the need for better understanding of potential roles of citizens as enablers of Circular Economy and citizen-level perspectives on Circular Economy. In this context, the household as a site of material churn or retention warrants closer examination to better understand these practices. We report on findings of a survey of 2717 households across Australia in which residents were asked about their practices of sharing, maintaining and repairing three types of products: (i) appliances and whitegoods, (ii) furniture and homewares, and (iii) clothing and accessories. A cluster analysis provides some insights into the socio-demographic profiles of households most and least likely to promote product longevity for the different product types. We conclude with some reflections on the significance of material churn in households for the temporality of the circular economy.

Korsunova, A., Horn, S., & Vainio, A. (2021). Understanding circular economy in everyday life: Perceptions of young adults in the finnish context. *Sustainable Production and Consumption*, 26, 759-769. doi:<https://doi.org/10.1016/j.spc.2020.12.038>

Hobson, K., Holmes, H., Welch, D., Wheeler, K., & Wieser, H. (2021). Consumption Work in the circular economy: A research agenda. *Journal of Cleaner Production*, 321, 128969. doi:<https://doi.org/10.1016/j.jclepro.2021.128969>

Thinking out of the box - a sociological perspective on reusing

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Reusable food containers like bowls, cups and boxes are key for reducing waste from single-use packaging. While the market for suppliers is growing and new policies are being introduced to support the provision of reusable food boxes, no routines have yet been formed on the part of consumers – they state, for example, that they often forget to bring the containers with them when going shopping (Kröger et al. 2020). Drawing on concepts from cultural sociology, this paper defines consumption of food packaging as a process whereby agents engage in appropriation and appreciation of goods (Warde 2005). It is not only related to discarding, but also to activities such as acquiring and appropriating things, storing, holding on to them, and sorting through them (Gregson 2007; Müller and Süßbauer 2022). While some studies on the reuse of disposable packaging exist (Shipton 2007; Shipton and Fisher 2010; Pandey et al. 2018), little sociological research has yet been undertaken on reusable packaging. One exception is the study by Vaughan et al. (2007) on refillable glass milk bottles in the UK showing that reuse involves reciprocal relations of care and trust, because the object remains constituted in the transition from one episode of use to another. To close this research gap, this paper aims at understanding practices of transporting, cleaning, and storing reusable containers in the consumers' homes and out of home.

This paper presents qualitative findings from an intervention study with 100 Berlin households on packaging waste reduction in May and November 2021. Approximately one third of the participants were asked to document their everyday experiences related to reusable food containers in a workbook. The workbook contained a mix of tasks including taking pictures, interviewing friends, doing mind maps and documenting 'everyday challenges' with food boxes. Furthermore, participants were interviewed individually in the beginning and the end of the study and participated in a group discussion with other households. The data is analysed by alternating inductive, deductive and abductive qualitative coding. Preliminary findings are that practices of storing, cleaning and transporting reusable food boxes are quite diverse and informal among participants depending on spatial, time-related and material factors: the general storage organisation within households (e.g. if boxes have a certain place in the home), cleaning organisation outside the home (e.g. at the workplace), the rhythm of the day (e.g. similar sequences vs. unstructured) and object relations (e.g. emotional attachment to the container). Preliminary results show that reusing is a completely different practice than (re)using disposable packaging. Reusable packaging not only interacts with the consumers' dwelling infrastructure (Gregson 2007), but also requires an alignment with other everyday objects (like the backpack or bike) as well as a restructuring of everyday temporalities and household organisation. These everyday aspects of reusing on the part of consumers need to be considered by start-up's, local authorities and designers if reusable packaging systems are to be normalised in the future.

H06: Circular Textiles

Session Chair: Frieder Rubik

Room: B: Omnia, R: Momentum 2 (max. 30)

Education for sustainable fashion

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The fashion & textile industry is the second-largest polluter in the world. Boosting the sustainability of the sector and addressing the challenges brought about by the COVID-19 crisis are among the EU-wide concerns, in which the stakes in terms of cross-border pollution effects and impact on the internal market are high. The changes proposed by the new EU Textiles Directive will be enforced starting next year, pressing businesses in the textile sector to change their operations and products. However, since the changes required are drastic, many businesses will be affected due to the lack of specialized education and preparation, especially in small and medium-sized enterprises. In order to comply with the new legal and market demands, businesses will have to train their employees in sustainable fashion and textiles, with specialized training that involves high costs, endangering the small business world, which may not have residual funds for such training. The research focused on two aspects: the legal framework concerning environmental sustainability, recycling, and circular economy in the fashion and textiles industries and the main educational strategies and the main existing vocational education and training and academic educational offers in the mentioned fields. The research allowed the identification of both legislative and educational gaps at the national and European levels, thus helping the project consortium elaborate tailored and effective training solutions to fill them, making it possible for project partners to define the necessary knowledge, competencies, and skills that need to be developed in order to build capacity for professionals in the fashion sector to cope with the current market conditions and requests.

The sustainability commitment of Made in Italy: a deep dive into the fashion industry sector.

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Problem statement: Fashion companies are increasingly developing and marketing eco-fashion to promote sustainable consumption (Joergens, 2006; Fletcher, 2008; Chan and Wong, 2012). This new trend has been adopted not only by luxury but also by high and fast fashion brands (De Angelis et al., 2017; Kapferer and Michaut-Denizeau, 2017; Torelli et al., 2012). As claimed by Kotler (2011), an emergent group of consumers considers sustainability as a key criterion in their consumption choice (the “Lifestyles of Health and Sustainability” - LOHAS market segment). This is prompting fashion companies to develop new business models focused not only on profits but also on social and environmental sustainability. However, caution should be taken when considering these behaviors, which may simply be a form of greenwashing to attract conscious consumers (Blasi et al., 2020). Careful attention should be paid to real sustainability engagement, which is verifiable, for instance, through certifications.

Research questions/aim: This work aims to analyze the social and environmental sustainability commitment of companies operating in the fashion industry in Italy. The objective is to answer the following research questions: 1) Do fashion companies operating in Italy commit to sustainability? If so, to what extent? 2) Can we differentiate between soft (mainly greenwashing) and strong (actions and certifications) sustainability commitment? Is there any difference in the commitment toward social and environmental sustainability?

Theoretical approach: Our theoretical framework is based on a systematic literature review on the relationship between fashion and sustainability. We analysed 574 documents available in Scopus from 2007 to 2022. The results of the bibliometric analysis allowed us to identify the thematic evolution of the field, which moved the focus from consumption to production, finally targeting very important issues such as the sustainability of the supply chain and the adoption of circular economy practices.

Methods/inquiry approach: We used data mining techniques applied to data collected from the websites of all the fashion companies located in Italy and registered in the AIDA Bureau van Dijk database. Data was obtained using Qiba (Quantitas Intelligent Business Analyzer), a web crawling and scraping tool. We adopted a novel content analysis method, which relies on the TF-IDF weighting scheme proposed by Paik (2013).

Preliminary findings: Results reveal the existence of a trend towards a strong sustainability engagement, which goes beyond greenwashing. The more companies agree on sustainability principles, the more they also implement concrete actions, and the more they officialize their actions in obtaining sustainability certifications.

Conclusions: practical and scientific implications: From a managerial standpoint, this study presents interesting implications for fashion companies looking to increase the effectiveness of their environmental and social sustainability initiatives. The analysis identifies clusters of sustainability actions that work as important benchmarks for companies operating in the sector. From a scientific standpoint, this study offers the first attempt to provide a complete literature review on the topic and quantify the sustainability orientation of fashion companies using original webscraping methodologies and content analysis.

On the path to a circular textile economy

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Presenter: Frieder Rubik, frieder.rubik@ioew.de (in person)

More and more textiles are being produced around the world – with serious consequences for the environment. The project to be presented (DiTex) tested the feasibility of a circular economy for the textile industry in the business customer segment. DiTex aimed to test how this segment can be used for the textile cycle, to develop these structures further and assess the environmental potential of approaches to a circular economy.

DiTex selected five key approaches (high level of recycled content, use of durable components to extend life cycle, a “smart label” as a digital tracking solution, testing of circular business models and chemical fibre-to-fibre recycling at end-of-life) with the goal of narrowing, slowing down and closing material cycles, thereby reducing the impact on the environment and resources. Supplementary approaches included eco-efficiency, certification and the development of new business relationships with recyclers. These goals were pursued in a work programme consisting of conceptual, empirical and evaluative components, which ultimately led to a comprehensive analysis. The core element was a field trial: a polo shirt for emergency medical services (100% polyester rPES), a police business shirt (62% certifiably organic cotton/38% polyester rPES) and a bed linen set (50% lyocell, regenerated cellulose/50% polyester rPES) were used and evaluated by users between summer 2021 and spring 2022. The textiles were provided by a textile service, picked up and laundered. Textile and use data was tracked digitally. Extensive tests were conducted during and after the field trial.

- Spectrophotometric measurements tracked the physical properties (including morphology, colour) and the chemical composition over the course of use.
- The DiTex textiles were subject to different textile tests (including mechanical properties, care properties for laundering, physiology) to determine whether they met the Hohenstein quality standards.
- In (screening) life cycle assessments, the environmental impacts and resource efficiency of the standard textiles were compared with the DiTex textiles, and sensitivity analyses were compiled.
- The experiences of the users of DiTex textiles, the textile service providers (laundries) and the test user institutions were evaluated in interviews and through surveys.

The presentation will focus in the main results, highlight measures of transfer and present some strategic conclusion for transmission of commercially used textiles.

Addressing the Gaps in the Circular Fashion Model from a Global North / Global South perspective

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Presenter: Gülşah Yılan, gulsah.yilan@unitelmasapienza.it (in person)

Recently, the fashion sector has been a centre of attention due to the sustainability issues associated with it. Specifically, the rise of fast fashion has increased the demand and shortened the life span of garments. Consequently, better practices are required to achieve a more sustainable and circular fashion sector. Circular economy (CE) emerges as an alternative model to promote the reduction of environmental impacts through preserving the value of materials either by extending the life of products or by reintegrating them into the system. To promote circularity in the fashion sector, many strategies have been developed to reduce the impacts throughout the life cycle of clothing items. However, less attention has been given to the end-of-life stage, particularly from a global perspective. Through the analysis of global material trajectories, some issues linked to the second-hand clothing (SHC) trade in terms of both content and geographical location are observed. Generally, Global North (GN) countries “trash” their waste to the Global South (GS) causing environmental degradation and exposing people to environmental and health risks, starting a debate on global environmental injustice. The SHC sector is an important case that reflects these asymmetries between the GN/GS countries. Specifically, African countries receive more than 30% of used garments globally, which makes them one of the leading importers of SHC items. Even if the international SHC trade was perceived as an effective strategy to promote the circularity of the fashion sector, many sustainability concerns still prevail including environmental, ethical, economic, and social impacts.

Against this background, this paper analyses circularity gaps in the fashion sector by employing a combined SWOT/ANP method. The aim of this study is twofold: to cover the complexity of the SHC waste trade from a global view, and to signal the different perceptions of the problem from a GN/GS perspective. Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis can aid organizations in building strategies upon their strengths, eliminating their weaknesses, exploiting their opportunities, or even using them to counter threats. The use of a hybrid method combining SWOT analysis with Analytical Network Process (ANP) allows for depicting the complex interrelationships among decision levels and attributes. To apply the ANP to matrix operations to determine the overall priorities of the alternative strategies identified with SWOT analysis, we used an 8-step algorithm; including the identification of SWOT sub-factors and alternative strategies, the determination of interdependent priorities and importance degrees, and the calculation of the overall priorities of the alternative strategies to indicate the best one. To reflect the plurality of perspectives in GN/GS, key stakeholders from different regions were invited to participate in the evaluation process. Identified strategies upon combined SWOT/ANP analysis allowed us to demonstrate the divergence of perceptions and priorities between the GN/GS stakeholders. The divergence is presumably linked to the background and context of the experts interviewed, reflecting the complexity of achieving a global consensus in a circular fashion model that aims to embrace global environmental justice principles.

H08: Circular Economies, Materials and Production

Session Chair: Oana Iliescu

Room: B: Omnia, R: Podium (max. 269)

Biosolids to biochar: An overview of biochar production and applications in the urban environment

Oana Iliescu, Aalto University, Espoo, Finland, oana.iliescu@aalto.fi

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Presenter: Oana Iliescu, oana.iliescu@aalto.fi (in person)

Biochar, as one of the most prominent carbon drawdown technologies to emerge over the past few years, is intensely researched and tested. By no means a new creation, biochar has a rich history as a soil amendment in agriculture across the globe. However, the interest it raises now focuses more on its carbon sequestration potential and beneficial applications in the urban environment.

This study offers an overview of the material, a literature review of its physical and chemical properties, production technologies, and uses in the urban context. It concentrates on biochar as a component in manufactured soils, water filtering systems, contaminated soil remediation methods, and construction material additives. Additionally, it investigates sewage sludge as an innovative feedstock for biochar production. Sewage sludge disposal is both environmentally and economically costly for wastewater treatment facilities and biochar represents a viable way of upcycling. A case study of the largest sludge-char pilot plant in Europe (in Finland) has been included, providing insights into its technical developments and operations.

Design for Circularity Decision Support in Manufacturing Industries

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Presenter: Annika Pruhs, annika.pruhs@hs-pforzheim.de (in person)

Problem statement: Industrial product development and design processes have to consider the entire life cycle of products from raw material extraction to the end of life in order to be able to automatically initiate and evaluate circular economy improvements such as lifetime extension or high-quality recycling. Assessment criteria might cover economic efficiency, climate friendliness, and resource efficiency, in addition to the widely-used property and benefit profiles of products. Such assessments need to consider circular business models and require integration into product development processes. So far, there is still a lack of feasible and practice-oriented solutions in this field.

Research aim: This paper aims at illustrating the operationalization of a comprehensive Design for Circularity (DfC) using a decision tree for the industrial product development process based on circular economy and technically oriented specifications.

Methods: The state of the art on DfC was assessed by means of literature analyses, which considered both, inherent product properties and external factors capable of influencing circularity. Results were assigned to a total of five dimensions reflecting central fields of influence: "market framework", "circular business models", "ecodesign approaches", "life cycle intensity", and "indicators". To support the implementation of DfC in product development process, these dimensions were compacted and transferred into a decision tree. The decision path leads to technical principles for implementing circularity and assigns appropriate design solutions. The multi-stage selection process within the decision tree was determined by decision matrix development and a judgement process by circular economy and product development experts.

Findings: Decision support for a DfC need to incorporate possible circular business models, relevant ecodesign approaches, and the life cycle intensities of particular products and product groups. Combining these dimensions with technical design and construction requirements results in a decision tree for DfC in industrial product design. The paper presents the decision tree as well as exemplifications of its use.

Conclusions and practical and scientific implications: The decision tree for DfC operationalizes circular economy in industrial settings. It thereby contributes to the actual implementation of circular economy in practice and benefits practice-oriented circular economy research.

The power of networks: A field data analysis of geographic network effects in the circular economy

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Presenter: Christoph Ratay, christoph.ratay@tum.de (in person)

Product Service Systems have the potential to align businesses' financial incentives with environmental objectives. Research on the circular economy and non-ownership consumption suggests that such offerings benefit from network effects (Wirtz et al., 2019) and require sufficient levels of supply to motivate system adoption and system use by consumers (Hazée et al., 2020; Lamberton & Rose, 2012). However, there is a need for empirical analyses of these effects based on field data capturing actual behavior. This paper leverages a large field dataset covering over two years of activity data of a system for reusable takeaway food containers to evaluate the effect of increased geographic network density of participating restaurants on (a) the acquisition of new users and (b) the frequency of system use. To this end, two different network density metrics commonly applied in research on food environments are used to measure the system's geographic network density around participating restaurants: The sum of inverse distances of a restaurant to all other participating restaurants (similar to Harrison et al., 2011) and the number of stores in a 1km buffer zone surrounding the restaurant (as used by Currie et al., 2010). Based on fixed effects Poisson panel models with both variables, this paper finds statistically significant and economically meaningful positive effects of increased geographic network density on acquiring new system users. Notably, results show that effects of increased geographic network density on user acquisition are positive across the entire relevant range of network density, but marginal effects diminish as networks get denser. In terms of frequency of use, no consistently significant effects of geographic network density are identified. These results contribute to the literature on network effects in multisided markets and in the circular economy by presenting field evidence of the importance of indirect, cross-side network effects on consumer adoption. Moreover, these findings encourage circular economy practitioners and policymakers to foster circular economy adoption by consumers through geographically dense supply networks.

Towards a consensus for measuring sustainable and circular production principles

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Sustainable production (SP) and circular economy (CE) have gained interest from manufacturing companies and stakeholders as a response to tackling the sustainability challenges that have been raised in the past decades [1]. The manufacturing industry is one of the sectors responsible for large waste and emissions generation, as well as the intensive use of natural and non-renewable resources, which impacts both the environment and the welfare of life forms [1]. Therefore, businesses must contribute to the global effort to achieve sustainable development by 2030, as recommended by the United Nations [2], by assessing the sustainability of their production processes. Sustainability assessment through indicators enables implementing sustainable practices, identifying improvements within the production process, showing key trends, and providing relevant information for stakeholders [3], [4]. Despite having a consensus on the need for indicators, the literature lacks an agreement about which indicators should be used to assess sustainability and circularity in production processes [1]. The literature covered the issues that explain the low adoption of sustainability measurement techniques, such as (1) companies not understanding the concept of sustainability and its application [5], (2) the incompleteness of the indicator sets in terms of integrating sustainability concepts with the CE [1], (3) indicators being generic and not sector-specific and (4) stakeholders not being included in the indicators selection process which impacts their applicability or relevance, among others [5]. These issues are highlighted in small and medium-sized enterprises (SMEs) which additionally face other challenges such as low capabilities availability, lack of governmental support, and cost barriers [6]. Despite many companies already incorporating sustainability measurements in their corporate reporting, there is still much to be done when it comes to making practical sense for companies of theoretical concepts such as SP and CE [7]. Therefore, the main objective of this study is to provide a practical framework to help SMEs in the manufacturing sector to measure their sustainability progress. It is also the purpose of this study to enhance the achievement of target 12.6, which encourages companies to adopt sustainable practices by incorporating sustainability information into their reporting cycle [2]. To this end, we have started from the principles of SP in the CE context set out by [8] and initially proposed a set of 47 indicators aligned to them. Indicators were identified through a literature review and were aligned to the SP principles by the research team. Finally, the set of indicators was enhanced and validated by experts through semi-structured interviews held with companies, academia, and public organizations. The results of this study conclude with a complete and concise set of indicators that include new indicators proposed to cover aspects that have not been assessed yet. Practical implications can be drawn for SMEs in the manufacturing sector that are starting their path toward sustainability. The set of indicators can guide the company's actions, it can be used to evaluate the impact of implementing new technologies and it can enhance decision-making processes by measuring sustainability improvement.

[1] V. Swarnakar et al., "Prioritizing Indicators for Sustainability Assessment in Manufacturing Process: An Integrated Approach," *Sustainability* (Switzerland), vol. 14, no. 6, 2022, doi: 10.3390/su14063264.

