

Net-zero ambitions: does the emergence of the norm present a shift to more effective climate governance?

By

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Abstract

Recent net-zero emission announcements of states appear like a positive turn in global climate governance. However, uncertainty regarding the meaning thereof exists as institutionalized mechanisms governing these ambitions are lacking. Therefore, this research aims to provide a deeper understanding of the politics surrounding net-zero pledges. Conceptualizing the net-zero concept as a norm while adopting a constructivist perspective, this thesis analyses the policy discourse to a) trace the evolution in meaning of the net-zero norm, b) explore processes of norm localization in Sweden, China and Fiji, and c) assess transparency and accountability embedded therein. The analysis reveals large variations in norm interpretation and policy implementation, which are mirrored in transparency and accountability dimensions. Transparency issues arise from qualitative targets that only indirectly contribute to emission reductions, which diffuse China's and Fiji's accountability for ambitious climate action. Additionally, the norm localization in China lacks absolute emission reduction targets before 2030, and Fiji constructs emission reduction conditional on international financing. In contrast to such intransparent standards for international accountability, Sweden displays higher levels of transparency. These are furthered through national relations of accountability established through an independent body evaluating climate policy. In summary, this thesis shows that without mandated universal standards, diverging interpretations exist regarding the meaning of the net-zero norm and displayed transparency, which impedes on accountability. The research also finds states capturing the norm for advancing self-interest, which requires critically questioning the potential of global norms for ambitious and effective climate governance.

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List of abbreviations

Action Plan for 2030	China's Action Plan for Carbon Dioxide Peaking Before 2030
BAU	Business As Usual
CBDR	Common But Differentiated Responsibilities
CBDRC	Common But Differentiated Responsibilities and Capabilities
CDR	Carbon Dioxide Removal
CH₄	Methane
CO₂	Carbon Dioxide
COP	Conference of the Parties
EKC	Environmental Kuznets Curve
ER	Emission Reductions
ESR	Effort Sharing Regulation
EU ETS	European Union Emissions Trading Scheme
GHG	Greenhouse Gas
IPCC	Intergovernmental Panel on Climate Change
IR	International Relations
Long-Term Strategy	Sweden's Long-Term Strategy for Reducing Greenhouse Gas Emissions
LT-LEDS	Fiji's Low Emissions Development Strategy 2018-2050
Mid-Century Strategy	China's Mid-Century Long-Term Greenhouse Gas Emission Development Strategy
MW	Mega Watt
N₂O	Nitrous Oxide
NCCP	Fiji's National Climate Change Policy
NDCs	Nationally Determined Contributions
SIDS	Small Island Developing Countries
UNFCCC	United Nations Framework Convention on Climate Change

1. Introduction

1.1 A changing climate in global climate politics: net-zero pledges

Climate change is one of the biggest challenges for humanity in the 21st century. Yet political commitment by states to reduce greenhouse gas (GHG) emissions has been notoriously low in the history of climate negotiations (Battersby, 2017; Carattini et al., 2019). Recently, however, states worldwide are announcing ambitions of striving for net-zero emissions (Climate Action Tracker, 2020), which appears like increased ambition to address climate change. This change from low ambition expressed in small emission reduction commitments to higher ambition of reducing emissions to net-zero is reflective of the larger regime shift in the institutions governing climate change. Key differences between the Kyoto Protocol (1997) and the Paris Agreement (2015) relate to the type of goals and targets, the scope of states responsible for achieving said goals, the degree of compulsion and the nature of the governance process (Oberthür, 2016; Weikmans et al., 2019). The goals in the Kyoto Protocol were mandatory emission reductions targets for developed countries that were determined in a top-down process. Rather than establishing country-specific emission reduction targets, the Paris Agreement sets out a global temperature goal of limiting climate change to well below 2°C and pursuing efforts to contain mean global warming to 1.5°C above pre-industrial levels. The implied emission reductions states need to achieve are not mandated from above but subject to voluntary pledges in the form of nationally determined contributions (NDCs) in a bottom-up process (Oberthür, 2016; Weikmans et al., 2019). Additionally, the Paris Agreement states that achieving its long-term temperature goal requires balancing the sources and sinks of global emissions, or in other terms to reach net-zero emissions, by mid of the century.

Due to the voluntary and bottom-up nature, the recent wave of net-zero pledges can be seen as a legacy of both the governance mechanisms of the Paris Agreement and its salient objective of net-zero emissions. However, the Paris Agreement does not oblige states to achieve net-zero emissions but rather appeals to them to strive for net-zero emissions. Therefore, the goal of net-zero emissions does not present an institutionalized formal rule. The fact that states nonetheless adopt net-zero targets reveals an implicit but shared expectation among states that they ought to strive for reducing their emissions to net-zero in order to mitigate climate change. Based on this ‘oughtness’ rather than political obligation, this thesis conceptualizes the wave in net-zero pledges to indicate the emergence of a prescriptive norm that sets the standards of appropriate behavior by states (Finnemore & Sikkink, 1998). What exactly this appropriate behavior entails in practice remains, however, unclear, as the Paris Agreement does not determine official standards to define this norm. Thus, without clear governance structures in place, the space of the net-zero norm remains largely ungoverned and thus open for ambiguity and interpretations (Fuglestedt et al., 2018).

Consequently, uncertainty regarding the actual meaning and their policy implementation surrounds these net-zero pledges. Without institutionalized structures governing the net-zero norm, transparency in national norm adoption by states becomes ever more crucial for holding states internationally accountable for ambitious climate action. Next to concerns about transparency and accountability, this also raises questions about the effectiveness of the net-zero norm for successfully limiting climate change to a mean global warming of well below 2°C. Important aspects relate to how states interpret and engage with the net-zero norm, and how much responsibility states assume for achieving net-zero emissions on the global scale. This leads to the overarching question and motivation of this research: does the surge in net-zero pledges, which seems to indicate that global climate politics have finally taken a positive turn, correspond to increased ambition to mitigate climate change and present an actual shift in the climate regime to more effective governance?

1.2 Absent governance structures: challenges for transparency and accountability

Many governments, including those of states that are responsible for large shares of emissions such as China, the US and the European Union, have recently announced the goal of striving for net-zero emissions (Climate Action Tracker, 2020). Whereas the Paris Agreement installs net-zero emissions as a principal goal in the climate regime to limit mean global warming to well below 2°C (Healey et al., 2021), it does not establish a centralized definition with associated standards to regulate and coordinate the individual pledges made by states. Consequently, without governance structures and clear principles set by an international institution, this vagueness in the net-zero norm gives room for different conceptualizations (Rogelj et al., 2021). As states are not obliged to follow specific rules for defining their ambitions of net-zero emission, key parameters including the emissions covered, timeframes and interim targets are open for interpretation. Pathways and policies for implementing these ambitions are also not specified, which allows relying on alternative strategies next to emission reductions (ER). However, alternative strategies such as measures for carbon dioxide removal (CDR), meaning the capture of carbon dioxide already emitted to the atmosphere, and market mechanisms to trade and offset emissions to other states do not reduce emissions and thus do not address the issue of climate change at its roots. Moreover, the vague definition of the net-zero norm makes it difficult to compare states' ambitions (Fuglestedt et al., 2018; Rogelj et al., 2021), and to assess and evaluate whether these ambitions suffice for achieving the global temperature goal. Therefore, the vague definition of the net-zero emissions norm without governance structures in place that force states to be specific about their ambitions potentially creates problems of ambiguity. Not only is this in contrast to transparency, but it also raises concerns about the possibility of holding states accountable for effective action to mitigate climate change based on their net-zero pledges. As for the bigger picture, this consequently requires examining the potential of international norms like the net-zero norm for governing environmental issues including climate change.

1.3 Definitions: transparency and accountability

In the environmental governance literature, transparency is conceptualized as making information derived from the etymological meaning of ‘seeing through’ (Gupta & Mason, 2016). Transparency thus means the disclosure of information (Mason, 2019) as well as visibility and greater openness, which present the opposite of secrecy (Gupta et al., 2020). Key questions in the transparency literature are what is made transparent, by whom information is made visible, for whom and why (Gupta & Mason, 2016). Both in the general governance literature and the field of global climate governance, transparency is often assumed to enable holding states accountable for their action or inaction (Gupta & van Asselt, 2019) and thereby contributing to more effective climate governance and improved outcomes (Gupta et al., 2020; Gupta & Mason, 2016). Accountability, in turn, is defined as “holding authoritative actors both answerable for their actions and also subject to evaluation and redress by those affected by them” (Mason, 2019, p. 99). This involves the first dimension of answerability, which describes the right of ‘account-holders’ to demand justification for action and inaction from ‘accountors’. It also includes the second dimension of enforceability that refers to the means of realizing accountability and the required capacity of penalizing and sanctioning non-compliant behavior (Gupta & van Asselt, 2019; Karlsson-Vinkhuyzen et al., 2017).

1.4 Research objectives

The overarching motivation of this research is to provide an enhanced understanding of the politics surrounding net-zero pledges and to explore the impacts of the recent surge in net-zero pledges on the climate regime, with the ambition of drawing insights on the effectiveness of the norm for governing climate change. This research aims to critically examine net-zero pledges, which at first seem like a positive turn with the potential to solve the issue of global climate change, in order to assess whether the superficial increase in states’ ambitions is mirrored in a shift to a more effective climate regime. Based on the lack of a universal definition and governance structures, the aspects of transparency and subsequent accountability serve as guiding principles in evaluating the impacts of states’ engagement with the net-zero norm. Specifically, this overarching aim is composed of the operationalized objectives

- 1) To trace the evolution of the net-zero norm along its life cycle from the origins in science to the uptake in politics and policy.
- 2) To analyze and compare how norm entrepreneur or norm leader states engage with and interpret the net-zero norm.
- 3) To analyze and compare how these states implement the net-zero norm into policy.