- [2] United Nations, "Transforming our world: the 2030 Agenda for Sustainable Development," 2015.
- [3] J. Lyytimäki, H. Salo, R. Lepenies, L. Büttner, and J. Mustajoki, "Risks of producing and using indicators of sustainable development goals," *Sustainable Development*, vol. 28, no. 6, pp. 1528–1538, Nov. 2020, doi: 10.1002/sd.2102.
- [4] C. Garcia-Saravia Ortiz-de-Montellano and Y. van der Meer, "A Theoretical Framework for Circular Processes and Circular Impacts Through a Comprehensive Review of Indicators," *Global Journal of Flexible Systems Management*, vol. 23, no. 2, pp. 291–314, 2022, doi: 10.1007/s40171-022-00300-5.
- [5] T. B. Ramos, "Sustainability assessment: Exploring the frontiers and paradigms of indicator approaches," *Sustainability (Switzerland)*, vol. 11, no. 3, Feb. 2019, doi: 10.3390/su11030824.
- [6] B. Zhu, M. Nguyen, N. Sarm Siri, and A. Malik, "Towards a transformative model of circular economy for SMEs," *J Bus Res*, vol. 144, no. January, pp. 545–555, 2022, doi: 10.1016/j.jbusres.2022.01.093.
- [7] A. Elalfy, O. Weber, and S. Geobey, "The Sustainable Development Goals (SDGs): a rising tide lifts all boats? Global reporting implications in a post SDGs world," *Journal of Applied Accounting Research*, vol. 22, no. 3, pp. 557–575, 2020, doi: 10.1108/JAAR-06-2020-0116.
- [8] E. Viles, F. Kalemkerian, J. A. Garza-Reyes, J. Antony, and J. Santos, "Theorizing the Principles of Sustainable Production in the context of Circular Economy and Industry 4.0," *Sustain Prod Consum*, vol. 33, pp. 1043–1058, Sep. 2022, doi: 10.1016/j.spc.2022.08.024.

H10: Transformation as a response to an external shock: Covid as a case example (1/2)

Session Chair: Philip Vergragt

Room: B: Omnia, R: Quantum 3 (max. 30)

Attempts to transform lifestyles to be more sustainable have been proposed over many years but met with resistance and barriers maintaining that it would not be possible to harness public support for major changes to entrenched habitual patterns of consumer behavior. However, could an external major shock break down such resistance and barriers and enable significant changes to lifestyles to become acceptable?

Covid can be seen as a major disruptor, an external shock which caused great stress to many but also opened up opportunities for lifestyle change as people were forced to accept and adapt to lock downs, quarantines and social distancing. Responses varied widely between countries and communities depending on their ability to cope with constraints, their existing living conditions and infrastructures for mobility and according to social and cultural attitudes to work, home and family.

In this session, the presenters will address the following questions:

- What did we learn from the Covid crisis about how external shocks influence lifestyles?
- What did we observe about the longevity/stickiness of lifestyle changes; and do we understand better the conditions under which lifestyle changes become permanent?
- Are these findings relevant for other external shocks, like for instance the present spike of high gas prices in Europe?
- Why did we fail to harness the pandemic shock? How could responses to a future shock be harnessed for transformations to more sustainable lifestyles?
- Could we recommend policy shifts and instruments to policy makers, activists, and researchers (e.g. governance and business models, regulations, taxation) which could be harnessed in response to a future shock?

The proposed sessions will present some data-driven observations across several countries which have significant local differences, depending on location, income levels and cultural context. The participants will reflect on the above questions with reference to how governments, local authorities, business and civil society responded in the Covid crisis and how we could better harness a future crisis to move towards sustainable lifestyles.

Line-up of speakers: In the first of two sessions we will present the following case studies:

Philip Vergragt (Clark University, USA): Introduction

1. Kira Matus (Hong Kong University of Science and Technology):

Spinning our Wheels? Trans-Covid Lifestyles in Hong Kong

2. Janis Brizga (University of Latvia) Māris Jurušs (Riga Technical University):

Covid-19 and energy crises induced mobility changes: a case study of Latvia

3. Lei Zhang (Renmin University of China)

Digital-Platform-Driven Urban Mobility Green Transition from dual perspectives of Covid 19 and carbon neutrality: the case of MaaS and Carbon Inclusive in Beijing

4. Tomohiro Tasaki (NIES, Tokyo, Japan):

Teleworking in Japan and cultural aspects: Why is teleworking rate low in Japan? Is a deeper change possible?

Spinning our Wheels? Trans-covid Lifestyles in Hong Kong

Kira Matus, HKUST, Hong Kong, China, kmatus@ust.hk

Presenter: Kira Matus, kmatus@ust.hk (in person)

Hong Kong entered Covid-19 as one the densest metropolises in the world, with a strong 'in person' office culture, a significant percentage of jobs and economic activity in tourism and retail, a notorious lack of affordable housing stock (and some of the worlds' smallest dwellings), and a public transport system that provided nearly 95% of daily trips for its residents. While Hong Kong has largely evaded a full-scale lockdown, periods of nearly universal 'work from home,' an on-going cycle of tightening and loosening of social distance measures that have restricted in restaurant dining and most forms of entertainment. During periods of stricter social distancing, behaviors shifted towards more take-away and delivery, online shopping, and outdoor activities (particularly hiking). Based on a combination of publicly available data and original public survey research, this talk will discuss which changes to habits in terms of remote work, leisure activity, shopping, and dining, appear to be 'sticky,' and which are short term responses to periodic waves of infections and their associated restrictions. We will present insights, based on comparisons between Hong Kong's Covid-19 experience and other 'shocks' (such as SARS in 2003/4) to better understand what makes particular consumption changes 'sticky,' and the potential, as well as limitations, that these present for policy action to support sustainable lifestyles.

Covid-19 and energy crises induced mobility changes: a case study of Latvia

Jānis Brizga, Green Liberty, Latvia, janis@zalabriviba.lv

Presenter: Jānis Brizga, janis@zalabriviba.lv (in person)

Transport is the second-largest source of greenhouse gas emissions (29% of the total) in Latvia and one of the only sectors where emissions keep growing as more and more people switch from public transport to private cars. The COVID-19 pandemic and energy crises of 2022 have had a significant impact on these mobility patterns. The government-imposed restrictions and support schemes, increasing energy prices, changes in work patterns and people's attitudes to safety have had a significant impact on how people travel patterns.

In this study, we analyzed and compared the effects of the COVID-19 pandemic and energy crises on public and private mobility in Latvia. Our analysis used statistical data and Google tracking data on public and private transport use, as well as survey data on remote work and economic indicators like income structure, and GDP growth.

The results show that the COVID-19 pandemic only slightly slowed the economy and didn't much affect jobs but the energy crises and inflation have had a much bigger impact on the economy. However, both crises affected expenditure structure – the pandemic allowed people to save money while energy crises emptied the pockets as energy costs increased.

According to the mobility survey data, the most common reason for travel of Latvian residents is commuting (34% of all journeys), shopping (24%), and leisure (20%). Our results show that public transportation and aviation have had the biggest loss during the pandemic and have not recovered so far, although the decline in transportation is not the same for all modes of mobility. At the peak of the pandemic, the use of public transport and commuting significantly decreased – by 25% compared to the pre-COVID-19 period, but at the same time increased visits to parks (by 60%). Introduction of the remote work could be an explanation for some of these changes during the Covid-19 pandemic as the data for remote work (in 2022 between 12% and 18% of employees worked remotely) and residential fuel consumption negatively correlate.

However, overall fuel consumption was not significantly affected by the pandemic, and also during the 2022 energy crisis with the increasing fuel prices consumption level stayed the same. Thus demonstrating a low price elasticity and people's dependency on mineral oils.

External shocks like the COVID-19 pandemic and energy crises impose significant perturbations to the existing systems and patterns, but also provide windows of opportunity to be used by policymakers, activists, and researchers to support the transition to sustainable mobility. Cities and countries should use such occasions to better prepare transport management in the future by comprehending changes in modes of transport and drivers behind them.

Digital-Platform-Driven Urban Mobility Green Transition from dual perspectives of Covid 19 and carbon neutrality: the case of MaaS and Carbon Inclusive in Beijing

Lei Zhang, Renmin University of China, Beijing, China, llllei63@hotmail.com

Xiaoxia Wang, Renmin University of China, Beijing, China, bwang725@ruc.edu.cn

Presenter: Lei Zhang, llllei63@hotmail.com (online)

Transportation is one of the most concerned areas in the green and low-carbon transformation of cities, and it is also the area where digital penetration and digital platforms are most active. Mobility as a Service (MaaS) system is expected to boost green transportation and a new way of transportation organization and supply, reflecting the coupling of the profound change of current travel demand and the urban transportation organization paradigm shift. Hundreds of MaaS practices of different sizes and models have emerged globally, and Beijing MaaS is the most influential MaaS practice in China up to now. The current theories and methods based mainly on MaaS practices in developed countries in Europe and the United States cannot adequately describe and analyze Chinese practices. Based on the literature, this paper extends and incorporates the Chinese experience and proposes a more inclusive MaaS system analysis framework, emphasizing that the identification of the similarities and differences of MaaS in the global context can be carried out in three dimensions, namely, the social context in which it is embedded, the characteristics of the development model, and the impact of the resulting socio-economic environment; and applies this framework to conduct a comparative study of five typical MaaS at home and abroad, focusing on decoding the incentive mechanism, business model and business ecology of MaaS in Beijing. This paper aims to promote the global development of MaaS theory and research methods, focusing on five concerns: (1) the development of MaaS systems once again tests how urban transportation returns to its public attributes; (2) MaaS practices are embedded in urban social contexts with obvious differences. MaaS opens a window of opportunity for urban transportation transformation; (3) the sustainable operation of MaaS systems still faces challenges; and (5) the new issues of data property rights, data privacy and security that need to be addressed.

Teleworking in Japan and cultural aspects: Why is teleworking rate low in Japan? Is a deeper change possible?

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The COVID pandemic has been disturbing our society forcefully and changed lifestyles in the world (Echegaray et al. 2021). However, the responses of countries have differed. According to Brachya (2022), teleworking from home was introduced quickly in many countries but the rates of teleworking were different. The rate has been higher in developed countries, which can be attributed to the different maturity of the digital network infrastructure. The work in cities and in IT sector has shifted to teleworking more than other sectors. This would be resulted from the affinity of working styles of individual sectors and teleworking. Teleworking rate in Japan has been lower, however, among developed countries where digital infrastructure does not seem a constraint for teleworking. Then a question arises: why is teleworking rate low in Japan? The author regards an external shock as a potential promoter to shift our lifestyles to sustainable ones or an opportunity for change. Fisher (2022) argues that AnthroShift is only possible if society is experiencing large-scale and sustained levels of risk that have tangible long-term consequences. Even if the COVID pandemic has provided such an opportunity, what prevents the change?

This presentation therefore explores the influential factors causing such a difference in teleworking rate. Among a variety of factors, this presentation focuses on cultural aspects. First of all, the current teleworking situation in Japan will be outlined based on a literature survey. The first wave of the pandemic sharply increased teleworking rate in Japan and the rate decreased to some extent after the wave (Okubo & NIRA, 2022). The subsequent waves of the pandemic did not affect the rate much. Okamura co. (2020, 2021) investigated perceptions of workers and found that 50 – 60% of the workers answered half of the internal meetings were unreplaceable. Goto and Hamano (2020) reviewed 17 surveys and found that the largest disadvantage of teleworking was difficulty in communication with co-workers. This difficulty was further subdivided into two aspects: (1) less information is obtained through teleworking, and (2) teleworking reduces the frequency of communication and makes casual communication difficult. The first aspect is probably rooted in the fact that Japan has a high-context culture, in which messages are often implied but not plainly explained (Meyer, 2014). The opposite countries are the US and European countries. Other cultural features of Japanese are high masculinity and high uncertainty avoidance (Hofstede, 2015). Masculinity is related to loyalty to companies, which suggests that Japanese tend to take it for granted to obey orders from executives who insist to come to the office. Uncertainty avoidance can formulate hesitation to start new rules and working styles. Doing nothing and observing what others will do could be the best option, as Alison (1969) found that standard operating procedures play an important role in decision-making.

Finally, the author will discuss what makes a difference between a shallow change, which will be returned to the old normal after the COVID pandemic, and a deep change, which will last after the COVID pandemic.

H12: Fashion Futures 2040: A Policy Lab

Session Chairs: Stephan Wallaschkowski, Katia Vladimirova

Room: B: Omnia, R: Momentum 1 (max. 30)

This session proposal builds around a year-long project led by Prof. Cosette Joyner-Martinez and Dr. Katia Vladimirova aimed to envisage possible futures for sustainable fashion consumption. The project was conducted by a working group comprised of fourteen members of the International research network on Sustainable Fashion Consumption between January 2022 and March 2023. The goal of the project was to identify possible dimensions of change and imagine how sustainable fashion consumption can be practiced in 2040. The resulting four ideal types of possible futures are discussed in relation to top-down (e.g., government-driven) versus bottom-up (e.g., consumer-citizen driven) transformation and to the application of the efficiency versus sufficiency logic.

To promote and to improve the results of this collaborative exercise, a very useful next step would be to discuss the futures together with practitioners from industry, policy, NGOs and advocacy groups, educational institutions, etc. to bring together the academic and the action side. At the beginning of the session, the co-chairs will present the results of the project. Then, invited guests from (a) a fashion company; (b) NGO/advocacy group; and (c) policy institutions will provide feedback on the scenarios. Afterwards, the floor will be open to comments, questions, and other feedback from the audience.

Possible questions for discussion:

- What are the chances for the various futures to happen?
- What are potential drivers and barriers for each scenario?
- Where would the speakers position their organization in these futures in 2040?
- How to move towards these ideal type futures?
- What may be potential pitfalls on the transformative path towards the specific scenarios?

Line-up of speakers: Co-chairs

Stephan Wallaschkowski, Leuphana University Lüneburg/Bochum University of Applied Sciences, stephan.wallaschkowski@hs-bochum.de

Katia Vladimirova, University of Geneva, ekaterina.vladimirova@unige.ch

Speakers

Co-chairs + invited practitioners

I: Saturday, July 8, 11.15-12.30

I01: Sustainable Consumption and Human Well-Being

Session Chair: Oksana Mont

Room: B: Omnia, R: Podium (max. 269)

Towards a Sustainability-Based Society: An Analysis of Fundamental Values from the Perspective of Economics and Philosophy

Joan Hereu-Morales, Chemical Engineering Department, Universitat Politècnica de Catalunya (UPC)-BarcelonaTECH, Barcelona, Spain, joan.hereu@upc.edu

César Valderrama, Chemical Engineering Department, Universitat Politècnica de Catalunya (UPC)-BarcelonaTECH and Barcelona Multi-Scale Science and Engineering Research Center, BarcelonaTECH, Spain, cesar.alberto.valderrama@upc.edu

Presenter: Joan Hereu-Morales, joan.hereu@upc.edu (in person)

Sustainability faces numerous challenges when applied to the real-world global economic model of capitalism. In implementing sustainability planning based on the triple bottom line (TBL), the prevailing trend of the economic pillar compromises both the environment and society. A new vision of enduring sustainability is proposed in this paper to address such challenges by first considering the global economic model in the real world and, second, having strong core values of sustainability. To evaluate the first characteristic, a review of the literature regarding capitalism and TBL-sustainability has been conducted. For the second characteristic, a historical–philosophical discussion around the role of society and the economy has been conducted. The results suggest that a realistic sustainable society requires a fixed and sustained focus on environmental and social pillars together with a flexible organisation of society (including its economic model).

Migori River Basin Gold-Mining, Telecoupling and Food Insecurity

Jack Ogembo

George Omondi

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Migori County is in Nyanza region around Lake Victoria gulf in Kenya. It borders Tanzania and Uganda. At the Southern end towards the lake shore, there is a small town called Macalder. This town was founded by a Briton gold prospector called Mark Holder in 1935. The indigenous people, mainly Luos, could not pronounce the name properly, so they called him Macalda and the name stuck. Migori County derives its name from river Migori that flows across the county and drains its waters into Lake Victoria. Before independence, Macalder was a robust gold and copper mining centre, but it was closed and abandoned by Europeans in 1966. However, that did not close the chapter of Macalder gold-rush because it ushered in local artisan miners that continued to exploit the minerals and gem stones, but they did not make much money. Lately, the Chinese and Indian prospectors and traders have ventured into the industry and boosted the volume of production and exportation of the minerals. There has been an outcry that the extensive artisan mining, now scaled up by Chinese and Indian investors, have polluted the environmental landscape, especially the water bodies and river systems, because they have deployed heavy machines in the work. Consequently, it is alleged that the fish catch has progressively diminished in proportion to the weight of extraction. This research intends to undertake a case study and qualitative evaluation of the impact of tele-coupling on food security, whether assessment is based on human practises on land or on the lake and other water bodies. The objectives of this study are to: (a) establish the degree of current pollution on the environment (b) estimate the foreign exchange earnings of the gold traders (c) assess the quantity of fish harvested over a period of 5 years as a factor of food insecurity. It will follow qualitative research methodology crafted to take a survey design using observation, interviews, testimonies and focused group discussions and thereby make a total case study. Where necessary, office records will be sought from the officers in charge. The data obtained by field notes, camera photos, video clips, will be subjected to descriptive and textual analysis using grounded theory, before a conclusive report is made. It is expected that the structure and stature of tele-coupling and output of minerals will reflect the degree of environmental degradation. All kinds of mining like underground mining, open surface mining, river diving mining or borehole mining will be covered along the river basin from the uplands to the lake-shore, and outline how they cause food insecurity.

A state-of-the-Art and a case study on the links between energy usage and human / more-than-human well-being in open spaces

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Climate is rapidly changing in Switzerland, summers are becoming warmer and local cooling habits reveal to be unadapted to the new seasonal temperatures. To avoid a generalisation of mechanical active cooling technologies – adding to the problem of energy consumption and the urban heat island effect, whereby cities are warmer than surrounding areas – understanding and boosting the role of open spaces for energy transitions and human well-being is a critical line of inquiry in Swiss urban and peri-urban areas. Open spaces refers to a large diversity of unbuilt and green spaces : wooded areas, agricultural or natural spaces, parks and gardens, sports fields; they can be public or private and relate to energy usage in various ways. Open spaces' microclimates strongly interact with the indoor environment, as it influences building ventilation, and the heating and cooling of indoor spaces. Such spaces also support ecosystem services through environmental promotion such as biodiversity conservation or water management. Moreover, they have been known to maintain social services in relation to human well-being and the synergic satisfaction of multiple human needs (Sahakian et al. 2020). This paper proposes two contributions: first, a state-of-the-art literature review on the relations between open spaces and human and more-than-human well-being. Second, an empirical study of open spaces and human wellbeing in Geneva and around the Evaux, 50 hectares park, including a survey (160 respondents) as well as 10 in-depth interviews and 4 months of field observations. This presentation will emphasize how the study could have integrated a post humanist approach to wellbeing. Taken together, these two inputs allow for a contribution to imagining the future of such spaces in relation to climate change challenges, and the implications for further studies. When asked if they thought the park had a role to play in the ecological transition, respondents were 82% to agree. If we aim at planning or revaluing existing open spaces and thus, answering citizens expectations to live, work and relax comfortably in the future, we need to better apprehend the importance of such spaces with the nexus of energy usage and human and more-than-human well-being.

I02: Transitioning towards Sustainable Lifestyles (2/2)

Session Chair: Hilje van der Horst

Room: B: Omnia, R: Quantum 1 (max. 30)

How the Covid-19 pandemic contributed to changes in climate change and environmental concern, resource-saving and waste-sorting behaviour

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The Covid-19 pandemic has changed not only attitudes and habits related to health care but also encompassed all other spheres even those related to environmental attitudes and pro-environmental behaviour. All the people spending the majority of their time at home had additional opportunities to change their habits, particularly those related to environmental aspects. Thus, the aim of this paper was to examine the Covid-19 contribution to the changes in the environmental, climate change and pandemic concerns during the period of the second wave and the slowdown of the Covid-19 pandemic before the other crises such as the energy crisis and inflation began. Furthermore, in this paper, the changes in resource-saving and waste-sorting behaviour and its determinants were analysed. The results revealed that during the pandemic the environmental and climate change concern increased significantly, and people also declared that the pandemic has encouraged them to sort waste and save natural resources more. Meanwhile, the concern about the Covid-19 pandemic decreased due to successful vaccination, other management tools for this illness and the emerging of another crisis. After analysing the main factors of changes in resource-saving and waste-sorting behaviour, we found that the changes in environmental concern influenced these behaviours the most. Changes in the Covid-19 pandemic concern also statistically significantly encouraged people to change resource-saving and waste-sorting behaviour. The environmental risk during the Covid-19 pandemic, significantly impacted the changes in resource-saving behaviour only. Meanwhile, the changes in climate change concern insignificantly influenced both pro-environmental behaviours. Therefore, this study reveals that the Covid-19 pandemic has taught people not only to care about the environment more but to carry out pro-environmental behaviour as well.

Sustainability transformation: How and Why lifestyle change towards less consumption is a necessary part of it

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This paper deals with an imperative aspect of sustainability transformation: how to change the very unsustainable, overconsuming lifestyles seen in rich societies? As humanity exceeds or threatens to exceed several of the planetary boundaries, lifestyle change towards reduced volumes of consumption in wealthy contexts and in most consumer areas (particularly transport, physical goods, energy, meat consumption) appears necessary in the long run. Accordingly, this paper theorizes how and why lifestyle change towards reduced volumes of consumption is a necessary part of the sustainability transformation.

The “Why-part” of the paper argues why lifestyle change is necessary. On the one hand this, in relation to consumption issues, is broadly recognized internationally (see SDG 12). On the other hand, it is less clear to what extent this recognition includes critiquing the volumes of consumption. Moreover, policies and studies of sustainable consumption have often rightly been criticized for its tendency to individualize responsibility and assume an overly rationalistic-cognitive assumption of agency. Even if this is frequently criticized in the literature – a critique shared in this paper – there is an opposite trap to ignore completely the crucial role of “people” as agents in the change process. Thus, in this article we address the importance of agency on the micro- and meso-level, while avoiding individual reductionism and insisting that lifestyle also must be seen as a macro-issue.

The “How-part” of the paper argues that the change process must be seen as a dynamic interplay between macro and micro; that is, (1) bottom-up (social movements, initiatives, innovations and social influence via a social-tipping point dynamics) and (2) top-down (politics, planning, policy, regulation) processes. Such a dynamic interplay will have to achieve nothing less than a “re-organizing of society”, locally, nationally, and on a global scale. In this part of the paper, we build on previous literature on the public experience, reflexivity, and transformative learning from both voluntary (e.g. sufficiency-inspired agency) and involuntary (e.g. the Covid-19 pandemic) examples of reduced consumption. By drawing on such literature we construct three ideal-type responses to calls for lifestyle change: frontrunning, adapting, and resisting. It is argued that the interactions between these responses are critical for the activation (or prevention) of change processes (both horizontally between groups in society, and vertically with regards to dynamic interplay between bottom-up and top-down driven change). These three responses should not simply be seen as represented by different segments of people in society – each response can exist in any person depending on the specific situation and consumer area (food, energy, transport, etc).

The paper draws on theories that cover both the macro-institutional and infrastructural context (economy, technology, politics, culture) and the meso/micro level, i.e. the social life context surrounding people (including close and distant social relations, social practices, processes of socialization, normalization, transformative learning; etc) (see Boström 2020).

Reference:

Boström, Magnus 2020. The social life of mass and excess consumption. *Environmental sociology*. 6(3):268-278

Current state of circular consumption in the Netherlands

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The Dutch government strives for a national circular economy by 2050. The transition to a circular economy does not only require new ways of producing but also a fundamental change of what and how we consume. In order for the Dutch government to design effective policies to stimulate these changes in consumer behavior, an overview is required of the current state of circular consumption in the Netherlands.

The aim of our study is to give such an overview and provide insights for policy makers to determine which types of consumer behaviors are relevant to focus on. To do so, we examined 92 circular consumer behaviors covering a wide range of consumption areas. We assessed two aspects: First, the extent to which consumers already engage in these behaviors or are willing to do so, based on which we calculated a potential for behavior change. The data was collected through a questionnaire among a representative sample of the Dutch population (n=2542). Second, we estimated the environmental benefits (greenhouse gas emissions and land use) for each circular consumer behavior, based on previous literature. By combining these two aspects, we are able to determine which behaviors have a high potential to reduce environmental effects. With regards to the potential for behavior change, we identified three states: The first state encompasses the behaviors that most consumers do not carry out yet and are not willing to do. This concerns sharing and renting of products, buying secondhand and refurbished products, and some behaviors to reduce consumption. In the second state are behaviors most consumers are willing to do but not doing yet, namely purchasing products made of more sustainable materials, prolonging product lifetimes, and other behaviors to reduce consumption. In the third state are behaviors that most consumers are doing already, mainly handing in products for recycling or giving them away for secondhand use and saving energy at home. Behaviors in the second state have generally a high potential for behavior change. Here, a large share of consumers could potentially be encouraged to change their behavior, if the barriers that currently hold them back are removed.

With regard to the environmental benefits, we found that behaviors that reduce consumption (eating less meat and dairy, buying fewer new clothes, not owning a car or living in a small space) have the strongest effect.

When designing circular consumer policy interventions, both the potential for behavior change and the environmental benefit have to be taken into account to maximize the policy effects. The most relevant behaviors are those with a large environmental benefit and a high potential for behavior change. The state of the behaviors gives an indication for the policy approach needed. For behaviors in the first state, it is primarily necessary to promote willingness. For behaviors in the second state, barriers have to be identified and removed to help consumers turn their willingness into actual behavior. Behaviors in the third state can be intensified, for example by reaching more consumer groups.

Mainstreaming sustainability: chances and determinants of consumers' inclusion in sustainable lifestyles

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Although authorities and NGOs make efforts to educate and persuade consumers of the need to change their behaviors into more sustainable ones, the expected deeper changes in global consumption and consumers' actions are missing. Sustainability is mostly manifested through single behaviors and actual sustainable lifestyles are visible only in the behavior of narrow groups of consumers perceived as 'eco-freaks'. And yet, the creation of a sustainable society requires that a whole set of sustainable actions is adopted and, most of all, broader groups of consumers are engaged in this trend. This raises various questions, i.e. what are the chances that 'ordinary' consumers become more involved in the sustainability and, above all, what may stimulate consumers' propensity to adopt it. Trying to answer these questions we take a novel approach, i.e. we use the concept of social inclusion as a basis for considerations, and introduce the notion of consumer inclusion in sustainable lifestyles. We relate this concept to overcoming specific social inequalities, meaning inequalities regarding consumers' awareness and their involvement in pro-environmental and pro-social activities. Hence, the purposes of this paper are: to characterize the degree of consumer inclusion in sustainable lifestyles, to assess the chances for greater inclusion, and to explore factors that foster such inclusion.

To meet these goals we used mixed methods research that included an online survey conducted on a sample of 1061 respondents and in-depth interviews conducted with 17 interviewees. All respondents were adult Poles. The survey was conducted in 2021, and the IDIs at the beginning of 2022.

Based on the interviews the drivers of inclusion in a sustainable lifestyle were identified. Psychological factors were found to be highly significant, e.g., sense of agency, concern for the future generations, awareness and perception of negative environmental changes and knowledge of their consequences. Also external factors, i.e. relevant regulations, infrastructure and technological solutions, and social influences, including e.g. peer pressures and opinion leaders' influence, were mentioned. The collected data reveal how consumers' gradual inclusion in sustainable lifestyles is realized and prove that this is a process, not just a state opposite to exclusion (cf. Øyen, 1997).

Survey results allowed to assess the chances of consumers becoming involved in pro-environmental activities. Respondents were presented seven hypothetical situations in which they had a choice between sustainable and unsustainable behavior, and asked to indicate the chances (on a scale 0-100%) that they would select sustainable option. The average of ratings was used as a synthetic measure, referred to as an 'index of inclusion chances'. Its mean value was 63%, but for more than half of the respondents the index ranged from 51 to 85%. We also found that some respondents' attributes significantly differentiated the indicated chances. Practical implications of the study include identifying people who are more likely to involve in sustainable lifestyles and indicating sustainable behaviors that are relatively easier to be included. Further research may explore mechanisms of building sustainable habits, enabling the expansion of sustainable behaviors.

Keeping pace with Europe toward a sustainable future: Structural drivers and barriers for low-carbon lifestyles in Spain

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The Paris Agreement states global warming must be limited below 2°C, optimally to 1.5°C compared to pre-industrial levels to tackle the negative impacts of climate crisis (UNFCCC, 2016). Similarly, the recent report from the Intergovernmental Panel on Climate Change has stated that the impacts of climate crisis have become more severe and obvious, hence calls for urgent action to mitigate the emissions through changing individual lifestyles (IPCC, 2022). Accordingly, political, economic, social and technological factors either can facilitate or hinder lifestyle changes (Fuchs et al., 2021; Schanes et al., 2016). To mainstream the sustainable lifestyles at individual level, first, it is crucial to identify the key structural drivers and barriers to adopt 1.5° lifestyles, and secondly to take adequate actions to promote these drivers and overcome the barriers.

The objective of this study is to identify the most relevant structural drivers and barriers to adopt the low carbon lifestyle options within the main consumption areas in Spain: nutrition, mobility, housing and leisure. To that end, we first conducted a literature review on structural drivers and barriers to embrace low carbon lifestyle options. Then, we validated and extended our results through conducting 5 semi-structured interviews and a stakeholder thinking lab participating 22 academics and practitioners with extensive knowledge and expertise on the field of sustainable production and consumption.

Our results show that the most relevant structural drivers for Spaniards in these areas of consumption consist of: 1) economic measures incentivizing circular economy business models, 2) concrete and consistent public policies, 3) education on sustainable development, including the life-long learning, and 4) dissemination of good practices on sustainable lifestyles. As regard to the most relevant structural barriers, they consist of: 1) lack of consistent climate and sustainability policies, 2) green growth-oriented narratives, 3) financial constraints, and 4) lack of knowledge and awareness about sustainability practices. These findings provide valuable insights to decision-makers to develop adequate economic, political and social ground for sustainable lifestyles, specifically, in these four areas of consumption.

References:

Fuchs, Doris, Julia Steinberger, Elke Pirgmaier, William Lamb, Lina Brand-Correa, and Jonathan Cullen. 2021. A corridors and power-oriented perspective on energy service demand and needs satisfaction. *Sustainability: Science, Practice and Policy* 17(1): 163-173, Doi: 10.1080/15487733.2021.1912907.

IPCC, 2022: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press. Cambridge University Press, Cambridge, UK and New York, NY, USA, 3056 pp., doi:10.1017/9781009325844.

Schanes K., Giljum, S., Hertwich E. (2016). Low carbon lifestyles: A framework to structure consumption strategies and options to reduce carbon footprints. *Journal of Cleaner Production* 139 (2016) 1033-1043. Doi: <http://dx.doi.org/10.1016/j.jclepro.2016.08.154>

UNFCCC (2016). The Paris Agreement. United Nations. Available at:
https://unfccc.int/sites/default/files/resource/parisagreement_publication.pdf

I03: Between Circularity and Bioeconomy: Assessing and Monitoring Socio-Ecological Transformations

Session Chair: Luc F.M. van Summeren
Room: B: Omnia, R: Quantum 4 (max. 30)

Review of circular economy maturity model indicators and metrics for manufacturing companies

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The circular economy is listed as a part of the European Green Deal for sustainable development and has a lot of potential, e.g. to achieve the planned climate neutrality of the European Union. In order to achieve a widespread establishment of the principles of the circular economy, manufacturing companies in particular must be shown ways and strategies of how to implement a change in their structures and processes to this end. As the transition from linear to circular production processes is very complex, a broad base of know-how is required on which steps should be taken on the path to the circular economy, e.g. to build up circular business models.

However, many manufacturing companies, especially small and mid-sized companies, do not have the necessary capacities to plan their transformation. One starting point is provided by maturity models, which companies can use to identify their current maturity level within their transformation process and derive transformation strategies based on this. While maturity models are established in other areas, e.g. IT or project management, only a few circular economy maturity models can be found in the scientific literature. For this purpose, maturity models of the circular economy at the company level (micro level) were identified in the literature, compared and analysed with regard to their theoretical and methodological structure. The aim of this review is to examine the maturity models of the circular economy identified from the literature in terms of their structure completeness as well as their quality. Since the terms "maturity model" and "readiness model" are often used to assess the transformation process, this paper considers both types of models to provide a more comprehensive result. A particular focus was placed on the analysis of the business units considered in the respective models on the one hand, and on the underlying key figures and indicators on the other, in order to determine the individual maturity level of the entire company.

The results of the review show, among other things, a significant difference in the viewing focus of their assessment framework. Few circular economy maturity models include the company with supporting areas outside the value-creating core process in the assessment framework, e.g., management, vision, service, etc. Therefore, there is usually a lack of a holistic company view. In addition, there are major differences in the number and type of observation categories, their indicators as well as their metrics. For example, most models frequently use subjective indicators and very few objective indicators in their surveys. It was also found that there are

rarely well-founded thresholds between maturity levels, making it difficult for manufacturing companies to verify when their circular transformation has successfully progressed. Based on the results obtained, a basic set of indicators for circular economy maturity models is established and concrete suggestions are made for building a solid circular economy maturity model for manufacturing companies.

The Impact of the Digital Economy on China's Household Consumption Carbon Footprint and its Inequity

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In the wave of rapid development of the digital economy, the continuous iteration of information and communication technologies (ICT) and the emergence of new forms of the network economy, such as sharing platforms and online shopping, have brought profound changes to people's production and consumption, especially changing people's consumption patterns and even lifestyles. This change is also influencing the landscape of the response to climate change. This paper focused on how the development of the digital economy affects household consumption patterns and carbon footprints in China, analyzed the transmission mechanism. Specifically, this paper examined the impact of the digital economy on the household consumption structure and their carbon footprint in different regions in China from the macro perspective, and the impact of the digital economy on the carbon footprint inequality in different income groups from the micro perspective.

Based on panel data from 2002-2019, this study applied an environmentally extended multi-regional input-output approach to estimate the household carbon footprint of 10 different income groups in 30 provinces and cities of China. Subsequently, the carbon footprint Gini coefficients were calculated to measure the carbon inequality of households in different provinces. An evaluation system of China's digital economy development level was constructed from three aspects: digital infrastructure environment, digital industrialization and industrial digitization. Through econometric analysis, we empirically examined the impact of different stages of digital economy development on household consumption structure and carbon footprint.

The empirical results show that the development of the digital economy has changed the household carbon footprint by changing consumption patterns. The development of the digital economy has reduced the carbon footprint of consumption in urban and rural areas. In particular, it has changed the way people consume in transportation, communication, and education, culture and entertainment. In addition, the development of the digital economy has reduced the gap between regions' carbon footprint, but has increased the carbon footprint inequality between different income groups. This indicates that the development of digital economy has changed China's consumption pattern, which helps reduce carbon footprint inequality between different regions, but carbon footprint equity between different income groups still needs to be further explored. The government could further promote the development of the digital economy by strengthening the regulation of the digital sector and providing institutional safeguards for fair competition in the digital economy.

Systemic Monitoring of the Bioeconomy Resource Basis and its Environmental Impacts

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With the political ambitions of moving away from a fossil-based towards a biobased economy, the need for environmental and socio-economic assessments of biobased economic activities is increasing. In policy contexts, bioeconomy refers to all economic activities related to biobased materials' production, processing, and consumption, including systems and services. It aims to create a sustainable economy based on biomass extraction from healthy ecosystems [1,2]. To help meet this ambition, monitoring the resource base of the bioeconomy and its environmental impacts is key. While there are several initiatives developing bioeconomy monitoring systems [3–5], we suggest designing a systemic monitoring approach that is rooted in the socioeconomic metabolism [6] of resource extraction and emissions, including its drivers, pressures, and environmental impacts along causal chains [7]. Monitoring biomass production and consumption at a national level implies mapping the national activities and tracing global resource flows to their source. The resource flows are, in turn, related to bundles of environmental impact categories. In this study, a conceptual analysis helps identify key monitoring elements and their interconnections, using a societal metabolism and causal chain perspective. A literature review about how to monitor these elements helps derive the building blocks of a systemic approach to monitoring the national bioeconomy. Based on the conceptual perspective and the state of the art in each relevant field, we propose a monitoring system that integrates multi-regional input-output (MRIO) analyses of global trade flows with spatially explicit land-use, water scarcity, and biodiversity modeling while expanding the commonly used consumption-based footprint accounting to a whole economy perspective. To facilitate the interpretation and communication of results, we suggest using a limited number of indicators that reflect bundles of impact categories. We argue that this is helpful from a policy perspective to support the transition to a balanced bioeconomy. To illustrate how this monitoring system can be implemented, we present the model core of the pilot monitoring structure of the German bioeconomy, developed in the research project SYMOBIO. The proposed monitoring system and the applicable example for implementation make important contributions to the development of monitoring frameworks.

References

1. Bundesregierung der Bundesrepublik Deutschland. 2020
2. A sustainable bioeconomy for Europe: Strengthening the connection between economy, society and the environment : updated bioeconomy strategy. Luxembourg: Publications Office of the European Union; 2018
3. Bracco S, et al. FAO. 2019
4. Kilsedar C, et al. Implementation of the EU bioeconomy monitoring system dashboards: Status and technical description as of December 2020. Publications Office of the European Union; 2021
5. Ronzon T, et al. Building a monitoring system for the EU bioeconomy: Progress report 2019 : description of framework. Publications Office of the European Union; 2020.
6. Pauliuk S, et al. Ecological Economics. 2015;119:83-93
7. EEA. Environmental indicators: Typology and overview. Copenhagen, Denmark; 1999

Holistic and Integrated Sustainability Assessment for Bioeconomy and Societal–Ecological Transformation

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The social, economic and ecological relations in global capitalism have condensed into a socio-ecological crisis, since the unequal satisfaction of societal needs seems to be directly linked to a massive transgression of planetary boundaries. Germany exceeds the planetary boundaries by a factor of about 3.3 and a decoupling by this factor is implausible by purely technological means.

We first introduce the double decoupling and societal-ecological transformation approach to this fundamental problem: in addition to a necessary technical decoupling, there is a need for a societal decoupling of the satisfaction of societal needs from an increasing production of goods (sufficiency), and thus a transformation that goes beyond the existing economic system. Against this background, the container term bioeconomy can be understood as a sustainable use of renewable instead of fossil resources. However, sustainability is not an intrinsic characteristic of the bioeconomy, but must be defined, analyzed, evaluated and interpreted.

For this purpose, we secondly present an integrated sustainability framework with clear and applicable definitions of sustainability: the long-term and global fulfillment of societal needs and well-being as an end (social sustainability), long-term stability of our environment as a basis of societal reproduction within PB (ecological sustainability), as well as technologies and economic structures as efficient, effective, sufficient and just metabolisms which enable the fulfillment of societal needs within PB (economic sustainability).

In order to assess and analyze integrated sustainability, we developed the Holistic and Integrated Life Cycle Sustainability Assessment (HILCSA) as an transdisciplinary and critical method for the analysis and evaluation of societal, ecological and economic sustainability of concrete production and consumption systems in the bioeconomy and beyond. HILCSA integrates social, economic and ecological LCA in a common goal and scope, life cycle inventory, life cycle impact assessment, results and interpretation.. This fully software implemented and database driven assessment method entails a set of 102 quantitative and qualitative indicators capable to address societal needs by 24 indicators, economy by 56 and the PB by 22, as well addressing 14 out of 17 SDGs.