1.5 Research questions

Relating to the research objectives, the research questions that inform the subsequent research effort are the following:

- 1) What is the evolution of the net-zero norm and its meaning from its origins in science to its uptake in international climate governance?
- 2) How do norm entrepreneur states interpret the net-zero norm?
- 3) How do norm entrepreneur states adapt the net-zero norm and implement it into practice?

1.6 Scope and limitations

A first limitation in the scope of this research concerns the subject of interest to be studied, as this thesis focuses on the engagement of state actors with the net-zero norm. Various other actors in the private sector also adopt the net-zero norm, which is increasingly used in product and company advertisements (Rogelj et al., 2021). However, this research focuses on state actors in the international community, as states are responsible for setting national policy agenda and steering society. States determine the frame and structures for other actors, limiting and restricting their choice (Gach, 2019). Thus, states are understood as the central actors for governing responses to climate change within this research. Besides that, the present research necessarily focuses on a limited set of state actors only. To date, a plethora of states has announced net-zero commitments (World Resources Institute, 2021). Some states, however, can be understood as early adopters and norm leaders who shape the subsequent uptake and conceptualization by other states. Therefore, this thesis focuses on a subset of states identified as early norm adopters and investigates their approach to net-zero emissions.

A second limitation relates to the theoretical framework chosen to study the wave of net-zero pledges by states. The theory of the norm life cycle as developed by Finnemore & Sikkink (1998) has received criticism from more recent scholarship for its linear conceptualization of the processes of norm emergence and diffusion (Acharya, 2004; Petersen, 2018; Wiener, 2020; Wunderlich, 2020). Nonetheless, this theory was considered useful for analyzing the emergence and spread of the net-zero norm in the global climate regime, as it allows for identifying relevant actors in the creation and the mechanisms in the diffusion of the norm.

1.7 Road map

The thesis proceeds as follows. The second chapter lays out the theoretical framework used for studying the net-zero norm. It starts by explaining the general constructivist approach of studying norms for shaping states' behavior. After that, it lays out the theory of the norm life cycle, which informs the analysis of the emergence and diffusion of the net-zero norm at the international level. The theoretical chapter concludes by explaining the theory on norm localization, which guides the analysis of how states interpret and implement the net-zero

norm in the national context. The third chapter provides the methodological approach of the research, which consists of a discourse analysis focusing on policy documents and is complemented by semi-structured interviews, using the tool of qualitative coding for data analysis. The fourth chapter presents the empirical results for the first research question of the norm emergence and meaning in the early stages of its life cycle. The fifth chapter analyzes how the early norm adopting states Sweden, Fiji and China interpret and implement the net-zero norm into their domestic context in processes of norm localization, thereby addressing the second and third research question. In the sixth chapter, the findings of the three norm localizations are compared and contrasted, including a discussion on the transparency aspects and resulting accountability implications of these norm localizations. After integrating the empirical results and establishing links to the broader theme of norms in international climate governance, the conclusion answers the research questions and offers recommendations as well as avenues for further research.

2. Theoretical framework

The theoretical lens used in the analysis of the net-zero norm in international climate governance is informed by constructivist norm theory (section 2.1). This includes the theory of norm life cycles and norm entrepreneurs (section 2.2), which strongly influenced the early field of norms research in international relations, for answering the first research question. The theory of norm localization (section 2.3), which complements the theory on global norms and their life cycles by focusing on local processes of matchmaking, will be used to guide the answering of the second and third research question.

2.1 Constructivist approaches to IR focusing on norms

Constructivist perspectives on the international political system emerged as a critical response to the neorealist and neoliberal institutionalist theories of International Relations (IR). These perspectives that dominated academic scholarship of IR differ in their understanding of the nature and the influence of anarchy for international cooperation between states (O'Neill, 2009). The neorealist perspective focuses on the distribution of material power and capabilities for explaining the nature and outcomes of the international political system. Neorealism states that anarchy in the international system arises from states' behavior being motivated purely by self-interest to achieve relative gains in economic or military terms. This causes conflict instead of cooperation and highlights the influence of power distributions for shaping the outcome of institutions (O'Neill, 2009). In contrast, the neoliberal institutionalist perspective emphasizes the interdependencies of states in the international political system. It assumes a more positive view on cooperation, which is seen as difficult but not impossible to achieve. Neoliberal institutionalism focuses on institutions as essential factors in regimes that enable cooperation between states and thereby contribute to absolute and joint gains (O'Neill, 2009). Both neorealist and neoliberal institutionalist perspectives are problem-solving perspectives seeking to explain the outcomes of cooperation between states.

On the other hand, constructivist perspectives belong to the critical perspectives that interrogate the underlying structure and motivation that produce the international political system, rather than aiming to explain the behavior of individual actors. Constructivism focuses on problem framings, norms and values as these shape actors' interests and their interrelations, and thus determine the nature of political regimes and the resulting character of cooperation (Björkdahl, 2002). Constructivism holds the assumption that human interaction is not primarily shaped by material but by ideational factors, which shape and give meaning to behavior, and thereby construct interests and identities of actors (Jung, 2019). Constructivists argue that reality is socially constructed, as social context and framing matters for how humans understand the world, rather than objective knowledge (Lövbrand, 2014). Consequently, norms and ideas are one of the essential concepts in constructivism that have significantly shaped the study of international relations (Engelkamp & Glaab, 2015).

Especially norms have received much attention, because they serve as an analytical tool to explain the motivation for the behavior of states beyond purely material factors. In their origins in the social sciences, norms are “collective expectations for the proper behavior of actors with a given identity” (Katzenstein, 1996, p. 5). Hence, norms define the standards for acceptable behavior and thereby guide and restrict the behavioral choices of actors (Björkdahl, 2002). In the field of IR, norms “set standards for the appropriate behavior of states” (Finnemore & Sikkink, 1998, p. 893) which “delineate the scope of a state’s entitlements, the extent of its obligations, and the range of its jurisdiction” (Raymond, 1997, p. 128).

In the field of environmental governance, norms have received distinct attention for analyzing how issue framing shapes actors’ understanding of environmental problems. As this includes the factors and actors seen as creating the issue and those seen as solving it, norms shape the nature of cooperation and solutions (Bernstein, 2002). Therefore, norms are seen as influential in determining the content of regimes and how environmental issues are governed (Biermann & Pattberg, 2008). Overarching norms in the governance of environmental issues, sometimes referred to as ‘environmental meta-norms’ or fundamental principles, set the standards of appropriate and expected behavior by states required for safeguarding the environment (Lawless et al., 2020; Wiener, 2020). Such environmental meta-norms include the protection of biodiversity and the protection of ecosystems (Lawless et al., 2020), sustainable development (Biermann & Pattberg, 2008), or the mitigation of climate change.

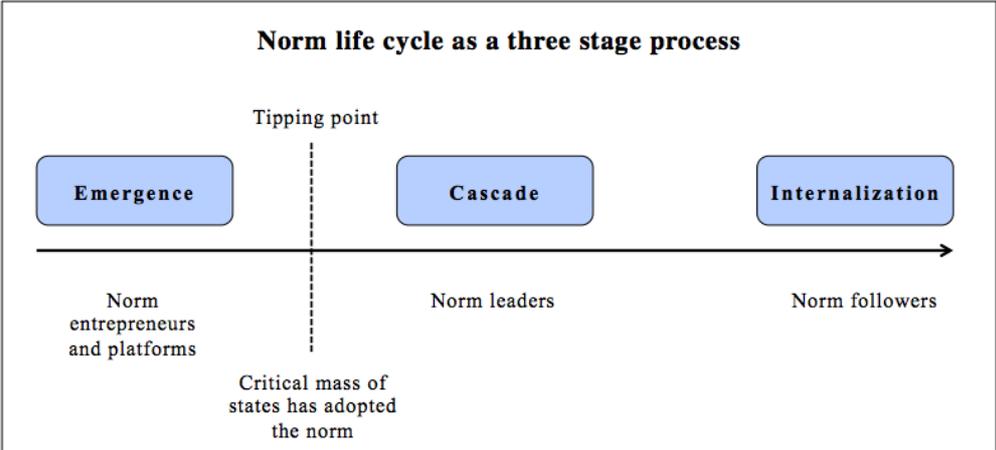
In the climate regime, the overarching meta-norm is to prevent the worst impacts of climate change and restrict climate change to safe levels, which functions as an organizing principle (Wiener, 2020) to guide the behavior and action of states. The net-zero norm directly relates to this meta-norm, as it presents the operationalization of the overarching ambition into a policy target. Without mandatory obligations for states to implement net-zero ambitions into their policies and mechanisms to enforce compliance, this thesis argues that the adoption of net-zero ambitions by states is best analyzed from a constructivist perspective. This is because the constructivist perspective allows for incorporating the influences of ideational factors such as problem framing and construction of knowledge.