The results from two first case studies show that systemic assessments have to take a broad range of aspects into account. Eventually, the idea of a BE and as well systemic assessments is a question of the perception of ends and means of a societal transformation. Measuring how bioeconomy contributes to sustainable consumption and production achieving the Sustainable Development Goals, HILCSA can provide an information and decision basis for stakeholders such as politics, society, research and organizations.

ZEUG, W., BEZAMA, A. & THRAN, D. 2021. A framework for implementing holistic and integrated life cycle sustainability assessment of regional bioeconomy. *International Journal of Life Cycle Assessment*.

ZEUG, W., BEZAMA, A. & THRÄN, D. 2022a. Application of holistic and integrated LCSA: Case study on laminated veneer lumber production in Central Germany. *The International Journal of Life Cycle Assessment*.

ZEUG, W., BEZAMA, A. & THRÄN, D. 2022b. Life Cycle Sustainability Assessment for Sustainable Bioeconomy, Societal-Ecological Transformation and Beyond. *Progress in Life Cycle Assessment*. Springer.

Consumption based national indicators for use of hazardous chemicals – mixed results from time series

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Risks associated with the use of hazardous chemicals are becoming more apparent. It was for example recently suggested that the safe operating space of the planetary boundary of novel entities (including hazardous chemicals) is exceeded since annual production and releases are increasing at a pace that outstrips the global capacity for assessment and monitoring. Consumption based indicators for national emissions of greenhouse gases are now produced regularly, for example as part of the Swedish Official Statistics. Consumption-based national indicators the use of hazardous chemicals are however largely lacking. The aim of this study was to develop times series for three consumption-based indicators for Sweden: use of pesticides, use of veterinary antibiotics and use of hazardous chemical products. The method has previously been developed and described for a single year, but time series for these types of indicators have to our knowledge never been presented. The indicators were calculated by combining data from Sweden's Environmental Accounts with a Multi-Regional Input-Output Dataset (EXIOBASE) which is the same approach as used for calculating Swedish official statistics for greenhouse gas emissions. Data for the use of hazardous chemicals were taken from regularly updated institutional national and international databases. The results show that the use of veterinary antibiotics decreased by about 50 percent whereas the use of pesticides decreased by about 10 percent. In contrast, the use of hazardous chemical products increased. Results show that construction (including buildings and infrastructure), is the single largest product group for the use of hazardous chemical products followed by retail, real estate and chemical and pharmaceutical. All have increased their use of hazardous chemical products between 2013 and 2019. Results also show that although Sweden is the country that contributes most to the use of hazardous chemical products for Swedish consumption, the majority comes from imported products of which most comes from countries within the European Union. The results for the use of hazardous chemical products for Swedish consumption is worrying and suggests that this needs further follow-up and also policy initiatives. The decreasing trends for the use of pesticides and veterinary antibiotics, which are areas where there are policies, are more encouraging.

I04: Adopting Circularity in Business and Procurement

Session Chair: Jennifer Russell

Room: B: Omnia, R: Momentum 1 (max. 30)

Meaningful Circular Economy Jobs: Does Circular Economy Awareness Enable More Meaningful Work?

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Problem statement: The circular economy (CE) is seen as path to operationalizing sustainability by decoupling economic growth from the environment (Aguilar-Hernandez et al., 2021; Merli et al., 2018). Nevertheless, one of the criticisms to this attractive narrative is that it disregards the social dimension of sustainability (Kirchherr et al., 2017; Mies & Gold, 2021). Job creation is one of the most cited social benefits of the circular economy (Mies & Gold, 2021), but there is a lack of discussion regarding the quality of the jobs to be created. This work explores the quality of the jobs created in the CE by studying meaningfulness in circular economy jobs through the lens of organizational behavior theory. This perspective expands the view of what constitutes a desirable job by looking at the satisfaction of both their basic physiological and psychological needs (Ryan & Deci, 1985).

Research questions/aims: The main research questions this study addresses are: What factors are most important in explaining meaningfulness in circular economy jobs? Does having greater awareness of the circular economy increase worker's experienced meaningfulness? Through what mechanisms does awareness of circular economy affect experienced meaningfulness?

Methods: A pretest-posttest control quasi experiment including two surveys and an intervention was conducted with employees of two CE companies in the US. The survey included measures such as autonomy, skill variety, co-worker relations, knowledge of circular economy, perceived social impact, perceived social worth, experienced meaningfulness on the job taken from three different studies of the organizational behavior literature (Grant, 2008; May et al., 2004; Morgeson & Humphrey, 2006). The intervention consisted of a five-minute training video explaining the concept of the CE, its potential benefits, and how workers contribute to the CE. Path analysis was used to test if having greater awareness of the CE increases worker's experienced meaningfulness and the mechanisms through which this occurs (e.g., task significance, perceived social impact and perceived social worth).

Findings: Employees' increased perception of the potential CE benefits, and their own participation in CE contributes to workers experiencing higher levels of meaningfulness in their jobs by increasing levels of task significance. CE perceptions and awareness helped explain experienced meaningfulness on the job even when controlling for other job characteristics.

Conclusion: Circular economy training can be used to increase circular economy worker's experienced meaningfulness on the job. This can lead positive outcomes for both workers and circular economy companies.

Practical and scientific implications: Understanding what makes work meaningful in the context of the circular economy can help CE companies develop strategies to attract and retain circular economy workers. Meaningfulness is strongly correlated with engagement at work, commitment,

and job satisfaction (Hackman & Oldham, 1975; Kahn, 1990; May et al., 2004; Rosso et al., 2010). The ability of CE sectors to attract works rapidly is cited as a potential barrier to successful implementation of CE policies (Boonman et al., 2023). From a scientific perspective, this study contributes to much needed research on the employment the CE and it brings attention to the need and potential to include psychological needs satisfaction in the discussion of what constitutes desirable work.

What impedes circularity in public procurement? Nudging the purchaser to implement the contracts

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Circular public procurement, CPP, is pointed out as one strategy to increase sustainability and circularity for the large volumes of goods and services procured by public organizations. Introducing circularity requires increased collaboration with suppliers and internal actors and leads to work procedures and changes in activities. Research on CPP has mainly focused on the implications for the procurement stage, while studies on implementation in public organizations are scarce. Once a contract is procured and purchasers start buying products and services, they have to consider and make choices on different aspects linked to sustainability and circularity, areas they do not necessarily have competence in. To facilitate the implementation of circular solutions in the public sector, research has to look beyond the procurement stage and also focus on the next step, purchasing from procured contracts and how to improve this process.

Consequently, this study aims to analyze the challenges of circularity in the public procurement implementation chain, and to explore the possibility of supporting purchasers through nudging. Case studies of two of the largest procuring organizations in Sweden are included in the study, one city and one region. The data collection consists of document analyses of policy, strategy, and sustainability plans for the two organizations, as well as interviews and workshops with key respondents.

The results provide insights into the challenges arising along the interlinked steps of public procurement implementation. The key challenges are insufficient knowledge of circularity and its implications on the organizations, lack of defined targets and priorities for sustainability goals, and insufficient support for the choices and decisions made in procurement and purchasing. Although not everyone can or should become an expert, some knowledge and understanding of sustainability make individuals more receptive to nudging.

The results show how several different nudging tools have the potential to facilitate the choices in the purchasing step. Nudging can raise awareness and support individuals to either make their own more informed choices or call on expert help. In the case of circular solutions, it is important to highlight the life-cycle perspective and its implication for the staff and activities in the organization, as the effects may be less visible at first glance. Eco-labels, visualization of key aspects, highlighting consequences and using social influence are examples of nudging techniques to help overcome some of the purchasers' challenges. Nudging is, however, not the solution to all the challenges identified in this study, such as the need for ranking sustainability outcomes in line with organizational goals. This type of strategic decision does not belong in the choice process of the purchaser. It is evident that issues that are not solved early on create challenges along the public procurement implementation chain. The results from this study contribute to the fields of sustainable consumption and organizational change, as well as to provide implications for public procurement and the use of nudging in a public purchasing context.

The role of Transition brokers in adopting Organisational Circular Frames that drive the circular economy transition

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The term 'circular economy' (CE) has been described as a new sustainability paradigm (Geissdoerfer et al., 2017). However, most research focuses firmly on technological advances and efficiency gains, stopping short in extending their approaches to the role of human beings in the transition towards a CE. Ignoring the role of individuals could significantly hinder the transition. Indeed, there is no circular economy without a circular society (Jaeger-Erben et al., 2021). To bridge this gap, more research is required to understand the role of individuals within businesses as drivers of the CE transition.

This research thus examines the integrated processes of organizations and key individuals to develop sustainability frames that are more systems-oriented. As conceptual point of departure, we use Cramer's concept of 'Transition Broker'. A Transition Broker describes a "persons that orchestrate the process of establishing circular initiatives at system level" (Cramer, 2020). By doing so, we investigate the following research question(s):

- How and why can professionals drive the circular transition from within businesses?

Sub-research questions include:

- What makes a person a transition broker?

- Which intra and inter-organisational dynamics must be in place to drive circular practice adoption?

- How can businesses shift their Organisational Circular Frames to drive a transition to become circular?

We collected data between 2021-2022 in the form of qualitative semi-structured interviews conducted with members from a major CE Hub in Brazil. Data were analysed following an abductive thematic analysis approach, and triangulated with notes taken during Hub meetings, business reports and website content.

Drawing on Mazutis et al.'s (2021) work on Organisational Sustainability Frames (OSFs), our research demonstrates that businesses apply different Organisational Circular Frames (OCFs) determining the extend they are able to drive circular progress both internally and externally. Generally, OCFs provide collectively constructed sets of knowledge and beliefs about an information domain that influences how choices are made in organizations.

Our research shows that the role of a Transition Broker (TB) is to apply S-OCF and to initiate change internally and externally. However, findings indicate that especially bigger businesses are more likely to follow Cosmopolitan-OCFs with Transactional-OCFs being applied during organisational decision-making processes and managerial decisions utilising popular efficiency and "win-win" language. This is especially the case in businesses where the sustainability department is not fully integrated or limited buy-in from senior executives is given. In contrast, SMEs fall mostly into the category of Communitarian-OCFs.

Facilitated through the engagement with other businesses in the Hub, a heightened awareness regarding the importance of more Systems-OCFs was observed. Notably, this awareness, however, was seldomly translated into actions or the adoption of new business models.

Our research has far-reaching implications for practitioners, providing insights into organisational change and the wider CE transition. Furthermore, we make a theoretical contribution to the literature on OSFs by applying them to a real-life CE context, offering novel insights into OCFs and their importance for businesses and the wider, urgently required circular transition.

Circular public procurement – combining technical solutions and organizational effects

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Public procurement is stated to be a policy tool for more sustainable consumption and production, and in recent years also to promote a circular economy. Considering the large volume of goods and services procured each year, public procurement can significantly influence the sustainability of the public sector if used in the right way. Furthermore, public authorities are often identified as essential drivers to implementing circular and sustainability goals of nations and thus have the possibility to lead the sustainability transition.

Circularity can be implemented with different scopes, from improved waste management activities to full-fledged Product-Service Systems where the results are the focus of procurement instead of a product. For a municipality at the beginning of its journey towards integrating circularity in everyday practice, these different approaches can be a daunting task. Furthermore, the life cycle perspective adds a new dimension to procurement and requires increased internal collaboration for the procuring organization. These challenges need to be overcome for CPP to transform from pilot projects to large-scale schemes and have an actual impact.

This study aims to highlight and explain the challenges that arise when implementing circularity through public procurement by analyzing a case from a medium-sized municipality. Three different procurement categories are investigated: food, infrastructure, and IT. These are chosen due to the large volumes procured in combination with their high environmental impacts.

Documents were used to gather information on policy and action plans, while interviews captured the managerial, operational, as well as procuring perspectives for each category. This data was used as a base for workshops with participants from each category where potential circular solutions in terms of circular criteria, contract type, implementation in the operational activities and identified organizational challenges were discussed.

The results suggest that the different procurement categories have their own unique contextual challenges related to, e.g., criteria, land use, or individual ambition. However, the results also show common, more overarching challenges inherent in the municipal organization, such as political agenda, silo structures, lack of communication, and limited knowledge of circularity. This study shows that circular solutions are often contextually dependent due to the life cycle aspects, and it is thus essential to understand the implications of this in the procurement stage to achieve a larger scale of CPP implementation. It is evident that generic technical solutions are not the optimal answer to these challenges, but the organizational implications and changes need to be considered for CPP to be integrated into the procuring organization as a tool for achieving sustainability goals.

The study contributes to the fields of policy implementation and CPP, as well as the use of circular business models in a public context. The results can also be used by municipal organizations to identify and overcome similar barriers in their work with circular and sustainable procurement.

Circular economy and strategic oversight in policymaking: Evidence from regional Electric Vehicle policies in India

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Circular economy (CE) has been proposed as an “alternative growth discourse”, more so in the case of developing countries with a strategic focus on de-carbonizing different socio-technical systems while maintaining growth. Therefore, it is important to understand how policymakers create and enable pathways for the circular economy’s wide-scale adoption while designing sectoral policies for sustainability transitions. Current discussions on the circular economy from a policy-making perspective can be categorized as either top-down (national policy objectives in China) or bottom-up (resource efficiency initiatives in the EU, the US, and Japan). All such initiatives entail different sectors including electric vehicles and batteries industries.

Electric vehicles ecosystem (EVE), an emerging transition, offers a unique opportunity for integrating circular economy agenda. The increasing policy push for electric vehicle transitions and associated economic benefits necessitates analyzing strategic focus on the circular economy in these policies to understand whether policymakers have utilized a circular economy perspective to facilitate the transition. We analyze electric vehicle policies at the regional level in India to assess whether such industrial policies have a strategic focus on circularity.

We conduct a correspondence analysis of EV policy documents of 19 Indian states and plot them based on their similarities. We also plot these 19 states using principal component analysis based on their overall local manufacturing context — manufacturing sector growth rate, ease of doing business scores among others. We compare these results to show that these policies are uni-dimensional irrespective of states’ local context and overlooks potential of circular economy. Our analysis reveals that the primary focus of all these policies is on promoting manufacturing by providing incentives for vehicle and battery manufacturing. Out of 19 state policies, only 7 mention scrapping old automobiles, 9 mention recycling and reusing (primarily battery recycling, and second life usages), 8 states include pollution boards which are nodal agencies for recycling, and 7 mentions urban mining. Only 2 of the policies out of 19 include all these features.

Even in the policies where circularity is mentioned, there are no explicit incentives to promote circularity-related sectors as primary industries. At this stage, the financial incentives and subsidies to create a recycling and material recovery sector are not specified in any policies, unlike similar mechanisms for EVE manufacturing and charging infrastructure.

With an integrated approach to these policies by focusing on circularity, states can create niches that foster circularity links. Such a strategic focus in states whose traditional manufacturing capacities have been limited due to various reasons creates opportunities in sectors such as material recovery, recycling, and re-usability – areas that remain largely unexplored.

EVE offers a great opportunity to implement circularity as the sector is still in its nascent stages. With appropriate provisions for circularity links, there are financial benefits through the recovery of rare materials for resource-constraints countries to hasten the transition. Policymakers can focus on circular economy in EVE policies as emerging niches and promote their creations, and the emergence of new regimes beyond just manufacturing.

I05: Everyday Circularities: Rethinking Consumption in the Circular Economy (2/3)

Session Chair: Mary Greene, Kersty Hobson

Room: B: Omnia, R: Auditorium (max. 108)

Leverage points for reducing the consumption of plastics: Social practices as a starting point for systemic design

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This paper takes a systemic design approach to the consumption of plastics and explores social practices as a starting point for mapping and analyzing complex systems. Plastics describes a group of materials mainly derived from petrochemicals that have become ubiquitous in our everyday lives. Although, plastic products have become indispensable to us, they also contribute significantly to detrimental effects on the environment, wildlife, and human health. Reducing plastics will require systemic changes not only in the way we produce products with or without the use of plastics, but also within everyday practices of consumption in which plastic products are deeply embedded.

This study is part of the research project REDUCE focusing on three areas of consumption; hygiene, leisure, and children products. The aim is to study the significance of plastic products in everyday life, identify leverage points for reduction, and propose new concepts and future ways of living better with and without plastics. To understand the dynamics between plastic products and everyday practices we draw on systems thinking in design (Sevaldson, 2013), and social practice theory as applied in relation to design (Shove, Pantzar, & Watson, 2012). Systems thinking is recognized as a key competence to solving the present environmental challenges (Rieckmann, 2018). Moreover, it is identified as a critical skill for designers to identify solution areas in complex and dynamic systems and evaluate the impact of interventions before implementation (Design Council, 2021). By taking social practices as a starting point for exploring systems, we aim to tackle the vast complexity of plastics consumption and production while making both theoretical and methodological contributions to the two fields.

Qualitative data gathered from focus groups will be utilized to identify social practices and systems in the context of hygiene, leisure and childhood involving plastic products. Identified social practices will create the basis of workshops where we apply methods from systemic design. The analysis will be oriented toward the understanding of change within the two theoretical approaches to provide new insights for efforts to make system level changes in consumption (Meadows, 2009). Accordingly, the study will identify leverage points for intervention and reduction in plastic consumption by analyzing complex systems that need to be approached holistically to produce results that make solid grounds for interventions.

References

Design Council (2021). Beyond Net Zero: A Systemic Design Approach. London, UK.

Rieckmann, M.(2018). Learning to transform the world: key competencies in education for sustainable development. In: Leicht, A., J. Heiss, & W. J. Byun (eds) Issues and trends in Education for Sustainable Development, p. 39-59, Paris:UNESCO.

Shove, E., Pantzar, M., & Watson, M. (2012). The Dynamics of Social Practice: Everyday life and how it changes. London: SAGE Publications Ltd.

Meadows, D. H. (2009). Thinking in systems: A primer. London: Earthscan.

Sevaldson, B. (2013). Systems Oriented Design: The emergence and development of a designerly approach to address complexity.

Circular Plastic Consumption in Everyday Life – Exploring socio-material constraints and imaginaries through a practice-oriented approach

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The technocentric approach advanced by most circular economy (CE) policy and research frameworks has perpetuated an absent or largely passive role for the consumer in CE transitions. The implication is a transitions agenda which prioritises closing material loops through technical and economic means while overlooking questions of reducing material consumption through lifestyle changes. This is a grave limitation given the mounting scientific evidence which indicates that without addressing overall resource demands, CE will be unable to deliver the scale of transformative change required to tackle our environmental crisis.

Focusing on dynamics of plastic consumption in households in the Netherlands, this paper seeks to offer an innovative approach toward researching and understanding the potential for circular transitions grounded in the daily life of the everyday consumer. To this end, a social practice theory approach is combined with a multi-modal, imaginary futures methodology is employed with a diversity of household types, varied across life stages and composition, to uncover the socio-material conditions which drive plastic consumption at the household scale and constrain or enable possibilities for future circular consumption processes.

The findings reveal how plastic consumption is rooted in intersecting arrangements of daily life practices and their embeddedness in systems of practice. After first unpacking how plastics are embedded in daily practice arrangements, the paper presents and discusses insights into key socio-temporal and socio-spatial material constraints that present opportunities and barriers to circular plastic consumption. These include social variation in the spatiotemporal and domestic organisation of daily life; socially varied norms and standards surrounding everyday conduct, convenience and disposability and differential engagement with the socio-technical systems and structures in which everyday life and plastic consumption are embedded. The paper concludes with reflections on the potential for everyday life practices as a site where circular systems change plays out and outlines directions for future inquiry and investigation.

Reducing single-use plastics in everyday life – insights from a living lab experiment

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Plastic is a ubiquitous part of everyday life, and there are few consumer activities that do not involve the direct or indirect use of plastic. The use of single-use plastic (SUP) based on fossil fuels is particularly problematic from an ecological point of view, as it seems to be virtually unavoidable, especially in the case of everyday products - from the plastic wrapping of cucumbers to shampoo bottles. As concerns about plastic pollution become more pervasive, researchers and policymakers are spurring a movement toward reducing the ecological damage by plastic consumption, e.g. by fostering plastic recycling or the development of bioplastic. However, there is still a lack of understanding on how to reduce or substitute SUP in everyday life practices. We argue that reducing SUP consumption requires a concrete exploration of how social practices and conventions in everyday life are enhanced and facilitated by the use of SUP in order to better understand the challenges of reducing or substituting SUP. To substantiate this, we conducted a Living Lab experiment with 21 consumers from different parts of Europe based on a social practice theory perspective. In doing so, we used diaries, questionnaires and workshops with some of the participants to develop potential solutions and future scenarios that best fit their daily routines. Using the diaries provided, participants recorded their routinised SUP consumption in the first week and their experiment of SUP avoidance in the second week. This allows an understanding of practices that involve SUP consumption and how they could be reconfigured without SUP using insights from the second week. We find that the way people commute, shop, eat and socialize has an impact on their use and challenges of avoidance of SUPs. We also find that most SUP products can be avoided, but this requires particular skills, equipment and systems of provision. Our findings suggest that reducing SUP would require systematic changes in everyday practices and consumption patterns.

Rethinking Reuse and Rebound with Attention to Everyday Circularity

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Despite the current emphasis on reuse as a key strategy for operationalizing more circular economic systems, some researchers have questioned the assumed environmental benefits of reuse. As Cooper and Gutowski, for example, wrote — “the environmental impacts of reuse have ...received little attention—the benefits typically assumed rather than understood” (2015:1). In this paper we draw upon our observation that environmental modeling studies—regardless of whether their findings suggest that reuse results in reduced or accelerated environmental impacts— make erroneous and unfounded assumptions about consumer behavior in second-hand markets. In scrutinizing these assumptions, our intent is not to provide another review of the literature on the environmental impacts of reuse practices, but rather to respond to calls for additional research on the behavioral dimensions of reuse and the associated implications for modeling environmental impact (Zink & Geyer 2017). In this paper we draw on a survey of more than 600 Maine households and in-depth behavioral studies of 30 households participating in reuse and resale markets to theorize “everyday circularities from a critical social science perspective” (Greene and Hobson 2022) and to empirically test the behavioral assumptions made by environmental impact models. We argue, based on our observations, that environmental analyses of reuse should not assume new goods are always preferred relative to used goods, even when taking money out of the equation, or that consumers participating in reuse markets are driven solely, or even primarily, by economic logics.

I06: Social Innovations as a Driver of Sustainability Transformations

Session Chair: Halina Brown

Room: B: Omnia, R: Momentum 2 (max. 30)

Transformative social innovation for climate change and sustainability: a country level stocktake of current and potential practice

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Social innovation literature envisions a central role for social movements and communities in driving and shaping climate and sustainability futures, supported by enabling policies and governance approaches (Wright, 2019; Schartinger et al., 2014; Henry et al. 2017). Social innovation is characterised as contributing to broader transformational processes in multiple ways; local community-based organisations act as ‘moral agents’ with the necessary local knowledge to guide innovation processes, accelerate investment and generate local capacity and platforms for broader consumer-facing sustainability initiatives, but also to generate the tangible benefits and public buy-in that have been observed to influence the stability and effectiveness of climate change and energy policy (Bain et al., 2016; Hvelplund et al 2013; Meckling et al. 2017; Roberts et al. 2018). Although social innovation has played an important role in specific country and technology-contexts, it has by no means played a widespread role in change processes to date. Together, these observations are increasingly resulting in a call to integrate social innovation into ‘transformative’ science, technology and innovation policy (Wittmayer & Avelino, 2019; Schot & Steinmuller, 2019).

In this study, we bring together social innovation, sustainable consumption and socio-technical transitions literature to identify potentially transformative social innovation initiatives in Aotearoa (New Zealand), with a view to identifying preconditions and prospects for wider diffusion and scaling. Although there exist similar attempts at documenting case studies in sustainability oriented social innovation with a view to understanding prospects for wider diffusion (see for example Schartinger et al., 2020), these reviews typically define sustainability oriented social innovation loosely without reference to the systemic origins of sustainability problems and the preconditions for sustainable consumption.

In this study we draw on SI, sustainable consumption and ecological economics literature to identify qualifiers for sustainability oriented SI, asking:

- What defines social innovations that can potentially contribute to a transition to sustainable systems of production and consumption?
- To what extent do these SI exist and in what form in New Zealand? Which actors and networks are involved?
- To what extent have the SI been embedded in New Zealand society through scaling up, replication, circulation or institutionalisation?

- What enables and constrains the ability of SI to become embedded in New Zealand context, and what are the policy implications?

To help us distinguish early, peripheral or unsuccessful SI from transformative SI, we apply a framework for the embedding of experiments (Turheim et al. 2018). Using our qualifiers to delineate the scope of our empirical analysis, we compile a database of potentially transformative social innovation initiatives in Aotearoa (New Zealand). From this we sample case studies purposively to set out a high level overview of SI practices, actors, networks, success and failure factors, as well as game changers and systems innovations presenting opportunities that can be leveraged to affect change.

Social innovations and their contribution to the circular built environment. Drivers and barriers to implementing and upscaling non-technical solutions.

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Rapidly rising urbanisation and the associated demand for new built environment (BE) – i.e., buildings streets, as well as urban green and blue infrastructure – contribute significantly to both material scarcity and climate change, accounting for about 40% of societal resource consumption (De Wit et al., 2018; Khasreen et al., 2009) and up to 40 % of global CO₂ emissions (WEF, 2016). Consequently, more sustainable construction practices are called for to not only mitigate resource scarcity but also climate impacts. One solution to that end is a circular BE.

Understanding the BE as a socio-ecological-technical system implies the necessity not only of technical innovations, but also of non-technical, i.e., social innovations (SI) to transition urban areas towards sustainability (cf. e.g. Ellen MacArthur Foundation, 2013; Marchesi & Tweed, 2021). SI re-innovate traditional planning, construction, and user practices in the BE by implementing new ways of doing, organizing, framing and knowing (Haxeltine et al., 2017; Pel et al., 2020); for instance by prolonging buildings' life cycles, using them more efficiently, or downsizing on material use.

However, the role SIs play for circularity in the BE is still underrepresented in scientific literature, leaving a gap this research aims to fill by answering several questions: What are SIs that contribute to the circularity in and of the BE? How can they be coherently compared? What are barriers, hindrances, and success factors for their upscaling? What influences does the respective (societal, economic, or governance) context have?

Through a systematic bibliometric and scoping review, this study identifies a variety of examples of SI that contribute to circularity in the BE one way or another. To provide an overview and compare the SI, a framework is compiled of existing models and classifications. The comparison shows that most SI, although benefitting ecological ideas, do not target circularity explicitly. Most SIs in this context focus on the design, construction, or use phase or of buildings, whereas SI revolving around building materials are barely mentioned, and focus on one of three main actor groups: community actors that initiate bottom-up movements (frequently related to new forms of using buildings); market actors offering and promoting new business models; and policy, or governance influencing the sector by implementing new guidelines or regulations. In other cases, circularity strategies are framed as SI themselves, indicating that circularity not only requires but means new ways of thinking, doing, organizing, and knowing.

Based on those insights, a case study design is compiled to gain knowledge on success factors, barriers, and hindrances of SIs in the BE in a real-world context. Empirical data collection was done using qualitative stakeholder interviews to complement a desk research. Findings from this study are relevant to scientists, practitioners and governance to help understand and foster SI on the way to transitioning the BE to circular practices.

Mapping (transformative) social innovations for a sustainable food system

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The food system is a complex socio-technical system encompassing a wide variety of people, places and processes along the globalized value chain. This continuous increase in complexity has also resulted in various social and environmental negative externalities. In reaction to the unsustainable developments of the mainstream food system, various social innovations have emerged aiming to transform – at least a part – of the food system towards more sustainability. Although scholarly attention for the role of social innovation in sustainability transitions has increased over the years, a more comprehensive overview of the variety of social food innovations and their role in socio-technical sustainability transitions is lacking so far.

In this paper, I am to address this gap and provide a mapping of social food innovations, focusing on the DACH-region. More specifically, social food innovations are understood as ""(combinations of) ideas, objects and/or activities that intentionally and targeted change social relations, involving alternative ways of organizing, doing and thinking food to challenge the dominant socio-technical configuration of the food system"" (adapted from Pel et al. 2020 & Wittmayer et al. 2022). Building on a large database of food initiatives in Germany, Austria and Switzerland, a typology of social food innovations is created. In this typology, the initiatives are distinguishing and clustered based on the type and goal of the innovation (i.e. what is being transformed) as well as the strategies and changes applied (i.e. how is the transformation pursued).

This mapping serves as a first step towards a more comprehensive overview of the alternative approaches aiming for a more sustainable food system. In this way, it enables an expanded understanding of the various types of social innovations and moves beyond the (current) focus on single initiatives. Additionally, it illuminates categories of social food innovations that have not received much empirical attention, while showing more systematically where overlaps and differences between the transformational approaches can be identified. Consequently, it provides the baseline for reflections on the directionality, potential and disruptiveness of current social food innovations and their role for the overall transformation towards sustainability in the food system.

The Model of Open Cooperativism: the Case of Open Food Network

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This presentation is part of the research program “Techno-Social Innovation in the Collaborative Economy”, funded by the Hellenic Foundation for Research and Innovation (H.F.R.I.) for the years 2022-2024. The presentation showcases the Open Food Network (OFN) as an open-sourced digital platform supporting short food supply chains in local agricultural production and consumption. The presentation outlines the research hypothesis, the theoretical framework and methodology of research as well as findings and conclusions.

Research hypothesis: The model of open cooperativism as a vehicle for systemic change in the agricultural sector.

Theoretical framework: Research reviews the OFN as an illustrative case-study of the three-zoned model of open cooperativism (Bauwens et al. 2019; Kostakis and Bauwens 2014). The OFN is considered a paradigmatic case of the model of open cooperativism inasmuch as it produces commons, it consists of multiple stakeholders including ethical market entities, and it is variously supported by local authorities across the globe, the latter prefiguring the mini role of a partner state.

Methodology: Research employs Ernesto Laclau and Chantal Mouffe’s discourse analysis - elements, floating signifiers, nodal points, discourses, logics of equivalence and difference - to analyse the breadth of empirical data gathered through literature review, digital ethnography, a survey and in-depth interviews with core OFN members. Discourse analysis classifies OFN floating signifiers, nodal points and discourses into four themes: value proposition, governance, economic policy, legal policy.

Findings: OFN floating signifiers align around the following nodal points and discourses: “digital commons”, “short food supply chains”, “sustainability”, “local”, “the elimination of intermediaries” and “systemic change”. The current research identifies a lack of a common ground of what the discourse of “systemic change” would imply on the premises of the OFN’s value proposition. The lack of a common mission may be detrimental to the formation of a common strategy that would be perhaps deemed necessary to bring about systemic change in agriculture.

Conclusions: Drawing on Laclau and Mouffe’s discourse theory of hegemony, research introduces a chain of equivalence by aligning discourses such as “agro-ecology”, “commons-based peer production”, “partner state” and “ethical market entities” under the model of open cooperativism, juxtaposed against the current hegemony of neoliberalism, which articulates discourses such as “market fundamentalism”, “privatization”, “green growth” and “the capitalist state” to promote corporatism and entrepreneurship. Research makes the case that for OFN to further agroecology and challenge the current hegemony of industrial agriculture, it is vital that it opens up its supply chains into equivalent sectors of the economy, civil society and politics to form a chain of equivalence linking together ethical market entities, the commons and a partner state around the model of open cooperativism.

I07: Fashion and Textile Consumption and Production

Session Chair: Stephan Wallaschkowski

Room: B: Omnia, R: Momentum 3 (max. 30)

Fashion Consumption Post-Pandemic Buying Restrictions: What has changed and what hasn't?

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Addressing the negative environment and social impacts of retail consumption has emerged as a major societal challenge in the last century, as people continue to over-consume and over-waste products in almost all categories. However, the Covid-19 pandemic, and its associated consumption restrictions, offered consumers an opportunity to reflect on their buying and using practices, prompting new consideration of what a product lifecycle might represent and what comprises 'needs' versus 'wants' in certain product categories. Whether the consumption restrictions imposed during the global pandemic resulted in long-term positive change regarding consumption is debated – some argue that the consumption 'break' experienced by many consumers resulted in increased consumption and waste post-pandemic. Others assert that the opportunity to examine key purchasing touchstones, such as local production and circularity of goods, has sparked renewed consumer awareness and interest in sustainable buying behaviours. This study examines the fashion consumption behaviours of 501 Australian and New Zealand consumers, asking participants to reflect on changes to their fashion consumption practice triggered by pandemic consumption restrictions. The study indicates some positive behaviour change regarding consideration of the locale of garment production and sustainability cues on garments, however impact on volume reduction appears limited. The presentation of this research will discuss some of the key demographic factors examined as part of the study, and their relationship to fashion consumption behaviour change.

Returning that T-shirt has environmental impacts

Rotem Roichman

Shira Shabtai

Vered Blass

Benjamin Sprecher

Tamar Makov

Presenter: Tamar Makow, makovt@bgu.ac.il (in person)

During the 2020 holiday season alone, US consumers sent more than one million products back to retailers each day(!). Consumer returns are a particularly challenging issue in e-commerce where as many as 20%-40% of all products sold are returned. While many consumers consider return policies to be a key factor in their purchase decisions, few seem realize that the products they send back don't necessarily make it back to the shelf. Instead, many returns travel through a complex reverse logistics supply chain, at the end of which some are resold via outlets and secondary markets at a fraction of their original retail price, while others are recycled, donated, or sent directly to incineration.

Beyond the added transport and waste associated with the post-return lifecycle stages, disposing of brand-new perfectly functional products also squanders the embodied materials and energy invested in their production and distribution. While the environmental impacts of eCommerce are well discussed, returns are seldom included in analyses. As a record number of households adopt eCommerce following the global pandemic, gaining a better understanding of the environmental implications of such a massive shift in consumption patterns is both timely and imperative.

Building on a unique dataset covering over 600,000 apparel items returned in the EU, semi-structured interviews with industry experts, and a comprehensive literature review, we use data-science methods and LCA, to map the flows of returned items across the post-return supply chain and assess the full lifecycle environmental impacts of product returns.

Our results suggest that the embodied impacts associated with producing items that are never used far surpass the direct emissions associated with transport, processing and packaging of returned product. To the best of our knowledge, this work presents the first attempt to quantify the environmental impacts of product returns from a full lifecycle perspective.

Post-purchase behaviour of fashion products of Generation Z consumers

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Presenter: Arifa Parvin Kemi, kemibrur@gmail.com (online)

Research at the Budapest University of Technology and Economics aims at uncovering the post-purchase behaviour of consumers of new and second-hand fashion products. First, a literature review was prepared on green fashion consumption by examining 104 articles published between 2011 to 2021. As a result, we outlined the research issues at hand, their key methodologies, related theories, and conclusions. Then, empirical research in the form of a questionnaire survey explored consumers' post-purchase behaviour of fashion products by addressing the factors and barriers influencing the consumers' reuse, repair, repurchase and recycling activities.

On-going research aims to better understand the sustainability implications of the new and used fashion markets and develop recommendations for regulation within the fashion industry. Our current research is based on a qualitative approach by establishing focus groups in order to further elaborate the results of the questionnaire survey. Focus groups are made up of Hungarian and international students belonging to Generation Z who live and study in Budapest, Hungary.

The focus groups will enable us to compare sustainable textile consumption behaviour and post-purchase behaviour of electronic products. The result will assist us in better understanding the specific behaviour and lifestyle of Generation Z consumers.

We expect to finalize the focus group research during the Spring of 2023, which will make it possible to complement our previous results obtained through quantitative analysis. This complex approach may assist policymakers and marketing experts in trying and understanding how Generation Z behaves at the post-purchase stage of consumer products.

I just prefer to buy new clothes! The stigma towards second-hand clothing and accessories acquisition among Spanish fashion consumers

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Presenter: Laurentina Junestrand, l.junestrandleal@fashion.arts.ac.uk (in person)

Spain is home to some of the leading retailers among one of the most successful business models of the fashion industry, fast-fashion (Blas Riesgo et al. 2022a; Niinimäki et al. 2021). This production-consumption model has received much criticism because of the lack of consideration of environmental and ethical issues, with fast-fashion becoming a matter of high concern in business, policy and consumer agendas mainly since the 90s (Niinimäki et al. 2020). However, even if Spain is a large contributor to the social and environmental impacts caused by fast-fashion consumption, it remains an under-researched geography in sustainable fashion consumption literature, and it is only recently that a few studies examining sustainable fashion consumption in Spain have appeared (Karaosman et al. 2015; Blázquez et al. 2020; Blas Riesgo et al. 2022a; Blas Riesgo et al. 2022b; Valor et al. 2021). Moreover, findings of sustainable fashion consumption research in Spain highlight that consumers tend to associate sustainable fashion with slow fashion made of ecological materials and without labour exploitation (Blázquez et al. 2020). This is a pattern that emerges from the literature, since all available studies have a tendency to associate sustainable fashion consumption with eco-fashion, slow fashion, ethical fashion or local fashion, leaving behind other alternative sustainable business models such as circular fashion alternatives (Blázquez et al. 2020; Blas Riesgo et al. 2022; Karaosman et al. 2015). Second-hand clothing consumption is a circular fashion consumption alternative that can bring environmental benefits given that its consumption replaces to some extent the consumption of the new, extends the lifetime of clothing and postpones the generation of textile waste (Farrant et al. 2010; Sandin and Peters, 2018). Second-hand clothing consumption has been widely studied in other geographies, however, there is no study exploring this type of consumption in Spain, the only research found explores the Spanish second-hand market exchange in the 18th century and infant second-hand clothing acquisition (Barahona and Sánchez, 2012; Hur, 2020; Peña-Vinces et al. 2020; valor et al. 2021; Xu et al. 2014). Empirical evidence on sustainable fashion consumption in Spain is very scarce. Therefore, this study asks: what is the current status of second-hand clothing acquisition in Spain?

The study situates second-hand consumption as a short-term transition strategy within a reconfiguration perspective (Geels, 2015). It looks at Ecological Modernisation Theory and the Multiple-Layer Perspective to explain the positionality of second-hand consumption within environmental theory (Buchel et al, 2022; Sondegård et al. 2004).

This paper aims to present part of the findings from a large-scale cross-country and cross-generational quantitative consumer survey conducted in 2022. It will present the findings from Spain, in which 298 participants took part, with a focus on the non-consumption of this type of clothing and accessories. The study contributes to expand the knowledge on sustainable fashion consumption in Spain, more concretely, circular fashion consumption and contextualizes second-hand clothing and accessories market exchange to the Spanish market.