2.2 Norm life cycle and norm entrepreneurs

But how do such norms emerge and how do they evolve? Critics of the constructivist study of norms have stated that norms are able to explain stability but criticized that norm scholarship has been less apt to explain dynamics and change (Finnemore & Sikkink, 1998). In response to these criticisms, Finnemore & Sikkink (1998) developed a model of a norm ‘life cycle’ that distinguishes three critical stages in the evolution of norms in order to explain how shifts in ideas and norms translate into system transformation (Figure 1). In the first stage, the ‘norm emergence’, actors attempt to persuade other actors to adopt a new norm that is not yet established in the current system. As these actors attempt to persuade others and to influence the norm structure, they are also referred to as ‘norm entrepreneurs’. When these norm entrepreneurs are successful in persuading a critical mass of states, a tipping point is reached

and the norm transitions into the second stage, the ‘norm cascade’. In this stage, the new norm is adopted and imitated by an increased number of states, referred to as ‘norm leaders’, as they attempt to exercise leadership and induce other states to follow with norm adoption. In the last stage, the ‘norm internalization’, the formerly new norm has been internalized by many states and is not object of much deliberation or contestation anymore (Finnemore & Sikkink, 1998).

Figure 1. The norm life cycle, based on the theoretical model developed by Finnemore & Sikkink (1998).



The concept of norm entrepreneurs has sparked interest among scholars who study norm emergence and diffusion. Norm entrepreneurs are the actors that are critical for the emergence of new norms, as they call attention to issues or even create new issues through their way of interpreting and (re-) framing them (Finnemore & Sikkink, 1998). These norm entrepreneurs use their social power to advocate for new standards of appropriateness in order to mobilize support from other states (Ingebritsen, 2002). Norm entrepreneurs depend on organizational platforms from which they act to promote their norms and to interact with other states on the issues their new norm addresses (Finnemore & Sikkink, 1998). However, norm entrepreneurs do not create these new norms in a vacuum but in a “highly contested normative space where they must compete with other norms” (Finnemore & Sikkink, 1998, p. 897).

Applying the theory of the norm life cycle and norm entrepreneurs to this research of the net-zero norm is useful because it allows analyzing the apparent change in the climate regime from low ambition to more ambitious pledges. It also allows for identifying relevant actors in this norm emergence and highlighting their means employed to advocate for the net-zero norm and a shift in how the problem of climate change is being understood and addressed.

2.3 Norm localization

Finnemore & Sikkink's (1998) theory of the norm life cycle belongs to the so-called first wave of norm research (Wunderlich, 2020) with a "classic 'norm socialization'" (Petersen, 2018, p.1) perspective. This research stream focused on the emergence and diffusion of global norms, which were perceived as 'moral' or 'correct', through the efforts of transnational advocacy networks acting as norm entrepreneurs (Finnemore & Sikkink, 1998; Petersen, 2018). Whereas this theoretical approach set influential and important directions in norm research in international relations, it is less apt at explaining differences in the interpretation and variation in the implementation of global norms at the local level (Acharya, 2004; Clapp & Swanston, 2009; Wunderlich, 2020; Zwingel, 2012). This is because it treats norm diffusion processes as binary outcomes of either rejection and resistance, or full compliance and internalization of the global norm (Eimer et al., 2016; Petersen, 2018).

In critique to this idea of unambiguous norm socialization (Petersen, 2018), a new stream of norms research emerged. This new research direction focuses on the processes of norm translation, contestation and adaptation in local contexts. It was initiated and highly influenced by Amitav Acharya's theory of norm localization (2004). This theoretical lens goes beyond the dichotomy of resistance versus acceptance, as it focuses on how global norms are interpreted and implemented differently in diverse local contexts (Acharya, 2004). Acharya defines norm localization as "a complex process and outcome by which norm-takers [who are actors adopting international norms] build congruence between transnational norms (including norms previously institutionalized in a region) and local beliefs and practices" (Acharya, 2004, p. 241).

Central to norm localization are the fit of the new international norm with the existing domestic normative structure, the processes that build congruence between the two, and the scope within international norms for these processes of matchmaking (Acharya, 2004). First, the existing normative structure determines the fit of the new external norm with the domestic context. Yet, whereas some scholarship has simplified norm diffusion outcomes as either acceptance or rejection based on the element of normative fit, norm localization theory does not subscribe to this strictly dichotomous distinction. Rather, it treats the degree of normative fit as the reason for the subsequent processes of congruence building (Acharya, 2004; Winanti & Hanif, 2020). Second, congruence building between the new external norm and the existing normative structure by domestic actors leads to localization of the norm, meaning the adaptation to the local context. Local actors, so-called 'norm takers' (Acharya, 2004, p. 241), engage with the external norm in a process of matchmaking through the mechanisms of framing and grafting. Framing refers to the construction of cognitive links between the new norm and existing norms. Grafting denotes the partial norm transplantation to associate the new norm with already existing and similar norms in the same issue area, selecting those elements that fit the normative structure or are made fit through framing and rejecting those elements that do not fit (Acharya, 2004). In other words, as there will hardly ever be complete alignment between external norms and the domestic normative structure, processes of norm localization fill the lack of congruence between international norms and domestic interests,

which might even change the meaning of the norm (Eimer et al., 2016; Winanti & Hanif, 2020).

However, norm localization is not merely a pragmatic response to international political pressure or international norms. It is also motivated by prospects of strengthening the existing local norms and increasing the authority and legitimacy of norm-taker agents without fundamentally changing their identity (Acharya, 2004). Norm takers might be motivated to localize new and external norms in order to strengthen existing norms through the “infusion of new ideas” (Acharya, 2004, p. 247) when the new norm appears more adequate for addressing newer challenges. Additionally, localization is motivated when norm takers perceive external norms as instrumental for enhancing their authority with “new pathways of legitimation” (Acharya, 2004, p. 246).

Without precise and strict mechanisms in place that govern the realization of the net-zero norm by states, the net-zero norm remains ambiguous and thus open to interpretation. Using the theory of norm localization to analyze how the net-zero norm relates to the preexisting normative context and how it is (re)constructed to build congruence thus enables insights into how states interpret and implement the net-zero norm, and to explain the variation in norm interpretation.

3. Methodology

3.1 Methodological approach

The overarching aim of this thesis is to shed light on the recent wave of numerous net-zero pledges by states. This phenomenon is striking as it seems like a shift from the historically low ambitions and pledges, which have led to the characterization of climate change as the ultimate cooperation problem (Barrett & Dannenberg, 2012; Battersby, 2017; Carattini et al., 2019). Due to the vague definition of the net-zero norm at the international level and the lack of mechanisms governing this concept, there is a high degree for potential interpretation and variation in the uptake of this norm (Fuglestedt et al., 2018). Therefore, the research problem at hand that this thesis aims to answer concerns the meaning of the net-zero norm. This also includes the change in meaning over the course of the norm life cycle due to the deliberation by different actors.

But this thesis does not conceptualize and analyze meaning in terms of concrete impacts on emissions as a quantitative evaluation employing forecasting and modeling would do. Rather, this thesis understands meaning in a constructivist sense. Consequently, it looks at how meaning is assigned to the global net-zero norm and how the norm is in turn (re-) constructed to establish certain meanings and effects, therefore adopting the methodological approach of discourse analysis (Miles, 2012). As this thesis is located in the broader research area of meta-norms for environmental governance (Lawless et al., 2020), the focus lies on the construction of meaning, including processes of contestation and deliberation. Analyzing the construction of meaning enables an enhanced understanding of the practical implications of norms to govern environmental challenges. That is because norms and discourses frame environmental issues. Norms thereby shape our understanding of these issues and in turn affect our solution strategies as well as their impacts on the environmental issue at hand (Lövbrand, 2014). Hence, adopting this qualitative research approach using discourse analysis presents a useful tool complementing and contextualizing quantitative efforts that scrutinize states' net-zero pledges.

Discourse analysis presents a form of qualitative data analysis that distills meaning from written or spoken language in relation to the social context it is embedded in. As such, discourse analysis differs from content analysis, which also presents a qualitative research method but is more systematic. Content analysis is governed by rules and predetermined, theory-dependent coding categories that take single words or phrases as the unit of analysis (Mayring, 2004). Discourse analysis, on the other hand, is grounded in the theoretical perspective of constructivism and constitutes a more interpretative research method to relate language with its social context (Miles, 2012). The goal of discourse analysis is to derive the contextual meaning of and the intended effects of language through analyzing collections of phrases and texts rather than individual words (Flick et al., 2004; Parker, 2004). Through this, discourse analysis moves beyond the technical pieces of language (Miles, 2012).

To perform the discourse analysis and distill the contextual meaning of the net-zero norm in its origins in science, its uptake in international climate governance and its adaptation to national policies, primary qualitative data in the form of texts was chosen for collection and analysis. A central issue in the study of international norms is the empirical conceptualization thereof and the often only indirectly observable evidence. Due to this, norms and their influence can best be studied in the form of norm-induced patterns of behavior including the discourses and rhetoric addressing a particular behavior (Björkdahl, 2002). Therefore, this thesis focuses on the policy documents and laws produced by states as evidence of their engagement with the net-zero norm and the construction of meaning thereof. Additional semi-structured interviews with experts (see Appendix A and Appendix B for further information) complemented the discourse analysis but were not the main research method employed.

3.2 Data collection

To trace the life cycle of the net-zero norm and to consequently identify relevant documents for analysis, the short overview of the net-zero politics developed by Black et al. (2021) served as an initial starting point. From this overview, the Fifth Assessment Report by the Intergovernmental Panel on Climate Change (IPCC), including its Summary for Policymakers (IPCC, 2014) was identified as the first major document explaining and advocating for the net-zero norm in the international political arena. Therefore, this Summary for Policymakers was selected for analyzing the emergence and meaning of the net-zero norm in science. To trace the diffusion of the norm in the political arena of the international climate regime, the Paris Agreement (UNFCCC, 2015) was selected for analysis. The Paris Agreement is the first document to frame the concept of net-zero emissions as a requirement for achieving the long-term temperature goal of limiting climate change to 2°C and striving for only 1.5°C global warming. Thus, the IPCC's Summary for Policymakers and the Paris Agreement were collected as the primary data and together served as the text documents for answering the first research question.¹ Additionally, a semi-structured interview was conducted with an academic expert on December 16, 2021 in order to gain complementary understanding of the knowledge production processes within the IPCC. The interviewed expert has broad knowledge on the IPCC, evidenced by their research papers on this topic. The list of proposed questions was based on the theory of the norm life cycle and can be found in Appendix A. The interview was video recorded and automatically transcribed using the conferencing software MS Teams.

To identify norm taker states who are early adopters of the net-zero norm and would serve as data for answering the second² and third³ research question, the Climate Watch Net Zero Tracker database (World Resources Institute, 2021) was consulted. The database provides an overview of the net-zero pledges by states. This includes the time the pledge was

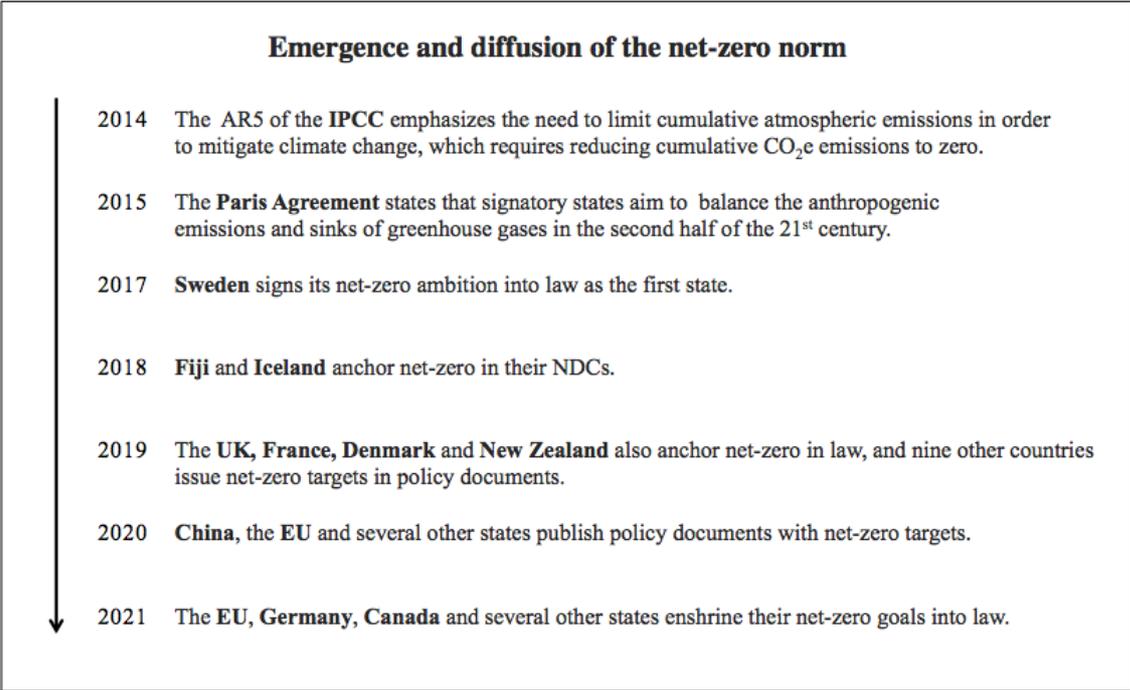
¹ What is the evolution of the net-zero norm and its meaning from its origins in science to its uptake in international climate governance?

² How do norm entrepreneur states interpret the net-zero norm?

³ How do norm entrepreneur states adapt the net-zero norm and implement it into practice?

made and secondary information on the form of institutionalization, referring to whether the net-zero target holds the status of a political pledge, is integrated in policy or even institutionalized in law (World Resources Institute, 2021). Based on the information in this database, three states that are early adopters have been identified as early norm takers: Sweden, China and Fiji. This is also observable in the overview of the emergence and spread of the net-zero norm globally (Figure 2).

Figure 2. Overview of the emergence and diffusion of the net-zero norm in global politics, based on Black et al. (2021) and World Resources Institute (2021).



Sweden is the first of the western and industrialized states, as well as the first state globally, to adopt the net-zero norm. China presents one of the first adopters among the large emerging economies and has great significance in addressing climate change as it emits the highest amount of GHGs globally in absolute terms (World Resources Institute, 2021). And Fiji constitutes the first adopter of Small Island Developing States (SIDS) that are most strongly impacted by the consequences of climate change. For each of these states, the documents listed in the Climate Watch Net Zero Tracker database that evidence the adoption of the net-zero norm were screened for analysis. Among these documents were speeches to the international community, national policy plans and long-term strategies submitted under the provisions of the Paris Agreement, NDCs and legislative documents implementing the norm into hard law. Moreover, desktop research on the policy implementation of the net-zero norm in these three states was performed in order to potentially locate additional policy documents or legislations not listed in the database.

To distill the contextual meaning of the net-zero norm in the engagement thereof by the three states, three text documents each were sampled for analysis (Table 1). The strategy for sampling followed the following steps: First, in case of legislative institutionalization of

the norm, the respective Climate Change Act was included in the analysis, which was the case for Sweden and Fiji but not China. Second, in case of integration into the long-term low emission development strategies that serve to communicate countries' long-term plans for reducing emissions, these documents were included in the analysis. This was the case for each of the three states. Third, the national policy plans underpinning and serving as the foundation for these long-term low emission development strategies were selected, which was again the case for each of the three states. Additionally, the transcript of the political speech given by China's president Xi Jinping during the Climate Ambition Summit in 2020 that first communicated China's net-zero ambition was included in the analysis.

Table 1. Overview of text documents serving as sources for analysis of the meaning of the net-zero norm in the respective state.

Norm taker	Text documents	Document type
Sweden	Swedish Climate Policy Framework (2017)	Policy framework (policy)
	Swedish Climate Act (2017)	Climate Change Act (law)
	Sweden's Long-Term Strategy for Reducing Greenhouse Gas Emissions (2020)	Policy strategy (policy)
China	President Xi Jinping's speech at the Climate Ambition Summit (2020)	Transcript (speech)
	China's Mid-Century Long-Term Low Greenhouse Gas Emission Development Strategy (2020)	Policy strategy (policy)
	Action Plan for Carbon Dioxide Peaking Before 2030 (2021)	Policy framework (policy)
Fiji	Fiji Low Emission Development Strategy 2018-2050 (2018)	Policy strategy (policy)
	National Climate Change Policy (2019)	Policy framework (policy)
	Climate Change Bill 2021 (2021)	Climate Change Act (law)

Additionally, a range of policymakers as well as experts on environmental and climate policy in the respective states were identified through desktop search. Invitations for interviews were sent out, however, the response rate was very low with most of the respondents declining the invitation. One semi-structured interview was conducted with Prof. Katarina Eckerberg on January 17, 2022. With a background in political sciences, she is an academic expert on Swedish and European environmental policy affiliated with Umea University, Sweden. She was also appointed to the Swedish Climate Policy Council and served from 2017 until 2021. The list of questions asked during the interview was based on the theory of norm localization and can be found in Appendix B. The interview was video recorded and automatically transcribed using the conferencing software MS Teams.

3.3 Data analysis

The analysis of the collected data followed the qualitative research method of discourse analysis laid out above using the tool of qualitative coding. In the process of coding, textual data is transformed into meaningful categories or concepts to identify themes and patterns within language in an iterative process spanning multiple rounds of coding and recoding (Hsieh & Shannon, 2005; Schmidt, 2004). Based on the explorative character and the larger research goals of this thesis, the analysis followed an inductive coding approach. This means that analytical categories were derived from the material, and subsequently (re-) applied to the data (Hsieh & Shannon, 2005; Schmidt, 2004). Although this approach is not directed (Hsieh & Shannon, 2005) as it does not apply pre-established and theory-dependent codes, detailed knowledge on context and theory of the researcher are important for guiding the inductive coding (Schmidt, 2004).

Analytical codes were first derived from the documents demonstrating the norm engagement of each state in order to ensure openness to the data. In a second step, codes were grouped into categories and evaluated in an iterative process. To enable comparison between the analysis of the localization of the net-zero norm, meaning interpretation and implementation, the codes and code groups were formalized for one norm taker state, namely China (this coding structure is found in Appendix C). Subsequently, these codes and code groups were applied to the data of Swedish and Fijian text documents. In this way, the quantity of information was reduced for extracting relevant aspects of comparison while still incorporating unique features of the three states essential to the discourse analysis (Schmidt, 2004).