The Effects of the COVID-19 Pandemic on Sustainable Fashion Consumption in Hong Kong

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Increasing unsustainable fashion consumption patterns have been contributing to the global climate crisis – exhausting nonrenewable resources, increasing greenhouse gas emissions, and requiring excessive amounts of water and energy. The COVID-19 pandemic has only further compounded these developments in many respects, with several consumers turning to cheaper sources of clothing without access to physical stores, clearing out closets only to end up with more textiles in general waste, and engaging in ‘revenge shopping’ once restrictions began to ease. However, there is also evidence of a rise in more sustainable consumer practices as a result of this unprecedented pause in industry and daily life due to COVID-19. Our study aims to better understand how the pandemic affected sustainable fashion consumption patterns in Hong Kong SAR – part of a top producer and consumer of textiles and apparel globally. We use a survey experiment implemented in 2022 to a nationally representative sample of Hong Kongers, randomizing whether respondents were primed to reflect about how COVID-19 affected their sustainable fashion consumption. Control and treatment groups were randomly assigned with equal probability, and all respondents then answered a series of outcome questions about their attitudes toward sustainable fashion consumption more generally. Further respondents answered a set of questions speaking to possible mechanisms by which the COVID-19 treatment may affect their thinking or behavior toward sustainable fashion consumption. We expect to find that Hong Kongers who reflect on COVID-19 will be more minimalistic, environmentally conscious, focused on longevity of textiles, and confident in their sustainable fashion consumption. We also expect that those who felt that changes to their fashion consumption habits were positive will be more likely to engage in sustainable fashion practices going forward. As such, this study has important implications for understanding how COVID-19 has affected patterns of consumption in the sustainable fashion sector, how this may apply to any future crises affecting consumption patterns, and how industry can more effectively respond to shifting consumer attitudes focusing on sustainability.

I09: Sustainable Consumption and Care

Session Chair: Stefan Wahlen

Room: B: Omnia, R: Spectrum (max. 30)

The purpose of the dialogue debate session is to delineate and differentiate the interplay between sustainable consumption and care. In order to live a good life and achieve well-being, a better understanding of the role of care will assist in understanding how we can maintain, continue and repair the world we live in. This dialogue-debate session would like to focus on the following question: How can we productively advance a dialogue bringing care into sustainable consumption and vice versa? The relationship of sustainable consumption and care has received some attention during recent years. For example, SCORAI Europe organised a workshop on this topic and the results of the workshop are currently being prepared as a special topic publication with frontiers.

Building on this previous work, we would like to continue our debate and delve a little bit deeper into a discussion by first asking about the current problematizations of the relationship between sustainable consumption and care. This might consider the role of care jobs as the basis for a green economy or how the relationship of care as well as environmental action is interdependent. After identifying the current issues at hand, this debate session would like to advance particular conceptualisations that are of use, not only to understand the problem at hand, but also to advance pathways towards better understanding of more sustainable consumption. For instance, does an ethics of care come across with a better understanding of ethics of justice. Or, what is the political character of everyday life when scrutinised from caring perspectives?

The session will consist of six panellists. Those panellists will prepare brief lightning talks to sparkle inspiration for the debate. Together with the audience, we aim at a lively debate among both, panellists as well as other people that are interested in the topic being present in Wageningen. In order to prepare the session the organisers are going to write an introductory contemplation during early 2023 based on our previous work. In a next step, panellists will reflect on (some) of these questions. Such a reflection should be around 1-2 pages and provided to the organizers during spring 2023. The reflections papers will be circulated amongst the participants in order to prepare for the session and to allow for a lively debate.

Line-up of speakers: Alex Bush, Oxfam abush1@oxfam.org.uk

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I10: Transformation as a response to an external shock: Covid as a case example (2/2)

Session Chair: Philip Vergragt

Room: B: Omnia, R: Quantum 3 (max. 30)

Attempts to transform lifestyles to be more sustainable have been proposed over many years but met with resistance and barriers maintaining that it would not be possible to harness public support for major changes to entrenched habitual patterns of consumer behavior. However, could an external major shock break down such resistance and barriers and enable significant changes to lifestyles to become acceptable?

Covid can be seen as a major disruptor, an external shock which caused great stress to many but also opened up opportunities for lifestyle change as people were forced to accept and adapt to lock downs, quarantines and social distancing. Responses varied widely between countries and communities depending on their ability to cope with constraints, their existing living conditions and infrastructures for mobility and according to social and cultural attitudes to work, home and family.

In this second session we will reflect on the outcomes of the case studies presented in session 1 and conduct an interactive discussion.

1. Philip Vergragt, (Clark University, USA): Introduction and summary of session 1
2. Janine Fleith de Medeiros and Arthur Marcon (UFRGS, Brazil): Covid-19 and lifestyle modification in Brazil: what do we know and how durable are the changes experienced?
3. Chibuzo David Onuoha (Okota, Lagos): COVID19-Pandemic and Changing Lifestyle: A Study of the Transformation in Food Production and Consumption in Nigeria
4. Valerie Brachya, (Jerusalem Institute, Israel): Did we lose the opportunity for more sustainable lifestyles?

Roundtable discussion

Covid-19 and lifestyle modification in Brazil: what do we know and how durable are the changes experienced?

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Presenter: Janine Fleith de Medeiros, janine@upf.br

The impact of Covid-19 was significant on the lifestyles of Brazilians across all social classes and in different dimensions. Before the pandemic, the home office was a reality for few companies, but a frequent request from several workers. With Covid-19, the model has become a necessity for businesses to continue operating. However, remote work in Brazil is not a reality for most workers. In numerical terms, only 11% of Brazilians worked from their homes in 2020. Currently, although Brazilians with telecommuting experience want to work from home two to three days a week, their employers have adopted, on average, 0.8 days of work from home per week. Hybrid work in the country is concentrated in large companies, especially multinationals, which does not happen in medium and small companies. Therefore, remote work is not a trend that has consolidated in the trans-covid period. Online shopping was accelerated by the pandemic caused by the new coronavirus, which drove consumers away from physical stores. In 2020, 301 million purchases were made online, an increase of 68.5% compared to 2019. The scenario that we find after the crisis presents evident differences. Today we have a much more digitized customer. Delivery sites like "Mercado Livre" have become a benchmark for efficiency and speed, and even companies like China's Ali Express promise to invest heavily in logistics to guarantee deliveries in up to 48 hours anywhere in Brazil. The impacts on housing in Brazil were significant and distinct. In the less favored social classes, many had to abandon their homes. Currently, this population has jumped from 158,191 in December 2021 to 184,638 June 2022. In social classes with greater purchasing power, house searches increased. Immune to the financial crisis, a portion of the population changed in a few months a consolidated trend in the real estate market. The preference for compact apartments, installed in condominiums in central neighborhoods and with enormous collective infrastructure, gave way to a preference for spacious residences located in more remote areas of the city. Now the demand is for space with lawn/green area and a beautiful view. According to data from a survey carried out this year, 62% of respondents pointed to a property with well-divided spaces as relevant, while 45% said it was important live in a house. Finally, with regard to leisure and entertainment, virtual activities were well supported by the population. Another perceived impact refers to the increase in numbers related to streaming services. However, it is important to highlight that in the trans-covid phase, leisure and entertainment activities out home grew exponentially. In 2022, 100% of the schedule of in-person events returned, which represents more than 590 thousand events in the year. In addition, domestic tourism grew by 5.8% in 2022. In this context, we can say that some changes tend to last longer than others, as well as that are different impacts on production and consumption systems, which must be analyzed.

COVID19-Pandemic and Changing Lifestyle: A Study of the Transformation in Food Consumption in Nigeria

Chibuzo David Onuoha, Okota, Lagos, chibuzonh@gmail.com

Presenter: Chibuzo Onuoha, chibuzonh@gmail.com

Like the previous global pandemics, such as bubonic plague and the 1918 influenza pandemic, COVID-19 affected various facets of human existence on a global scale, ranging from changes in lifestyle to work and consumption as well as migration and tourism. Extant studies on the impact of COVID 19 have downplayed the African experience. Those that have focused on Africa, even though tangentially, have focused on trade and travels with little attention paid to its impact on lifestyle, work and consumption. This study is, therefore, designed to correct the lopsidedness in the historiography of the effect of COVID19 pandemic by focusing attention on Africa, using Nigeria as a case. By so doing, it examines the impact of the Corona Virus pandemic on food industry in Nigeria, with a view to analyzing the changes in lifestyle, and sustainable transformation in food consumption which it engendered.

Primary and secondary sources provide data for the analysis. Personal observation and experience during the pandemic will be utilized.

Interviews will be conducted with purposefully selected respondents from four major cities across the six geopolitical zones, Lagos (south-west), Port Harcourt (south-south) and Enugu (south-east), Kaduna (North-west) Maiduguri (North-East), Lokoja (north-central) as well as Abuja (the Federal Capital Territory). The study is structuralist in approach, examining the Nigerian experience within the larger structure of global system.

The pandemic transformed the mode of consumption in Nigeria, most especially in food business. Consequently, various online food vendors emerged to deliver food to people's houses in the period of the lockdown. This change has been sustained and expanded even after the lockdown, as a good number of people consider it easy to order their favourite meals online and take delivery in the comfort of their homes, hostels, offices and workshops. They have, unlike before, got used to it, thus making it to become a new lifestyle. This has helped to migrate food production and consumption in Nigeria to online platforms and has reduced the cluster of people in restaurants. This transformation in food industry is novel because other online activities, such as online teaching and learning, occasioned by the pandemic has been unsustainable due to the challenges of critical information and communications technology in Nigeria. On the contrary, the online food business has not only survived, but has grown in leaps and bounds.

Although online business had existed in Nigeria before the pandemic, it was neither all-encompassing nor common in food business. The pandemic not only expanded online business in Nigeria, but it brought about the migration of food business online, which has crystalized into a sustainable lifestyle.

Did we lose the opportunity for more sustainable lifestyles?

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Transition to different lifestyles is usually an opportunity associated with a moment of change, to a different stage in life or as response to an external event, such as a crisis. The Covid pandemic, and the restrictions imposed on daily activities, was an opportunity for transition, as many people adopted different daily routines over a significant period of time. As other papers in this session show, some trends which evolved during the pandemic lockdowns and recovery periods are now becoming permanent features, generally those based on accelerated digitization. Other trends have dropped or were lost. This presentation will demonstrate with data from before and after the pandemic that we have missed the opportunity of taking advantage of a good crisis.

During the pandemic and the periods of lockdown and quarantine, lifestyles revolved around the home and the neighborhood. Travel was limited, daily commuting diminished, purchasing power dropped, mass entertainment was not available, gyms closed. Those who could, worked from home, found new social and community connections with people in close proximity, used local businesses and significantly increased walking and cycling and visiting parks. Street space was re allocated for people instead of cars. Business flights were replaced by Zoom, in store shopping by online purchasing and eating out by delivery services.

As recovery packages were rolled out and a new normal evolved, many returned wholly or in part to former commuting patterns but with more car dependency and less use of public transport. Street space which had been re allocated to pedestrians, cafes and active mobility was returned to the car and parking. Furthermore, those who could continue to work from home for all or much of their working time, either moved to attractive and less expensive residential or moved to larger properties in outer suburban areas, both trends generating urban sprawl, in complete conflict with promoting urban sustainability through compact urban development with high transit accessibility.

While there were significant differences between countries, possibly related to the availability of space in the home for comfortable remote work or to differences in social and cultural context, the results everywhere show that the new normal following the Covid crisis did not transition to a more sustainable lifestyle except where physical infrastructures embedded a more comfortable, convenient and affordable solution, such as safe segregated bicycle lanes. The stimulus packages were not green but promoted the consumer lifestyle to revive economic growth and to use savings made during the pandemic for purchasing goods and vacations.

Future research could analyze why we missed the opportunity for transition, what could be embedded in future stimulus packages and where changes in physical and institutional infrastructures could enable the continuation of positive transitions made during a crisis. The SCORAI working group on trans Covid will discuss these and other issues in relation to the pandemic and other crisis situations.

J: Saturday, July 8, 13.45-15.00

J01: Inclusive and Participatory Planning for Sustainable Consumption

Session Chair: Machteld Simoens

Room: B: Omnia, R: Quantum 1 (max. 30)

Youth Engagement in The Circular Economy to Improve Sustainable Development in Rural Areas

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The circular economy model has become popular and is gradually applied locally. Its implementation at the grassroots level is expected to support the Indonesian government in achieving SDGs (Sustainable Development Goals). For example, the implementation of waste management based on the 3R (reduce, recycle and reuse) model at the village level can empower rural communities to solve pressing environmental issues. The subjects of this research were the beneficiaries of the waste management program (TPS-3R) previously implemented at Jongbiru Village, Gampengrejo District, Kediri Regency, East Java Province, Indonesia. This study uses a qualitative approach with an employed case study by conducting an in-depth interview, FDG (Focus Group Discussion) and observation. The implementation of the circular economy model was performed by the youth who live in the village, some of whom are members of the local environmentalists and are university students carrying out an internship program. The research activities were carried out from March-October 2022. This research aims to elucidate the impact on youth engagement on circular economy initiative in rural area. The results showed that youth initiatives through 3R-based waste management (TPS-3R) could be integrated into the circular economy model at the village level. In this TPS-3R program, larvae from the black soldier fly (*Hermetia illucens*) were utilized to transform agricultural residues and domestic wastes into compost. The biomass of black soldier flies is processed into fish feeds while their carcass and exuviae are incorporated into the composts. This activity can benefit rural communities by forming village institutions in organic waste management, providing job opportunities, increasing community income, and stimulating diversified economic activities. In addition, the presence of the TPS-3R program changed the way people dispose of their domestic wastes, where wastes are collected and processed circularly at the village level by prioritizing sustainable village development. Overall, the outcome of this circular economy model can facilitate young communities in developing villages by promoting environmental sustainability.

Activity spaces and the urban environment: does neighbourhood greenness lead to lower travel emissions?

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Problem: We have already crossed the threshold of several planetary boundaries, indicating the urgency of climate change mitigation efforts to maintain favourable living conditions on our planet. Cities can play an important part, as urban areas are soon to be home to 66% of the global population. Cities cause about 75% of global energy-related CO₂ emissions. Previous studies have found that despite densification strategies to create more compact and car-free lifestyles, urban residents have higher GHG emissions than their rural counterparts.

Furthermore, despite having pro-environmental attitudes, urban residents take several long-distance trips annually, adding greatly to their environmental impact.

Aim: The aim of the study is to find out what are the connections between neighbourhood characteristics and people's mobility in the form of activity spaces, and how activity spaces connect to people's travel footprints.

Methods and approach: The study uses activity spaces as a method to investigate the impact of the urban environment on the mobility of people in Reykjavik, Iceland. Activity spaces describe the spatial and temporal dimensions of locations which people visit regularly. They provide an understanding of which urban spaces an individual interacts with on a regular basis and how.

Activity spaces and their connection to GHG emissions have scarcely been studied and have not been studied in Iceland at all.

The study is based on a softGIS survey conducted in 2017, in which people were asked to mark their frequently visited locations on a map. Local activity spaces in this study are calculated based on the individualised home range model (Hasanzadeh et al., 2017) and the individualised residential exposure model (Hasanzadeh et al., 2018), which have previously been applied in Finland using similar data. The data is analysed using geospatial and regression analysis.

Findings/conclusions: The study confirms results from prior studies which show that people in Reykjavik are highly mobile, which is evident when considering that most respondents have a polycentric local activity space (82%). The study also indicates that living in the suburbs does not strongly support locally centred lifestyles. As expected, a negative correlation between population density within 1km of the home and local activity space size was found. Interestingly, a positive correlation between greenness of neighbourhood and local activity space size was noticed. Furthermore, people with larger local activity spaces seem to have higher travel footprints. Cosmopolitan attitudes might be an underlying cause for these patterns, as found in previous studies in the same area. The study does not challenge compact urban form.

Implications: The study demonstrates the applicability of activity spaces in mobility-related GHG emissions studies, noting the need for further studies with more granular spatio-temporal data. Policies should support reducing cities' GHG emissions while meeting the day-to-day needs of people.

Energy justice during the 2023 crisis: understanding thermal comfort and shifting practices in Switzerland

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The war in Ukraine has had massive impacts on the European energy system and market. In Switzerland, energy prices have been increasing: the inflation for the consumer price index had a 16,2% annual growth rate in 2022. Moreover, if no shortages have occurred as of yet, the public discourses around a possible energy crisis have been significantly present and alarming, both by media and public institutions. The impacts of changes in prices, discourses and policies on energy-related practices and thermal comfort conceptions have to be questioned: to what extent has the 'energy crisis' shifted routines, and who has been the most impacted? This article presents the results of both in-depth interviews with household members (n=20) and real estate agencies (n=7), and a representative survey for Western Switzerland (n=500). By applying social practices theory, it analyzes and shows different adjustments in peoples' routines and understandings around heating, cooking, washing and more, but it also positions these changes in the energy justice and thermal inequities debate – with results showing social and spatial inequalities behind energy consumption and thermal comfort.

Energy justice within, between and beyond Dutch Flexibility Energy Communities

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In one of its most recent reports, the European Union's Joint Research Centre (JRC) called for a twin green and digital transition [1]. Digital technologies, the researchers state, can aid in moving towards a more sustainable society. This process should happen in a fair, inclusive and just way, which, according to the JRC, is the central challenge for the twin transition.

In our research, we analyze the justness in twin transitions, specifically focusing on flexibility energy communities.

We understand flexibility energy communities as energy communities that include a combination of distributed energy sources (DER) (e.g. distributed generation, energy storage, and controllable appliances) and a digital energy management system (EMS). The European Commission is generally supportive of and actively stimulates energy communities, as it perceives these communities as a way to progress the clean energy transition and increase flexibility in the energy system [2]. Strengthened by their digital technologies, flexibility energy communities have potentially greater opportunities to provide flexibility services to regional or national energy systems. At the same time, however, their combination of DER and digitization components can lead to specific justice issues.

Therefore, in this article we analyze the different justice aspects of flexibility energy communities. Energy communities can, but do not inevitably, lead to energy justice [3]. There are different analytical levels at which (in)justices caused by energy community development can take place: within the energy communities, between energy communities and related actors, and beyond energy communities [3]. Although most research in this area has so far focused on analyzing energy justice within the energy community, the increase and promotion of energy communities provokes questions regarding the impact of energy communities on the regional or national energy systems. In addition, due to their digitization components, specific energy justice impacts can come to the fore in flexibility energy communities.

The aim of this study is to explore justice issues within, between and beyond flexibility energy communities. First, an energy justice framework is developed, which is then applied to six Dutch and Belgium flexibility energy communities to both test our framework and to investigate the impact of flexibility energy communities on energy justice. Next, we reflect on what actions governments could take in reaction to these energy justice impacts when instrumentalizing and supporting flexibility energy communities. Finally, our study highlights that to successfully stimulate a just energy transition, we need a broader and more connected understanding of energy justice issues in the context of flexibility energy communities.

References:

[1] Joint Research Centre (European Commission), S. Muench, E. Stoermer, K. Jensen, T. Asikainen, M. Salvi, F. Scapolo, Towards a green & digital future: key requirements for

successful twin transitions in the European Union, Publications Office of the European Union, LU, 2022. <https://data.europa.eu/doi/10.2760/977331> (accessed July 25, 2022).

[2] European Commission, Energy communities, Energy - European Commission. (2020). https://ec.europa.eu/energy/topics/markets-and-consumers/energy-communities_en (accessed July 18, 2021).

[3] N. van Bommel, J. Höffken, Energy justice within, between and beyond European community energy initiatives: A review, Energy Research & Social Science. 79 (2021) 102157. <https://doi.org/10.1016/j.erss.2021.102157>.