For instance, to gain understanding of the interpretation of the net-zero norm by the norm taker states, a series of codes subsumed under the group of net-zero operationalization was created. While analyzing the documents, it became apparent that different aspects characterize how the norm takers interpret the net-zero norm. For example, these different aspects relate to the terminology used to define the norm, and the range of emissions covered by the norm. Therefore, the codes of ‘terminology’ and ‘emissions coverage’ were created, and applied to all documents. This allowed for comparing the different norm localizations. For instance, whereas in Swedish documents the norm is termed ‘net zero emissions of GHGs’, the norm is referred to as ‘carbon neutrality’ in Chinese documents. Similarly, additional codes in the group of the net-zero operationalization included the ‘timeframe’ and ‘interim targets’.

The qualitative coding of both text documents and transcribed interviews was performed using the coding software ATLAS.ti version 9.1.3 (ATLAS.ti Scientific Software Development GmbH, 2022). Each coding group was also associated with a specific color to facilitate orientation in the dynamic process of coding.

4. The life cycle of the net-zero norm: from emergence in science to uptake in climate governance

This section analyses the early stages of the life cycle of the net-zero norm and identifies the norm entrepreneur essential for the emergence of the norm and subsequent dynamics of norm diffusion. Based on a constructivist theoretical perspective, the analysis draws on the theory of the norm life cycle as developed by Finnemore & Sikkink (1998). By applying this theory, this thesis aims to provide insights into the origins of the norm and the dynamics of its diffusion that led to its mainstream uptake in the political arena. This also includes the aim of tracing the evolving meaning of the norm in this process. The norm life cycle is described as a three-stage process that starts with the emergence of a new norm due to the advocacy activities of norm entrepreneurs. It then transitions into a norm cascade when a critical mass of states has adopted the norm. Lastly, it leads to norm internalization when the new norm is integrated into the existing normative structure and is therefore not contested anymore (Finnemore & Sikkink, 1998). Understanding the life cycle of the net-zero norm and its meaning evolution thus requires distinguishing these three phases. After setting the scene prior to the net-zero norm, this chapter investigates the first stage of norm emergence and the second stage leading to norm diffusion in form of a norm cascade.

4.1 Normative context prior to the emergence of the net-zero norm

The recent wave of net-zero ambitions by states is in contrast to the normative structure of the climate regime in the Kyoto era of climate politics. The rules and agreements set out in the Kyoto Protocol are reflective of the broader normative context, which resulted in low ambition by states to take ambitious action and commit to large emission reduction targets. The Kyoto Protocol presents the first agreement at the international level that addresses climate change and can be argued to present a success in that regard. However, scholars judge the Kyoto Protocol as largely unsuccessful (Keohane & Oppenheimer, 2016; Oberthür, 2016) in terms of effective outcomes: the agreement covers only developed countries and mandates very low emission reduction obligations, on average reductions of 5% compared to 1990 levels (UNFCCC, 1998).

As an underlying reason explaining the unsuccessful outcomes, Keohane & Oppenheimer (2016) mention the decentralized nature of world politics and the absence of a world government that can mandate and enforce rules to mitigate climate change. This notion relates to the conceptualization of climate change as a Prisoner's Dilemma. In simplified terms, states face strategic incentives to free-ride the emission reduction efforts by other states. They do not have incentives to pursue the cooperative but more costly strategy of reducing emissions themselves. This results in a collective action problem where states might strategically pursue emissions reduction necessary for invoking reciprocity in other states, but have no incentives to undertake meaningful action individually (Barrett, 2016; Battersby,

2017; Carattini et al., 2019). The small impact on emissions achieved by the Kyoto Protocol, which several states withdrew from after the US stepped out of the agreement (Cléménçon, 2016), demonstrated the inability of the international community to create an effective treaty. Together with the failure of the Conference of the Parties 15 (COP15) to achieve a more ambitious agreement on climate change (Oberthür, 2016), this seemed to confirm these pessimistic perspectives on international cooperation on climate change.

This failure to reach a renewed and ambitious agreement in Copenhagen in 2009 was due to several factors that coincided with one another. The ‘climagate’ scandal, which resulted from the leakage of emails suggesting the manipulation of climate data, called into question the integrity and credibility of climate science and its evidence for anthropogenic climate change in the eyes of the public (Christensen & Wormbs, 2017). More important to the negotiations at COP15, however, were competing perspectives on what constitutes effective climate action and divides over fairness and equity that surfaced between developed and developing countries (Christoff, 2010). Points of contention related to whether the agreement should include legally binding emission reduction obligations or not, and whether these obligations would also apply to the developing non-Annex I countries. Relating to that, disputes surrounded the question of how high the emission reductions by the developed Annex I countries should be exactly. Different positions also existed with regards to the long-term temperature goal of 2°C or 1.5°C global warming, and the specifics of funding for adaptation from the Global North to the Global South (Christoff, 2010). These divides, which led to the failure of achieving a more ambitious climate agreement than the Kyoto Protocol, demonstrate the highly contested normative context in which climate negotiations took place and that contributed to the unsuccessful outcome.

4.2 Emergence of the net-zero norm in science

The net-zero norm emerged in this highly contested normative space characterizing the Kyoto era. But instead of calling into attention a new issue, the net-zero norm presents new ways of framing and understanding (Finnemore & Sikkink, 1998) the already salient and hotly debated problem of climate change. The norm first emerged as a result of scientific modeling of future emission development and corresponding temperature responses in the climate system. It was brought to attention in the international political arena through the presentation in the IPCC’s Fifth Assessment Report (AR5) and its Summary for Policymakers in 2014. Arising from this, the IPCC consequently functioned as the norm entrepreneur due to its efforts of persuading the international community to find global solutions to climate change. The IPCC itself presents a hybrid organization between science and policy (Livingston & Rummukainen, 2020). It is tasked with synthesizing the state of the art of climate science on the causes and consequences of climate change, and communicating its findings to policymakers. Although the IPCC based on that exists in both the scientific and political realms, its mandate is to be policy-relevant but never policy prescriptive (Livingston & Rummukainen, 2020; Turnhout et al., 2016).

How does the net-zero norm differ in its problem framing from previous issue framings of climate change, and thereby contribute to new understandings of the climate change problem? With the Summary for Policymakers of the AR5, the IPCC explicitly emphasizes the scientific concept of cumulative atmospheric emissions to policymakers as critical for understanding and addressing the issue of climate change. This concept communicates that solutions to mitigate climate change build on a limited and finite atmospheric carbon budget, which cannot be exceeded if global warming should be limited to 1.5-2°C by the end of the century. Prior to this, political discussions in the Kyoto era of climate politics focused on partial reductions of the emissions of developed countries as solutions for climate change. Dominant conceptualizations revolved around discussions of emission rates and relative emission reductions that some states should undertake. Although this approach recognizes the need to reduce emissions, climate change mitigation is not conceptualized in terms of finite amounts of GHGs that can be stored by the atmosphere without resulting in what is termed ‘dangerous climate change’. Without this element of scarcity referring to the atmospheric carbon budget, the climate regime has produced agreements that addressed climate change by reducing some but not all emissions. This coincided with low ambition to address the issue in the Kyoto era (Keohane & Oppenheimer, 2016; Oberthür, 2016).

The net-zero norm does not allow for issue conceptualizations that view partial emission reductions by a group of states as sufficient. Instead, the IPCC presents constrained cumulative GHG emissions as a requirement for the goal of mitigating the worst impacts of anthropogenic climate change and limiting global warming to a maximum of 2°C (Black et al., 2021). The target of limiting climate change to 2°C is based on the conceptualization of dangerous climate in terms of global mean temperature change under Article 2 of the United Nations Framework Convention on Climate Change (UNFCCC) (Lenton, 2011). On the basis of quantitative modeling, the IPCC demonstrates that this political goal of limiting climate change to a maximum of 2°C global warming requires bringing global absolute emissions down to net zero. In the corresponding Summary for Policymakers corresponding, the IPCC communicates this concept of net-zero emissions to politicians and decision-makers (IPCC, 2014, pp. 19-20).

Substantial cuts in GHG emissions over the next few decades can substantially reduce risks of climate change by limiting warming in the second half of the 21st century and beyond. Cumulative emissions of CO₂ largely determine global mean surface warming by the late 21st century and beyond. Limiting risks across RFCs [Reasons For Concern] would imply a limit for cumulative emissions of CO₂. Such a limit would require that global net emissions of CO₂ eventually decrease to zero and would constrain annual emissions over the next few decades [...]. Emissions scenarios leading to CO₂-equivalent concentrations in 2100 of about 450ppm or lower are likely to maintain warming below 2°C over the 21st century relative to pre-industrial levels. These scenarios are

characterized by 40 to 70% global anthropogenic GHG emissions reductions by 2050 compared to 2010, and emissions levels near zero or below in 2100.

Through this, the IPCC advocates for the net-zero norm and grounds the reach of this norm at the international level. Arising from its mandate of serving the international climate regime (Turnhout et al., 2016), the IPCC defines the net-zero norm at a global level. This means that global emissions should be reduced to net-zero for limiting climate change to 2°C of mean global warming. Next to this, the definition is also informed by the general foundation of the IPCC's assessments in the natural sciences that focus on quantitatively modeling emission developments and resulting temperature changes (Minx et al., 2017). In addition to the mandate of serving the global climate regime, these modeling approaches are also primarily located at the global level. This is due to the global nature of the climate system with GHGs mixing in the atmosphere and thereby being distributed rather evenly across the globe (Lenton, 2011). Consequently, the determination of the climate system response is abstracted to a modeling exercise that takes interest in the impacts of the sum of total emissions to the atmosphere (Interviewee, personal communication, December 16, 2021).