J02: Food Production and Consumption: Regional & Justice Perspectives

Session Chair: Paul Kehinde Adeosun
Room: B: Omnia, R: Quantum 2 (max. 30)

The dimensions of food citizenship: A consumer-oriented approach for social change

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Individuals' food choices impact the planet and society, but only a portion of consumers is concerned with food-related aspects. Food citizenship emerges when people mobilize to access healthy, sustainable, and equitably produced food. This phenomenon is an exercise of rights and duties regarding the food system, which enables movements and initiatives that mitigate individual concerns about problems caused by traditional models of food provision. The present research, composed of three complementary studies, contributes to understanding food citizenship at the individual level, i.e., as consumer behavior. In Study 1, a measure of food citizenship is developed and tested with Brazilian consumers (n=329) using exploratory factor analysis, adding empirical insights into the studied behavior. In Study 2, the behavior change model based on information, motivation, and skills (IMB model) was used to support the search for factors that determine food citizenship in individuals. After familiarizing them with the food citizenship concept, this exploratory investigation implemented a projective technique with consumers (n=207). In Study 3, the same model (IMB model) allowed us to understand the antecedents of the individual's participation in a productive arrangement mobilized by food citizens: Community-Supported Agriculture (CSA). In addition, we conducted 17 in-depth interviews, which generated a descending hierarchical classification for each of the constructs of interest - information, motivation, and behavioral skills. The results revealed that the factors of Actions and Beliefs (Study 1) compose the food citizenship measure with 15 items. Those factors allowed the investigation of some meaningful relationships, demonstrating the potential of the scale for future research. In addition, we explored the 34 variables that integrate the information, motivations, and behavioral skills determining food citizenship (Study 2) and the 15 variables that precede the participation of individuals as part of a CSA (Study 3), both within the scope of the three constructs of the IMB model. Theoretically, the research contributes to advancing the understanding of food citizenship at the consumer level and expands the use of the IMB model in the food context. This behavior change model is promising not only to explain behaviors but also to support intervention proposals. From a managerial and social perspective, there are contributions to public policies and food citizenship movements or initiatives, as the studies increase the understanding of engaging more people in their purposes. Finally, we outline two unified frameworks, providing an overview of the studies and future paths.

The smaller the rural unit, the more systemic its transformation towards sustainable production must be

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Traditional rural units in developing countries, also called traditional farms, correspond mostly to micro, small and medium-sized enterprises (MSMEs). These have two main purposes: i) to serve as housing for the rural family, ii) to perform multiple small-scale agro-industrial activities, some for food production for own consumption. Although they are fundamental for socioeconomic development, often their obsolete technologies and highly polluting production processes, together with household pollution, contribute significantly to the deterioration of watersheds and ecosystems. Environmental programs based on narrow approaches, which consider farms as a series of isolated domestic and agro-industrial activities, end up providing partialized environmental solutions focused on certain activities; in this way, they do not achieve a profound environmental transformation, either circular or of the farm as a whole. Thus, environmental support programs for rural MSMEs continue to fail, unable to visualize and implement complementary and integrated environmental actions.

In this context, through an applied research project, we sought to develop innovative approaches, more systemic and integral, to guide rural MSMEs towards more sustainable and circular production models. Two small coffee farms in Colombia acted as the unit of analysis in the case studies; although they mainly produce coffee, other activities such as small-scale pig raising cannot be ignored. A series of technological prototypes and sustainable production practices were introduced on these farms, adopting broader approaches. The prototypes promoted active learning by allowing farmers to learn-by-doing and learn-by-interacting, overcoming their environmental weaknesses hand in hand with CP knowledge providers. Interviews, workshops and on-site measurements, direct participatory and systematic observations, and multi-stakeholder dialogues helped to collect and triangulate the empirical information provided by the cases.

It was observed that the application of complementary clean technologies between the various agricultural and domestic activities can lead the farms to more circular and sustainable production models. A significant reduction in water consumption in the coffee production process was obtained, as well as a high percentage of reuse and utilization of domestic and agro-industrial waste through composting and bio-digestion processes, and a mixed system for the treatment of liquid and solid waste. The implementations helped the farms to begin the process of categorizing as ecological coffee production. At the same time, green skills were developed in the farmers to produce bio-compost and natural gas, and their working and health conditions were improved, breaking down mistaken beliefs and barriers for the adoption of green practices. This study provides theoretical and empirical contributions on the field of environmental project management and dissemination of cleaner production and circular economy to rural MSMEs.

Sustainable consumption of water in cities: Opportunities and barriers by local authorities

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The coastal region of Slovenia, located in the Northern Adriatic, has for decades suffered from lower availability of water than the rest of the country. Nevertheless, much more than in terms of specific geo-climatic features, the dominant public narrative framed water scarcity here as a problem of insufficient water supply from the rest of otherwise water-abundant country. The solution was consistently vested solely in the construction of a bigger water supply system. The summer of 2022 put the region to an unprecedented test and eventually led to a severe crisis. This presented a window of opportunity to start designing also more sustainable water use in this region, and perhaps the country more widely, particularly in view of extreme droughts becoming more frequent in the future. The prospects for a change are being explored through various discussions and initiatives.

This paper explores the possibilities for the transition of cities towards more sustainable water consumption, as an instance of a sustainability transformation at the local scale. It uses the case study of four municipalities of the Slovenian coast to identify the causes for the transformative process, the options for a more considered use (and supply) of drinking water and the factors influencing the outcome. Barriers to success and enablers are discussed against the existing literature and local knowledge. Particular attention is placed on the role of local authorities, treating them as agents of change. In that context, governance measures are identified as well as their interaction with practices and initiatives developed by citizens, municipalities, farmers and key businesses in the local and national economy. The case study is approached with an interest for highlighting promising points of intervention by local authorities to leverage a transformative change.

The paper is explicitly problem-based and descriptive, and foremost part of an ongoing process. It characterises the societal context, in which the solutions are sought, assessing these against the tenets of the One Water approach. The starting point of the paper is to offer a nuanced analysis of the context, barriers and opportunities. Relevant bodies of literature are explored in order to consider their relevance in the present cultural and political context and to discover their utility in directing practical actions for the ongoing societal transition. As the contribution is embedded in an incomplete process, it cannot offer final conclusions or strategies. Instead, it is a practice-based and action-led input to a highly topical conversation about meaningful ways of introducing and accelerating transformative change.

Transformative capacity of local food initiatives

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There is growing activism among citizens, farmers and NGO's to transform the food system. The number and diversity of initiatives reconnecting farmers with their local and regional community and environment is increasing. It has been hypothesized that such initiatives which bypass the dominant global food system have great transformative potential and can change farmers' and citizens' practices and boosting social, environmental, and economic benefits. In more localized, community-oriented agriculture, farmers are no longer anonymous producers and citizens not only behave as consumers. Social, ecological and community values become important factors for food consumption. The main research question is which, how and under which conditions farmer-citizen interaction leads to transformative change.

We used food citizenship, diverse economies and three-folded embeddedness as theoretical concepts. We used questionnaires and interviews and performed a literature study to develop a typology for local and regional food initiatives based on degree of embeddedness, ambition and type of initiator and participation of different types of citizens. Questionnaires and interviews provided more in depth information about the characteristics of initiatives, their strategies and transformative power and the preferred values of participating citizens.

We found that direct interaction between farmers and citizens often leads to healthier consumption patterns and in some cases to more environmental friendly farming practices. Differences in citizen involvement (from classical consumer role to investing, food production and risk taking); in type and degree of embeddedness (value chain, socio-cultural and natural resources), performance and transformative capacity were interrelated. Performance and perceived challenges are related to the type of initiative. In most studies, these differences are overlooked leading to inconsistent outcomes of short food chain initiatives studies. Diversity should be taken into account for agricultural and food policies supporting short food chains, sustainable production and healthy food environments to be more effective.

J03: Sustainable Energy Production and Use

Session Chair: Oana Iliescu

Room: B: Omnia, R: Podium (max. 269)

A System Dynamics Model for Simulating Rebound Effects Induced by Energy Savings with Re-spending Scenarios

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Energy and resource efficiency are increasingly questionable approaches to achieving environmental sustainability. Decades of technological advancement haven't delivered the environmental-economic decoupling that they promise, and thus many accepted sustainability concepts – such as the circular economy, electrification, and smart agriculture – are undergoing a validity challenge (Mulrow et al., 2021; Mulrow & Santos, 2017). While it has been well-documented that rebound effects and ecological spillover are responsible for many broken sustainability promises, most studies of these effects are still limited by narrow system boundaries pertaining to single products or industries.

In this study, we develop and test a system dynamics (SD) model for estimating a diversity of re-spending scenarios, capable of simulating multiple rebound effects induced by efficiency savings. The model is aimed at understanding how different spending patterns of money “saved” through energy efficiency improvements impact carbon emissions in a modified STIRPAT model developed by York et al. (2003). The baseline SD model was built on the model developed by Wen et al. (2022) who created STIRPAT SD model for the carbon sector in China. The model we developed introduces the “carbon intensity” coefficients using a life cycle assessment (LCA) framework for different sectors in the STIRPAT SD model as a way of measuring the impact of different spending scenarios. This framework calculates the carbon intensity of re-spending through dominant carbon intensities for each sector (i.e., the use phase for flight sectors, production, and transportation for food sectors). In this study, we focused on re-spending because there is only a limited number of studies that focus on the impact of the induced demand on carbon emissions. The impact of re-spending on carbon emissions can be devastating as documented by Meshulam et al. (2022) who did a study on food-sharing systems and found that depending on the re-spending scenarios the carbon emission benefits achieved by food-sharing systems were reduced by 59-94%. This re-spending money comes through savings due to energy efficiency or energy intensity improvements in our modified STIRPAT SD model.

In this study, the re-spending scenarios are developed from the perspective of consumers generated using Consumer Expenditure Surveys with the idea of reflecting upon socioeconomic differences in consuming behaviors. The different spending scenarios include baseline, low-income, high-income, leisure-focused, and downsizing. The baseline scenario uses current average spending patterns while low- & high-income scenarios for consumptions reflect respective groups spending. Leisure focused scenario was developed with the assumption that when people save money they tend to spend this saved money on leisurely activities rather than

for more spending on necessities. A downsizing scenario represents little or no re-spending. The research question this study is trying to answer is: What is the impact of changing re-spending consumption patterns on carbon emissions on a system level?

The expected results of this study are to create a system dynamics model where rebound effects and their impacts can be understood concerning the re-spending decisions consumers might make. We hope to create a baseline framework and model for analyzing rebound effects quantitatively in a STIRPAT SD model.

References

- Meshulam, T., Font-Vivanco, D., Blass, V., & Makov, T. (2022). Sharing economy rebound: The case of peer-to-peer sharing of food waste. *Journal of Industrial Ecology*, n/a(n/a). <https://doi.org/10.1111/jiec.13319>
- Mulrow, J., Gali, M., & Grubert, E. (2021). The cyber-consciousness of environmental assessment: How environmental assessments evaluate the impacts of smart, connected, and digital technology. *Environmental Research Letters*, 17(1), 013001. <https://doi.org/10.1088/1748-9326/ac413b>
- Mulrow, J., & Santos. (2017, November 13). Moving the Circular Economy Beyond Alchemy. Discard Studies. <https://discardstudies.com/2017/11/13/moving-the-circular-economy-beyond-alchemy/>
- Wen, L., Zhang, J., & Song, Q. (2022). A scenario analysis of Chinese carbon neutral based on STIRPAT and system dynamics model. *Environmental Science and Pollution Research*, 29(36), 55105–55130. <https://doi.org/10.1007/s11356-022-19595-z>
- York, R., Rosa, E. A., & Dietz, T. (2003). STIRPAT, IPAT and ImPACT: Analytic tools for unpacking the driving forces of environmental impacts. *Ecological Economics*, 46(3), 351–365. [https://doi.org/10.1016/S0921-8009\(03\)00188-5](https://doi.org/10.1016/S0921-8009(03)00188-5)

Environmental impact analysis of woody biomass uses in the urban context

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Environmental impact analysis of woody biomass uses in the urban context

Cities and urban activities are major contributors to greenhouse gas emissions, an estimated 75% of the global CO₂ emissions arise in the cities according to the UNEP (1). Thus, cities constitute a focal point. They have great potential for action and results, by implementing emission reduction strategies, carbon drawdown programmes, or blue-green-grey infrastructure projects. On the path of urban transformation towards more sustainable practices, the current work aims to investigate the environmental impacts of bioenergy and biochar production from woody biomass.

These products have the potential to mitigate some effects of climate change but their impact on the environment is an essential step before implementation. Biochar production raises great interest in its carbon sequestration capacity both from companies and the local administration. Heat and electricity production from burning biomass has been seen as an alternative to fossil fuels, especially in the Nordic setting (2). Set in the Finnish context, the paper looks at two different biochar technologies as well as a typical bioenergy production facility by performing a prospective lifecycle assessment. The use scenarios are designed to include the emissions associated with the raw material procurement, the production process as well as waste management and co-product valorisation (cradle-to-gate model).

The paper also discusses resource management for woody biomass, the implications of directing the biomass towards biochar production on a city level, and what alternatives exist for energy production. It gives an overview of the current and future climate plans in Helsinki and several recommendations for developing policy. This research has its roots in a desire to provide a practical course of action for biochar production in the urban environment.

References

1. UNEP. Cities and climate change. UN Environment Programme - Resource Efficiency - Cities. [Online] 2022. <https://www.unep.org/explore-topics/resource-efficiency/what-we-do/cities/cities-and-climate-change>
2. Nordic Energy Research. Progress towards Nordic Carbon Neutrality: Tracking Nordic Clean Energy Progress. Oslo, Norway: Nordic Energy Research, 2020.

Shift consumption to save! Analysis of the dynamic price and demand response product offerings of Finnish electricity retailers during the energy crisis

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Demand response is an increasingly necessary part of electricity provision. In countries like Finland, wind energy is expected to be the dominant energy source by 2030. Tools such as market incentives and new electricity tariff models could encourage energy end-users to participate in demand response. However, this starkly contrasts a long-held assumption in the Finnish electricity markets. The retail electricity industry has not seen domestic customers as agile and questioned consumers' willingness to adopt electricity contracts based on dynamic pricing [1]. Finnish end-users have been considered comfort seekers, and dynamic pricing suitable mainly for a minority of technologically orientated customers. Hence, the retail market has been dominated by flat-priced electricity contracts.

The energy crisis in 2022 suddenly changed this situation. Contrary to all expectations, dynamic pricing was heavily promoted. While in May 2021, all types of contracts were widely available, in October 2022, one-third of companies had completely removed flat contract offers from their portfolio. Dynamic pricing, having been a curious option for a courageous minority of consumers, suddenly became the default, and all kinds of regular energy end-users were taught consumption monitoring, market price formation, and load-shifting.

This paper uses a time series of retail product portfolios and price data collected in May 2021, May 2022, October 2022 and May 2023, and three rounds of interviews with company representatives before and during the energy crisis. We study 1) the changes in understandings that retailers hold about the energy end-users and 2) the development of the business practices along these changes. We discuss the findings through their implications for day-to-day electricity use practises and sustainable consumption among regular Finnish households and on the future of electricity retail.

[1] Numminen, Sini, Salvatore Ruggiero, and Mikko Jalas. "Locked in Flat Tariffs? An Analysis of Electricity Retailers' Dynamic Price Offerings and Attitudes to Consumer Engagement in Demand Response." *Applied Energy* 326 (November 15, 2022): 120002. <https://doi.org/10.1016/j.apenergy.2022.120002>.

Conceptualising socially inclusive environmental policy: a just transition to Net Zero

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The climate crisis looms large behind the cost of living crisis, as a further threat to the wellbeing and good health of humanity. The policy area addressing the climate crisis in the UK, 'Net Zero', will affect many aspects of people's everyday life. Here we build on interdisciplinary research across social policy and environmental social sciences, to present a framework for conceptualising a just transition to Net Zero in the UK, along with some initial results from participatory research in low-income communities. Our framework emphasises the importance of starting with an understanding of the current challenges faced by many households and communities: it is critical to understand different starting points, in order to understand who is likely to be ready to participate in this transition. Taking a people-centred approach, we characterise the kinds of change that households and communities are likely to experience under Net Zero, noting that these have a wide-ranging affect on everyday life, across home life, to mobility, employment, and leisure. We then articulate the opportunities and barriers to participation in Net Zero, by adopting and modifying the Bristol Social Exclusion Model's (B-SEM) four arenas of participation required for social inclusion (economic, social, employment education and skills, and political). We elaborate these different forms of participation with some examples from our fieldwork in low-income communities in Leeds and Newcastle. We finish by making some recommendations for policy in this area, including the need to work across departments to help vulnerable households and communities engage in this agenda.

Comparing citizens perceptions of renewable energy technologies for an inclusive and transparent transition

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The relational and socially constructed dimension of social acceptance (SA) of renewable energy technologies (RET) is recognised, yet quantitative studies are still piecemeal. How informed people are about energy technologies is accepted as a key factor for community acceptance of new renewable energy projects. However, comparisons of how citizens across different socioeconomic and age backgrounds are informed about and trust different renewable energy technologies (e.g., solar, wind onshore and offshore, green hydrogen) are still lacking. There is equally little quantitative evidence on whether issues such as the scale of the projects (i.e., installation size) of different RET, the speed of their implementation, and their perceived potential for helping to tackle energy poverty, as well as other social, economic, and environmental benefits, affect SA and citizens support for these technologies. Against this background, this study draws on two interrelated research questions:

How do different factors, including direct factors (i.e., type of technology, speed, and scale of implementation, the proximity of installation, degree of information, and participation in the project) and indirect ones (concerns with climate change, biodiversity and habitat losses, and with energy poverty), as well as personal characteristics (i.e., age, gender, socioeconomic status) affect SA of RET?

What indicators can be used to measure SA of RET from a relational and socially constructed perspective?

To address these questions, the study relies on a representative survey (n=500) of Portuguese citizens collected in December of 2022 to investigate how direct, indirect, and personal factors result in different degrees of social acceptance, and what technologies citizens consider most promising. Portugal offers a good case study due to its large investments in renewable energy technologies, including plans for producing green hydrogen, its potential for a significant expansion of solar energy, including small and large-scale projects, and new plans for both onshore and offshore wind energy. Portugal has also a high vulnerability to climate change impacts and a high degree of energy poverty, which makes it a good case study to explore how citizens' concerns with climate change and energy poverty may influence SA of RET.

The survey draws on a stratified sample design according to age and gender, based on recent census data, and was created through a random sampling data collection process. The results are analysed using Pandas (a Python library programming language) to determine key factors for SA of solar, wind (offshore and onshore), and green hydrogen technologies, based on citizens' degree of information, trust in the technologies, preferences on the speed of the implementation and on the scale of new energy projects. These factors equally account for citizens' concerns with climate change, with protecting biodiversity and local habits, and with energy poverty. Key conclusions aim to contribute to new policies that support higher levels of energy literacy on RET, particularly new technologies such as green hydrogen (found to be the least accepted and trusted), as well as policies that foster openness and transparency in the implementation of RET and their potential social, economic as well as environmental benefits to society at large.

J05: Everyday Circularities: Rethinking Consumption in the Circular Economy (3/3)

Session Chair: Mary Greene, Kersty Hobson

Room: B: Omnia, R: Auditorium (max. 108)

Apartments as excluded and arrhythmic spaces in the urban waste regime

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Taking the example of recycling in apartments, this paper argues that paying heed to rhythms of urban waste can provide insights into how the waste burden can be justly distributed. In Australia, as in other owner-occupier, suburban based societies, housing is an essential locus for the domestic waste regime, and apartments are anomalies that disrupt it. Overall, recycling rates are lower in apartments, and comingled stream contamination rates are relatively higher. Rather than assuming this is a product of household behaviour, we take the starting point that there are certain dynamics at play that make apartments incompatible with normalised waste regimes. We examine waste practices through the concept of institutions and rhythms, confronted as they are by shifting rules and infrastructures. Thus, institutions are practice organisations that are "polyrhythmic, eurhythmic complexes of practices capable of absorbing arrhythmia, and at the same time being made up of precisely those disruptions and collaborations as they fade and absorb into each other" (Blue 2019, p941). We illustrate that the process and practices of waste consumption and disposal in urban apartments are temporally bounded, non-linear and characterised by 'rhythmic crises'. Moreover, this has implications for zero waste justice – the uneven impacts of attempts to intervene in governance to bring about 'zero waste. The practice based spatio-temporal rhythmic framework, in which recycling is analysed as a social practice and apartments as the site of the social, applied here leads to two main insights regarding the institutionalisation of waste in apartments, and the application of practice theories in urban studies:

- 1) Dynamics of rhythms present challenges for purposive attempts to intervene at various scales of waste-governance, including but not limited to, in the case of apartments, the concepts of verticality, density, and transient living.
- 2) The spatio-temporal dimensions of more than material, more than human and more than waste relationships and complexes require more attention in the governance of apartment waste and in urban research and theoretical development.

Reference:

Blue, S. (2019) 'Institutional rhythms: Combining practice theory and rhythmanalysis to conceptualise processes of institutionalisation', *Time and Society*, 28(3): 922-50.

Ethical consumption and perception of sufficiency: A comparative study in Sweden and Iran

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Ethical consumption involves adopting consumption practices that demonstrate a sense of responsibility towards society and the environment. Within the realm of ethical consumption, two forms have been acknowledged: consumption refinement and consumption reduction. These two approaches are implemented through diverse practices such as boycotting, buycotting, fair trade, and second-hand buying (refinement), as well as embracing simpler lifestyles, minimalism, and sufficiency (reduction). However, the effective realization of these ethical concerns relies on several factors, including the social context in which they emerge, supportive policies, infrastructures and resources, and the cultural backgrounds of the individuals involved. These factors function differently in different societies. This article aims to explore the diverse dynamics of ethical consumption in two distinct societies: Sweden and Iran. By analyzing these two contexts, we can gain insights into the variations in cultivating ethical consumption practices within each society. Additionally, the article investigates the interplay between ethical consumption and sufficiency in these societies, while also highlighting the potential lessons that consumers in each society can learn from one another. Data was gathered from 34 semi-structured interviews with consumers in both countries. Participants were asked questions focusing on two main themes: (1) patterns and practices in pre-consumption, consumption and post-consumption stages; (2) the influence of cultural norms, regulations, infrastructures, and technology on participants' consumption practices. Our analysis contributes to knowledge about how social structures (re)produce and define different interpretations of ethical consumption. It also highlights the role of social structures and cultural norms in shaping or preventing sufficiency-oriented practices, such as renting, reusing, and repairing goods. Finally, we will argue that although ethical consumption is a well-established concept in Sweden, it is more focused on consumption refinement rather than implementing a reduction in the amount of consumption. In contrast, the dominant perception of ethical consumption in Iran is the other way around, prioritizing the maintenance of balance in consumption.

The Challenges of Citizen Participation in the Circular Economy: Insights from the Finnish Context

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Understanding how citizens can participate to circular economy (CE) in their everyday life is essential for developing targeted policy measures that enable circular lifestyles. In the context of Finland, recent studies have shown that citizens tend to perceive participation in CE primarily through recycling and shopping second-hand. Our study challenges this perception by illustrating the practices of eco-influencers and other active citizens in Finland that have been trying to implement zero waste lifestyles and responsible consumption principles relevant to CE. Our data is a combination of qualitative semi-structured interviews with the pioneering “circular citizens” (n=20) and a follow-up nationally representative survey (n=1000) with regular citizens in Finland. Drawing on the insights from qualitative interviews, we identify the challenges that citizens experience while trying to reuse, repurpose and repair things or simply reduce their own consumption. These different challenges are related to market and infrastructure impediments, as well as to prevailing societal norms. Further on, we explore the scale of identified challenges using a quantitative survey regarding regular citizen practices of reuse and repair, as well as the availability of CE-relevant services. The results of our study are illustrative of the misalignment between the national vision of speedy CE transition in Finland, the availability of services and the current citizen involvement in CE practices. For instance, the limited availability and convenience of renting/leasing services for different types of goods do not allow for dematerialization, i.e. the envisioned evolution of consumers into users of services. Furthermore, the search for package-free alternatives is often a complex puzzle of timely online orders and visits to several physical stores that might have the re-fill or buying-in-bulk options. This is especially evident in smaller towns, where business owners may need additional incentives for starting to trade package-free. In addition, the perceived lack of time is often preventing citizens from updating their skills related to circularity. The ABC-theory by Guagnano et al. (1995) emphasizes the importance of context (C) over attitudes (A) in guiding sustainable behaviours (B). The results of our study suggest that everyday circularity is currently hampered by the challenges related to infrastructure and general lack of awareness related to circularity. Catalyzing circularity calls for integrative approaches: improving infrastructure and changing attitudes and norms via engaging experiences and social interaction. Based on the results of our study we propose a number of municipal level and educational interventions for enabling circular consumption patterns in the Finnish context.

Circular economy in the textile industry: consumer attitudes and behaviour

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Textile industry as one of the biggest polluters, especially during production of primary materials and manufacturing of final products, is gaining attention by governmental policies, as well as producers and consumers. To decrease sectors dependency on resources and minimizing related environmental impacts circular economy approach is one of the tools to achieve desirable results. Next to the environmental regulations and voluntary commitments of the different actors throughout textile value chain, the role of consumers is undeniable. Though so far in most cases focus on textile recycling is laid down and proper sorting of textile waste is encouraged, reuse of textile products (clothes) would be a more desirable option. Therefore, this study aims to analyse the frequency of different reuse options among Lithuanian consumers. So far survey covers 157 respondents, approached by internet and social media to take part in the survey in the beginning of 2023. Most of the respondents are young women (78.3%) from large towns (66.6%) with higher education (63.7%). Preliminary results indicate that most often known options for the clothes reuse is selling them on internet (special platforms, Facebook groups) and giving away for charity organizations. Creation of new products is less familiar option. Regarding purchasing second hand clothes, most often (38.2%) respondents indicated to do that occasionally. The main reason for purchasing second hand clothes is lower price. The main reason not buying second hand clothes is time consuming search of such shops and products. Handling of unnecessary clothes most often includes giving away for various organizations, selling on internet or occasionally exchanging clothes. Nearly half of the respondents say they never remanufacture clothes, majority of them only seldom repair clothes or make something new from unnecessary clothes and their waste. More than a half of the respondents never throw away unnecessary clothes to the municipal waste containers, however, 12.7% also have never used textile waste containers with majority sorting textile waste only seldom or occasionally. The latter could be explained by rather weak textile recycling system in Lithuania, and only developing net of textile waste containers in urban areas as well as low awareness of such possibilities. Regression analysis will be employed to reveal factors behind different reuse behaviours and give suggestions for awareness raising and circular economy implementation in the textile industry from the consumer perspective in Lithuania.

J06: Sustainable Consumption Governance

Session Chair: Halina Brown

Room: B: Omnia, R: Quantum 4 (max. 30)

A global policy index to create healthy, equitable and environmentally sustainable food systems at national and local levels.

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Problem statement: Global food systems are behind substantial negative consequences for human health, the environment and biodiversity. Transitioning to healthy and sustainable food systems is challenging given that one-size fits-all solutions do not exist.

Research questions/aim: To address these challenges, we propose the use of a food systems policy index to benchmark governments' actions towards healthy, equitable and sustainable food systems. This new index will be applicable for at national and local levels. This project aims to inform good practices that can be used to design and implement policies.

Theoretical approach, methods/inquiry approach: Through a compilation of international recommendations, a scoping review, four regional workshops with food policy experts, eight country-based policy mappings and policy stakeholder interviews, the International Network for Food and Obesity/NCDs Research, Monitoring and Action Support (INFORMAS) aims to create a new Food Systems Policy Index to monitor governments' actions on sustainable food systems. The tool will take into account the impact of policy indicators on obesity/non-communicable diseases, undernutrition and environmental sustainability. Two secondary outcomes (nutrition inequalities and women's empowerment) will also be considered.

Findings: International policy recommendations were classified and merged into two policy domains (food supply chains and food environments) and ten subdomains that impact nutrition-related outcomes, nutrition inequalities, and environmental sustainability outcomes. Their effect has been assessed both in a scoping review and through a survey with international food, agriculture and environmental experts. Four workshops with experts were organized (two in Africa, one in Europe, one in Latin America) to agree on the indicators with double and triple-duty potential to improve sustainable food systems and healthy diets. A mapping of policies and interviews with national and local policy stakeholders from eight countries in Africa is being conducted to pilot test the policy index.

Conclusions: The new food systems index will provide an up-to-date overview of evidence-based policies on sustainable food systems. The index will represent a useful tool for national and local governments to track malnutrition in all its forms, nutrition inequalities and climate change.

Practical and scientific implication: Given the heterogeneity, complexity and unpredictable nature of food systems, one-size fits-all solutions cannot exist. In this abstract we outline the INFORMAS 2.0 project, that aims to create a new policy index to benchmark governments' actions towards healthy, equitable and sustainable food systems. We envisage this as a mean to inform policymakers the to design and implement policies that ensure healthy and sustainable diets for the population.

The impacts of circular economy policies on tourism and leisure: a case of policy incoherence?

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There are increasing concerns on the unsustainability of tourism and leisure as any economic benefits may be outweighed by their social and environmental impacts, including greenhouse gas emissions, habitat loss, resource depletion. The attractiveness of tourism destinations is already being affected by environmental impacts. Although tourism is a service industry, it relies on extensive natural resources flows within linear business models (Manniche et al., 2021). Tourism actors participate in spatially dispersed global value chains, while tourism seasonality and the transient nature of the tourist experience influence consumer behaviour and the tourist attitudes towards more sustainable choices. Moreover, tourism suffered extensive disruption due to the pandemic; however, the return to the "tourism as usual" model would fail to address the environmental challenges. The paper examines how circular economy policies could support the adoption of circular practices by tourism SMEs in coastal areas in Western Europe (Belgium, France, Netherlands, UK) considering that circular economy policies and related targets often overlap or clash with targets in other policy domains such as tourism, construction or waste management.

The design of tourism policies needs to support the transition from linear to circular business practices (Einarsson and Sorin, 2020). Tourism has been relatively overlooked in circular economy action plans. However, tourism is affected by regulatory changes regarding food waste, food packaging and circular accommodation since tourism activity increases food consumption (restaurants/take-out food) and accommodation demand. Policy compliance will require change in business models, operations and consumer behaviour. Besides national governments, regional and local authorities can support SMEs to comply with or plan for regulatory changes. It is established that tourism policy overlaps with policies regarding transport, land use & housing, food, waste management (Haxton, 2015). Drawing on the concept of policy coherence for sustainable development (Nilsson et al., 2012) it is questioned to what extent circular policies could be coordinated across industries and levels of governance to enable circular tourism. The methodology includes a review of the policy literature regarding tourism, food & packaging waste and circular accommodation/sustainable construction. Survey data from tourism SMEs regarding barriers to the adoption of circular practices in their business are also included. The data suggest lack of knowledge on circularity policies despite available support. A more accessible support structure involving local authorities is proposed.

Einarsson S. and Sorin, F (2020). Circular Economy in travel and tourism: A conceptual framework for a sustainable, resilient and future proof industry transition , CE360 Alliance.
Haxton, P. (2015), "A Review of Effective Policies for Tourism Growth", OECD Tourism Papers, No. 2015/01, OECD Publishing, Paris, <https://doi.org/10.1787/5js4vmp5n5r8-en>
Manniche, J., Larsen, K. T., & Broegaard, R. B. (2021). The circular economy in tourism: transition perspectives for business and research. *Scandinavian Journal of Hospitality and Tourism*, 21(3), 247-264.

Nilsson, M., Zamparutti, T., Petersen, J. E., Nykvist, B., Rudberg, P., & McGuinn, J. (2012). Understanding policy coherence: analytical framework and examples of sector–environment policy interactions in the EU. *Environmental policy and governance*, 22(6), 395-423.

Implementation of sustainable development in local communities - Danish experiences

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Problem statement: I would like to contribute to a discussion of how to bridge the gap between researchers, administrators, businesses, policy makers, local citizens.

Research questions/aim: I would like to illustrate the gap and the bridge building with the collaboration and the research efforts that we have developed together with a number of municipalities in Region Zealand - especially Solrød Municipality. The focus will be both on the collaboration that has taken place and expectations for new collaborative projects in the coming years up to 2030.

Theoretical approach: The effort has been broadly oriented, and included both mitigation of climate change; adaptation to climate change; transition to a circular economy, sustainable use and protection of marine resources, protection and restoration of biodiversity and ecosystems.

Methods: The research has been and is interdisciplinary and largely the so-called modus 2 research (context-oriented, problem-focused and interdisciplinary).

Practical and scientific implications: During the course of time, a number of different forms of cooperation have developed between the university and the municipality, the companies and the local population, which I would like to present as part of a discussion of concrete ideas, methods and examples.

The role of sustainable business networks in promoting a circular economy

Tawanda Collins Muzamwese, University of Twente, Netherlands

Presenter: Tawanda Collins Muzamwese (in person)

In order to achieve transition towards a Circular Economy (CE), multiple stakeholder partnerships are required. Although concept of the Circular Economy shows proven potential and impact, the implementation is still very low in developing and transition countries. The research focuses on the role of networks in promoting the Circular Economy and also assesses the impact which network participation has on the implementation of a CE at company level. Although firm level capabilities can be enhanced by network participation, a lot of knowledge gaps exist regarding the orientation and structure of networks; governance model for networks and the high impact activities that can be implemented. A systematic literature review was undertaken based on keyword focus on networks, circular economy, collaboration and sustainable business networks. In addition, case studies from developing countries were assessed from 3 developing countries (Zimbabwe, South Africa and Kenya) and 2 from multinational global networks, in order to understand the contextual factors that influence the adoption of CE measures under a collaborative regime. Emerging findings point out to various cognitive factors influencing the proliferation of Sustainable Business Networks on CE. Leading cognitive factors which influenced adoption of CE and network participation included legislative forces, market pressures, mimetic pressures, isomorphic pressures of organisations wanting to conform to how other firms are practicing CE as well as other ulterior motives such as gaining public relations mileage. The research discusses the legitimacy of some of the motives as varied amongst countries depending on the contextual legal, competitive and market pressures as well as their ability to influence sustainability measures. The research concludes that Sustainable Business Networks are enablers of CE transition in developing and transition countries through network participation activities, knowledge generation, knowledge exchange, information dissemination and capacity buildings. However, cognitions and barriers acting upon the network actors have an ability to influence the level of impact. The research further concludes that transition towards a circular economy will be anchored on effective collaboration between and amongst firms in order to scale-up their firm level capabilities.

Enhancing environmental sustainability through reforming the consumer sales law

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Originally European consumer law was framed for boosting the internal market and welfare. Main aim of the consumer legislation was “through the achievement of a high level of consumer protection, to contribute to the proper functioning of the internal market.” However, since the growing awareness of planetary boundaries and climate change, consumer habits acquired a different accent in the European lawmaking. To ensure the European Union’s commitments to the UN Sustainable Development Goals, a more sustainable single market for businesses and consumers had to be achieved. Although the first packages of Sustainable Consumption and Production targeted only production, slowly but steadily consumer legislation opened up to this trend. The new Consumer Directives, which should re-draft and modernise consumer sales law were the first steps towards enhancing environmental sustainability in consumption. Ensuring longer durability of consumer goods via longer guarantee periods, and software updates, and enabling consumers to require repair are the two mentioned aims of the Directives to encourage more sustainable consumption patterns and a circular economy. This presentation will investigate how far the implementation of by Member States, with a special focus on the Czech Republic, has contributed to these aims. Using the methode of legal comparism, after a brief explanation of why promoting sustainability is a binding target for the European and national legislator (1), and why citizens’ capacity for sustainable consumption is limited (2), national best practices which are designed to improve sustainability through contract law in other European countries will be presented (3), and finally, it will be analysed how far the Czech transposition of the 2019/770/EU Directive ensures these targets (4). Finally, I will address unresolved consumer issues, which must be urgently tackled in the near future to achieve changes in consumer habits (5).

J08: Informality: a reality check on the food systems transformation agenda

Session Chair: Alejandro Guarin

Room: B: Omnia, R: Momentum 1 (max. 30)

In most low- and middle-income countries (LMICs) food systems are dominated by informal production and trade networks: these are small-scale, reliant on family labour, operating outside or on the margins of government regulation, based on staples, and local or regional in scale. While “modern” production, processing and retail also exist in LMICs, informal food systems are by far the most important sources and channels of affordable food security and nutrition for low-income populations, as well as a major source of employment and livelihoods, especially for women. Despite this, the informal sector is generally side-lined from policy, investment, and decisions, as it is often perceived by policy makers as a drag on modernization and economic transformation.

Informality has been mostly absent from the international agenda on food systems transformation. The goal of transforming food systems towards more sustainable models of production and consumption is globally relevant, but there is a risk that its conceptual development and implementation are framed by the problems and priorities of high-income countries, where formal enterprises and institutions prevail. The current agendas of sustainable production and consumption –including its levers of change – are not well suited to settings where food production, wholesale, and retail are dominated by informality.

In September 2022, a group of academics and practitioners met at the Bellagio Center to discuss “food systems of the poor” (FSP) –the idea that the informal networks on which low-income rural and urban households depend have distinguishable structures, operations and outcomes. We proposed an agenda for research and policy that would help to recognise the importance of FSP, engage constructively with its actors, and invest in their future. We would like to use the SCP conference session to test, expand, and enrich the idea of food systems of the poor. To properly recognise and engage the informal dimension of food systems we need to bridge the academic-practice divide, and develop new type of partnerships between decision-makers, researchers, businesses and civil society organisations. We recognise there are multiple communities working on food systems transformation, each with their own disciplinary, theoretical, and practical approaches.

We propose a dialogue session to bring these different voices and perspectives to this debate. We would like to explore how informality is understood and approached by different stakeholders, and discuss innovative ideas for evidence generation, partnerships, and policy. In the session we will bring a mix of academic perspectives on informal food systems along with the views of NGOs, grassroots organisations, and donors.

Line-up of speakers: Sigrid Wertheim-Heck, WUR, sigrid.wertheim-heck@wur.nl

Alejandro Guarin, IIED, alejandro.guarin@iied.org

Joost Guijt, WCDI, joost.guijt@wur.nl

J09: Spirituality, meditation, and sustainable consumption

Session Chair: Philip Vergragt

Room: B: Omnia, R: Momentum 2 (max. 30)

Content: Sustainable consumption and lifestyles are most often approached from a technological, social-psychological, or political perspective. Our basic assertion is that overconsumption and unsustainable lifestyles are embedded in a society and culture that is focused on growth, materiality, and instant gratification. Much less attention is given to the spiritual dimensions of activities and society.

A small group of SCORAI practitioners is exploring the spiritual dimensions of our lives and consumption. We do that in a non-academic way by discussing our own explorations; and also through joint meditation and reflections. In this session we will briefly present the group's activities to date and conduct a brief meditation session followed by a round of reflections by participants.

Everyone is welcome, especially those with no previous experience in this area.

The provisional program is:

- Brief introductions of the group's activities by Ian Hamilton, Ruben Nelson, David Chittenden and Philip Vergragt
- Meditation led by David Chittenden
- Round of reflections and follow-up ideas

A sign-up sheet will be provided for any post-conference feedback and communication.