However, this approach also bears the danger of simplifying the issue of climate change to some aggregated global numbers that convey the idea that anthropogenic adjusting of the climate system would be possible. One prominent example of this is the creation of realities through the integrated assessment models used by the IPCC, which included still speculative negative emission technologies in their modeling to achieve net-zero emission (Interviewee, personal communication, December 16, 2021). Moreover, although the IPCC aims to refrain from being policy prescriptive by presenting the net-zero norm at the abstract global level, the net-zero norm is still inherently political (Interviewee, personal communication, December 16, 2021). This is because the definition at the global level opens up questions in the course of the implementation by nation-states. As achieving net-zero emissions requires global cooperation, the need of negotiating the burden-sharing is makes it political. Differences between states exist with regards to historical responsibility, negative or positive impacts of climate change and the vulnerability to those, as well as capacities of reducing emissions and adapting to a changing climate. This implies that the global net-zero cannot directly be translated into national net-zero, but that this is a topic of political negotiation.

The shift in how the IPCC conceptualized the problem of climate change is also reflected in a shift in climate governance itself, demonstrating the impact of the IPCC as a norm entrepreneur. The climate regime in the Kyoto era was characterized by divides over which states should reduce their emissions by how much (Keohane & Oppenheimer, 2016). This shed a dire outlook on effective cooperation to mitigate climate change. The era of the Paris Agreement, however, aligns more with the most recent IPCC report. Based on the evolved scientific conceptualization in the AR5, the Paris Agreement presents climate change mitigation not as a question of relative emission reductions, but a question of limiting cumulative atmospheric emissions globally. In other words, through changing the issue

framing of climate change and related solution strategies, the IPCC created and advocated for the new net-zero norm for mitigating climate change that was subsequently taken up at the international political level.

4.3 Uptake of the net-zero norm in international climate governance

After the IPCC advocated for the net-zero norm in its Summary for Policymakers (IPCC, 2014), the norm quickly became a central principle in the climate regime. It also marks an important distinction between the nature of the targets set under the Paris Agreement in comparison to the Kyoto Protocol. Whereas the Kyoto Protocol establishes certain emission reduction targets for developed states, the Paris Agreement departs from this top-down approach of mandatory targets for individual (groups of) countries. Rather, it relies on nationally determined contributions (NDCs) in order to achieve the global temperature goal that states agreed to under Article 2a (UNFCCC, 2015, p. 3) of

Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels [...].

One of the key differences between the Paris Agreement and the Kyoto Protocol thus relates to the nature of the goal, which evolved from rather low emission reduction targets for a group of states under the to a global mean temperature goal. On the one hand, this demonstrates the raised importance assigned to climate change mitigation in the international political arena. On the other hand, this also demonstrates a shift in the notion of responsibility to mitigate climate change: responsibility for addressing climate change is now distributed globally. Developing countries are expected to contribute under the Common But Differentiated Responsibilities (CBDR) principle. Developed countries are not only responsible for reducing their own emissions as a goal in itself but to help achieve the global goal of net-zero emissions. This is expressed in Article 4.1 through which signatory parties intend to achieve this long-term temperature goal set out in Article 2a (UNFCCC, 2015). By reaching peak emissions and subsequently driving down absolute global emissions to net-zero, which is referred to as a balance of sources and sinks, the signatory parties to the Paris Agreement (UNFCCC, 2015, p. 4) state that

In order to achieve the long-term temperature goal set out in Article 2, Parties aim to reach global peaking of greenhouse gas emissions as soon as possible, recognizing that peaking will take longer for developing country Parties, and to undertake rapid reductions thereafter in accordance with best available science, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century [...].

In this definition of the norm, the Paris Agreement, being the central institution for climate governance, sets out the goal of reaching net-zero emissions as the primary objective for achieving its long-term temperature goal. At this international level, the definition put forward by the IPCC is adopted in large parts, with one distinction: whereas the IPCC sets the timeframe to 2100, the Paris Agreement uses the rather vague wording of achieving net-zero emissions in the second half of the century, while explicitly recognizing the differential capabilities of developed and developing countries. Besides that, the Paris Agreement explicitly frames net-zero emission in terms of balancing sources and sinks of emissions. This follows the quantitative emissions accounting that provides the foundation of the climate modeling sciences, which already surfaced in the IPCC's creation of the norm. On the political dimension, this opens up the challenges of establishing arrangements for emission accounting of sources and sinks.

After the uptake of the norm in the Paris Agreement, it took less than two years until the first state implemented the net-zero norm also at the national level. After that, a norm cascade (Finnemore & Sikkink, 1998) followed with at the time of writing 83 states having adopted net-zero targets (World Resources Institute, 2021). Although this might seem like the life cycle of the net-zero norm has reached the last stage of norm internalization already, ongoing contestation over the meaning of the norm is indicated by differences in institutionalization and ongoing processes thereof (World Resources Institute, 2021). Rather than wholesale adoption of the net-zero norm as theorized in the linear model of the life cycle theory, this indicates more complex dynamics of norm diffusion. The following chapter will investigate these processes of norm diffusion in more detail for the three states Sweden, China and Fiji.

5. The life cycle of the net-zero norm: cascading uptake by norm leader states

This section analyses the uptake of the net-zero norm by so-called norm leader (Finnemore & Sikkink, 1998) or norm taker (Acharya, 2004) states by investigating how these states a) interpret and b) implement the net-zero norm. The theory of norm localization developed by Acharya (2004) informs the analysis of how this international norm transcends from the global to the local level. The theory is applied by analyzing both the normative fit with the preexisting normative structure, as well as the process of congruence building through framing and grafting (Acharya, 2004). Using this theory of localization enables insights into the potential variations in norm interpretation and implementation arising from domestic filters in the process of adopting the international net-zero norm.

5.1 The net-zero norm in Sweden

Sweden implemented the net-zero norm into national policy as the first country globally by establishing the Swedish Climate Policy Framework in 2017, which reinforces the image of Sweden as a general frontrunner in environmental and climate policy (Matti et al., 2021) and its engagement with global norms (Ingebritsen, 2002). The target of achieving net-zero emissions is established through the Swedish Climate Policy Framework, which is the central policy putting the ambitions of the Paris Agreement into practice. The Swedish Climate Policy Framework sets out the target of achieving net-zero GHG emissions by 2045, which is to be followed with net negative GHG emissions thereafter without a specific timeframe determined for this (Swedish Climate Policy Framework, 2017). It consists of three elements: 1) the long-term Climate Goals of net-zero emissions of GHGs in 2045 and net-negative emissions thereafter, 2) the Swedish Climate Act that establishes a procedural system with reporting requirements for the government to the parliament about progress made towards the Climate Goals as well as the obligation to devise Climate Policy Action Plans every four years and 3) the Swedish Climate Policy Council, which is an independent expert body to evaluate the government's climate policy (Swedish Climate Policy Framework, 2017).

The Swedish Climate Act follows the hard law character of Climate Change Acts that constitute the legislative framework establishing general principles and obligations for national climate policy making (Karlsson, 2021). However, the act itself does not specify Sweden's climate targets, but merely the procedural rules of climate policy making (Matti et al., 2021). This distinction between the legislative nature of climate targets and policy procedures surrounding the net-zero norm in Sweden is in contrast with characterizations by third parties. For example, the Climate Watch Net-Zero Tracker, which portrays the net-zero norm to be implemented into Swedish national law (World Resources Institute, 2021). Based on the Climate Act and the provisions laid out in the Climate Policy Framework, the Swedish Climate Policy Action Plan (2019) was presented. It presents the foundation for the

implementation through Sweden's Long-Term Strategy for Reducing Greenhouse Gas Emissions (hereafter referred to as Long-Term Strategy) (2020).

5.1.1 Interpretation of the net-zero norm

Sweden's interpretation of the global net-zero norm for domestic uptake is demonstrated in its formal operationalization of terminology and definition, the scope of climate change driving emissions covered by the definition, as well as the time frame including interim targets (Table 2). First, Sweden adopts the terminology of the global net-zero norm that set out the goal of net-zero emissions. Sweden defines this to mean achieving net-zero emissions by 2045 through emission reductions of at least 85% compared to 1990 levels in the national context (Swedish Climate Policy Framework, 2017). Although the Swedish policy documents refer to the Paris Agreement and frame the net-zero ambition as contributing to its temperature goals, they do not establish linkages to the definition of net-zero emissions as stated in the Paris Agreement. Rather, the net-zero norm is framed as a national Swedish goal in order to contribute to the temperature goal of limiting global warming to 2°C and preferably 1.5°C. Consequently, the framing of net-zero emissions as “a balance between anthropogenic GHGs emission and removals by sinks in the second half of this century” (UNFCCC, 2015, p. 4) is not used in the Swedish context. Instead, the Swedish policy documents refer to the net-zero norm in relation to Article 4, which states that

Long term strategies shall contribute to fulfilling Parties commitments under the UNFCCC and the Paris Agreement to reduce anthropogenic greenhouse gas emissions and enhance removals by sinks, and to promote increased carbon sequestration.

Second, Sweden determines the scope of emissions subject to the net-zero norm to extend to GHG emissions within the territorial scope of Sweden's national borders. It explicitly excludes the emissions from international aviation and maritime transport. However, the terminology of GHG emissions is used to define Sweden's net-zero ambition without naming the specific GHGs subject to this definition in neither of the policy documents analyzed. Most of the measures stated in Sweden's Long-Term Strategy refer to GHG emissions in general, with some measures such as the carbon tax explicitly limiting its scope of application to carbon dioxide (CO₂) emissions. Sweden's Long-Term Strategy also states the objective to reduce methane (CH₄) and nitrous oxide (N₂O) emissions in the agricultural and waste sectors, and to cut emissions of fluorinated gases (f-gases) in the industry. But the definition of the net-zero emissions target does not explicitly include these emissions in its scope.

Third, Sweden sets the time frame for achieving net-zero emissions of GHGs to 2045, after which Sweden strives for net negative emissions without further specifying timeframes for this. This interpretation presents a shorter time frame than the ones stated by the IPCC or

the Paris Agreement in Article 4.1 of achieving “a balance between anthropogenic GHGs emission and removals by sinks in the second half of this century” (UNFCCC, 2015, p. 4).

Fourth, Sweden sets quantitative interim targets for 2030 and 2040 in order to reach the long-term objective of net-zero emissions by 2045. On the one hand, these interim targets apply to overall emissions, and on the other hand, there are also sector-specific interim targets in place. Interim targets include overall national ERs of at least 55% by 2030 and at least 73% by 2040 compared to the baseline of 1990 emission levels. CDR and offsetting measures are limited to a maximum contribution to these targets of 8% and 2%, respectively (Swedish Climate Policy Framework, 2017). Sector-specific interim targets concern the transport sector, where the target is to reduce emissions from domestic transport excluding aviation by at least 70% compared to the 2010 baseline.

Table 2. Sweden’s interpretation of the net-zero norm, based on the Swedish Climate Policy Framework, Swedish Climate Act and Sweden’s Long-Term Strategy for Reducing Greenhouse Gas Emissions.

Sweden’s interpretation of the net-zero emissions norm	
Terminology	<ul style="list-style-type: none"> • Net-zero emissions that include a reduction of emissions by at least 85% compared to 1990 • Net-negative emissions after 2045
Emissions covered	<ul style="list-style-type: none"> • GHGs • Territorial emissions caused within the national borders, with the emissions in international trade and international shipping not accounted for
Timeframe	Net-zero by 2045, net-negative thereafter
Interim targets	<ul style="list-style-type: none"> • By 2030, reduce emissions from domestic transport (excluding domestic aviation) by a minimum of 70% compared to 2010. • By 2030, reduce emissions covered by the EU Effort Sharing Regulation by a minimum of 63% compared to 1990 and increase this reduction to a minimum of 75% by 2040. A maximum of 8% and 2% may be achieved through supplementary measures, respectively.

A critical evaluation of Sweden’s interpretation of the net-zero norm concerns the definition covering GHG emissions in general without establishing quantitative targets for each emission category, and the differentiation between ER versus CDR and offset targets. First, in the Swedish interpretation of the net-zero norm, the scope of emissions covered refers to GHGs in general. This broad category of emissions covered does justice to the complexity of the climate change problem, which is to a large part but not exclusively caused by anthropogenic CO₂ emissions. But neither of the policy documents analyzed actually determines which GHGs the net-zero target applies to. In reporting on the progress in reducing Sweden’s total emissions, the Long-Term Strategy does distinguish between carbon

dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and fluorinated GHGs (HFCs, PFCs and SF₆). However, it does not explicitly state that all these emissions are within the scope of Sweden's net-zero target. The separation of planned emission reductions covered under the European Union Emissions Trading Scheme (EU ETS) and those covered under the Effort Sharing Regulation (ESR) could present another indicator. The Long-Term Strategy implies that emissions of CO₂, N₂O and perfluorocarbons (covered in EU ETS) and fluorinated GHGs (covered in ESR) are subject to the net-zero norm. Nonetheless, this does not explicitly include CH₄ emissions, even though the Long-Term Strategy references policy measures to reduce CH₄ emissions from agriculture and waste. In addition to this ambiguity in the scope of emissions covered by the norm, quantitative targets for emission categories are lacking, which would enhance the transparency of Sweden's interpretation of the norm.

Second, the Swedish Climate Policy Framework differentiates between targets for ER versus targets for CDR and offsets that are counting towards the achievement of the net-zero goal as well as interim targets. With this clear distinction, the Swedish interpretation of the net-zero norm provides increased transparency and clarity on the relative contributions of reductions and removals compared to the majority of states, companies and organizations (Rogelj et al., 2021). Moreover, by establishing that CDR and offset measures can only contribute a maximum of 15% to the achievement of net-zero emissions in 2045, Sweden reframes the “balance between anthropogenic GHGs emission and removals by sinks” (UNFCCC, 2015, p. 4) into a weighted balance favoring emission reductions. As the relative contributions of CDR and offsets are limited to rather low proportions, Sweden will have to achieve the major share through large-scale ER.

5.1.2 Implementation of the net-zero norm

Sweden implements the net-zero norm in the short term through Climate Policy Action Plans that the government is obliged to draw up every four years, based on the Swedish Climate Policy Framework (Swedish Climate Policy Framework, 2017). The first Climate Policy Action Plan was established in 2019 and provides the basis for Sweden's Long-Term Strategy, which was released in 2020. Through the Climate Act established as part of the Climate Policy Framework, the government is obliged to draft climate policy that is consistent with the Climate Goals, including the interim goals and the net-zero emissions goal for 2045. Thus, the Long-Term Strategy is the central climate policy document for achieving the long-term goal of net-zero emissions, as it also establishes the medium-term goals for emissions reductions in 2030 and 2040, which are to reduce emissions by 63% and 75%, respectively. The analysis of the selected policy documents shows that the Swedish policy mix to implement the net-zero norm uses the following instruments, listed from most to least used policy types: economic policies using market-based instruments, regulative policies using restrictive bans or standards, policies promoting certain objectives through financial support, and communicative policies focusing on information provision and networking.

Economic instruments present the majority of policy measures in the Climate Policy Action Plan and in the Long-Term Strategy to achieve net-zero emissions. Sweden's

economic instruments provide both positive and negative incentives for societal actors to reduce GHG emissions and rely on pricing instruments to achieve cost-effective climate policy. The Long-Term Strategy states that “[e]missions pricing forms the basis of governance” (Long-Term Strategy, 2020, p. 5). This is implemented in the form of emissions taxes in various sectors including electricity, energy, fuels, air travel transport for commercial flights departing from Sweden and industrial emissions as well as waste and landfill. Specifically, taxes exist for sulfur emissions, nitrogen monoxide emissions and for electricity, but the “most important taxes that affect greenhouse gas emissions in Sweden are the carbon tax and the energy tax on [diesel and petrol] fuels” (Long-Term Strategy p. 37). In addition to nation-wide taxes that target all economic actors, more flexible economic instruments such as a certificate market for electricity are established as well. The Swedish Electricity Certificate System “seeks to increase the proportion of renewable electricity production” (Long-Term Strategy, 2020, p. 59) through issuing electricity certificates that can be traded in a market. Electricity producers must buy electricity certificates equal to a specific quota of their produced electricity that is determined by the government, but are allocated free certificates for each megawatt hour of renewable electricity produced. This provides incentives for those producers to generate more electricity from renewables who can do so at lower marginal costs than the price of certificates in the market. The Swedish Electricity Certificate System thus functions according to the market logic of maximizing cost-effectiveness, which is a required “starting point when introducing policy instruments in Sweden” (Long-Term Strategy, 2020, p. 36). The Long-Term Strategy explains that “[c]ost-efficiency means that instruments should be general and not promote a particular solution, and that they should give all actors the same incentives to reduce their environmental footprint” (Long-Term Strategy, 2020, p. 36).

Besides these macro-economic instruments, Sweden implements a mix of positive (rewarding) and negative (punitive) economic incentives on the micro scale to complement overarching pricing mechanisms and to steer behavior. Positive economic incentives include an “eco-bonus system to stimulate switching goods traffic from road to sea transport” (Long-Term Strategy, 2020, p. 49), a “[t]ax reduction [...] to stimulate investment in microproduction of renewable electricity” (Long-Term Strategy, 2020, p. 60) and a climate premium available for transport authorities for the introduction of “electric buses, trolleybuses and fuel cell buses for public transport” (Long-Term Strategy, 2020, p. 51). In the area of individual transportation, a combination of positive and negative economic incentives works in the form of a bonus-malus system to steer the purchase of low emission cars. In this bonus-malus system, “vehicles with low carbon dioxide emissions can qualify for a bonus on purchase, while vehicles with high carbon dioxide emissions in their first three years have a higher vehicle tax” (Long-Term Strategy, 2020, p. 50). Both the taxes and the bonus and bonus-malus system demonstrate that Swedish climate policy relies heavily on the market logics of economic instruments. To summarize, the “price signal, i.e. the economic driver, is an important incentive for behaviours and investments” (Long-Term Strategy, 2020, p. 29) in the Swedish interpretation of the net-zero norm.

Regulative as well as promoting policy instruments complement the main governance mechanism of emissions pricing. The regulative instruments rarely take the form of outright bans and rather focus on setting standards, with the only direct ban being placed on combustible and organic waste in landfill to regulate CH₄ emissions. Rules and principles for waste, land drainage and land and forest management are established in Sweden's Environmental Code, which has the "overarching goal to promote sustainable development" (Long-Term Strategy, 2020, p. 41). Sweden's regulative instruments further aim to steer consumption behavior through information provision. For example, the Energy Labelling Regulation "makes the product's energy consumption visible, making it easier for consumers to make energy-smart choices" (Long-Term Strategy, 2020, p. 63). Standards like the Ecodesign Directive regulate energy-related products as through establishing "requirements [that] act as a floor for banning and removing the most energy intense products on the market" (Long-Term Strategy, 2020, p. 63). Thereby, such standards "intend to improve the environmental performance of products throughout their life cycle (Long-Term Strategy, 2020, p. 63). Additional standards apply to the building and construction sector, the sales of cars and public procurement.

Next to these direct bans and standards, the regulative instruments also include two obligations, which target the transport sector both at the end of fossil fuels and at the end of renewables at the same time. On the one hand, the Long-Term Strategy establishes an emission reduction obligation for petrol and diesel fuels, aiming to encourage the use of biofuels. The Emission Reduction Obligation states that "all fuel suppliers must reduce greenhouse gas emissions from petrol and diesel by a certain percentage each year [...] [which] makes an important contribution to phasing out fossil fuels in the transport system" (Long-Term Strategy, 2020, p. 49). On the other hand, the Long-Term Strategy also sets out the Act on the Obligation to Supply Renewable Fuels. This obligation declares that in order to increase the availability of renewable fuels, "filling station with sales of more than 1,5000 m³ of petrol or diesel must offer at least one renewable fuel" (Long-Term Strategy, 2020, p. 51). Thus, these two regulations work together to reduce the share of fossil fuels in the transportation sector and at the same time encourage the use of biofuels instead. Overall, Sweden's regulative instruments set baseline standards and principles that act as a floor for regulating emission intense activities. However, the major incentives to steer society remain economic instruments.

In the domain of promoting policies, Sweden establishes out several measures that allocate financial support from the government in the form of grants, subsidies and funding. As these policy measures do not set concrete and quantitative targets they aim to achieve, they have the function of stimulating improvements in energy efficiency and reductions of GHG emissions. Therefore, they are complementary to command-and-control as well as economic incentive-based instruments. Examples from the Long-Term Strategy are the "Energisteget" (Long-Term Strategy, 2020, p. 5) energy efficiency grants for industry and the "Klimatklivet" (Long-Term Strategy, 2020, p. 39) local climate investment grants for organizations that can cost-effectively reduce emissions. Additional financial support is provided through "urban

environment agreements” (Long-Term Strategy, 2020, p. 47) for investment in public transport and sustainable goods transport, as well as funding for municipalities “to make it easier to build wind farms” (Long-Term Strategy, 2020, p. 60). The financial assistance provided by the government to promote increasing efficiencies and emission reductions remains overall small compared to the pricing signal of economic instruments. This demonstrates that the government relies on steering functions but leaves implementation responsibility largely to society and industry.

Sweden also employs communicative policies that use informative and educational instruments and mainly have the function of facilitating information exchange between industry actors. The energy efficiency networks are “regional networks of companies where SMEs [Small and Medium Enterprises] gain help and support in their work to cut energy consumption” (Long-Term Strategy, 2020, p. 55). These networks aim to facilitate the exchange of lessons learnt and best practices and thereby contribute to peer-to-peer learning. Additionally, the Long-Term Strategy establishes information centers for sustainable construction, as well as training and capacity building measures in the area of low-energy buildings for actors in the construction industry. Besides this, Sweden aims “to facilitate a dialogue between the industry and government agencies on appropriate guiding objectives and measures in each sector to cost-effectively contribute to the target of 50 per cent more efficient energy consumption in 2030” (Long-Term Strategy, 2020, p. 29). A broad societal dialogue with actors from industry, municipalities, the public sector and civil society also has the strategic function of creating “roadmaps to eradicate obstacles and facilitate more rapid reductions in emissions [...] for a competitive climate transition” (Long-Term Strategy, 2020, p. 38). These communicative policies demonstrate that Sweden’s implementation of the net-zero norm is not merely put in practice in a top-down manner, but aims to connect and integrate societal actors as well.

5.1.3 Influential norms and ideas in the localization of the net-zero norm

Norms and ideas that influence the local adaptation of the global net-zero norm shape both interpretation and implementation and highlight Sweden’s ambitions to set high standards both internationally and nationally and to promote the notion of sustainable growth and profit. Being the first state to adopt the net-zero norm and implement it through ambitious and transparent targets, while also creating an independent body tasked with the evaluation of the government’s policy positions Sweden as a global leader on climate change mitigation. Setting these high ambitions also provides a long-term vision nationally and thereby steers industrial innovation for emission reduction and increased efficiency, thus following economic self-interest and contributing to sustainable growth. Moreover, Sweden advocates for the idea of sustainable growth and profit by focusing on forest resources, both for climate change mitigation through the function of forests as carbon sinks and for the switch to a bioeconomy based on biofuels.

First, Sweden uses its ambitious and transparent interpretation of the net-zero norm to demonstrate leadership in the international climate regime. In its policy documents, Sweden

showcases its “great international climate leadership [...] [through] emission reductions that far exceed Sweden’s required emission reductions” (Swedish Climate Policy Framework, 2017, p. 4). The documents also emphasize that “Sweden is one of the countries in the world that has the capacity to lead the way and show that a fossil-free society is possible” (Long-Term Strategy, 2020, p. 8). Through its implementation of the net-zero norm into national policy as the first state globally, Sweden verifies these claims of leadership, when looking at the scale of adoption versus resistance. It also further substantiates these claims by complementing this symbolic adoption with rather strict goals that limit the contribution of CDR and offset measures to small proportions of the ER goals on the one hand, and by the establishment of an independent body to assess and scrutinize the government’s climate policy on the other hand. Through this, Sweden operationalizes the global net-zero norm through concrete and ambitious implementation, which acts to influence the global reception of the norm. Thereby, Sweden continues to pursue the leadership position in setting international norms and shaping global concepts that it has assumed in global environmental and developmental politics, given that “Sweden always wanted to be a leader in development [and environment] policy” (K. Eckerberg, personal communication, January 17, 2022).

However, next to concerns for global issues of sustainable development, national factors are also important. These interact with Sweden’s strict and ambitious interpretation of the net-zero norm and its ambition for leadership in the international climate regime. In the area of environmental policy, Sweden showcases a legacy of setting ambitious policy goals nurturing this leadership idea. That idea is based on the “self-conceptualization that it would be quite easy [for Sweden to achieve its goals] because a lot of things were already in place [...] [and that Sweden was] already halfway there” (K. Eckerberg, personal communication, January 17, 2022). Given the historic successes with reducing energy consumption and related emissions since the oil crisis, the ambitious goal of reducing national emissions to net-zero seemed possible, especially with the large assets of renewable energy in Sweden (K. Eckerberg, personal communication, January 17, 2022).

And in addition to these ultimately cosmopolitan motivations of mitigating global climate change, economic self-interest also plays a role in Sweden’s leadership in adopting the net-zero norm. Swedish “industry has realized more than 20 years ago that saving energy and being environmentally friendly is paying off and is actually profitable” (K. Eckerberg, personal communication, January 17, 2022) due to increased competitiveness. This has spurred technological innovation in the Swedish industry with the Swedish businesses and industries being leading internationally on technologies for halting climate change. Therefore, interpreting the net-zero norm ambitiously with clear and high emission reduction targets provides a long-term vision for actors to innovate. This serves economic interests as “Sweden also thought that its industry could benefit because [...] [it] could sell technologies where [...] [it is] ahead of others” (K. Eckerberg, personal communication, January 17, 2022). Such economic self-interest closely relates to the norms of cost-effectiveness and pricing mechanisms for spurring innovation, which are evident in the policy documents and form the basis of Sweden’s climate governance (Long-Term Strategy, 2020). This approach also

demonstrates that in the Swedish localization of the global net-zero norm, the state has a central role in steering society. The responsibility for implementation is, however, being broadly distributed (K. Eckerberg, personal communication, January 17, 2022) with little direct and prescriptive regulation but market-based instruments that allow for flexibility (Long-Term Strategy, 2020).

Second, through its interpretation of the net-zero norm to be achieved only through minor contributions of CDR and offsets, Sweden pursues the idea of a sustainable two-fold use of its forest resources for both climate change mitigation and economic development. Aiming simultaneously for an “active forestry with high environmental requirements as well as maintaining a significant carbon sink” (Long-Term Strategy, 2020, p. 76) demonstrates this idea of increasing the economic benefit of Sweden’s vast forest resources. These forests are termed Sweden’s “green gold” (Long-Term Strategy, 2020, p. 78) and cover around two thirds of its area (K. Eckerberg, personal communication, January 17, 2022). On the one hand, this two-fold use is made possible as CDR, including forests as natural sinks next to offsets, are restricted to contribute a maximum of 15% to the long-term goal of net-zero emissions in 2045. As these proportions of CDR and offsets have symbolic value rather than being based on scientific assessment (K. Eckerberg, personal communication, January 17, 2022), they act to promote the goal of the two-fold use rather than to follow scientific standards. On the other hand, although the objective of “retaining or improving the long-term carbon sink in the forest over time” (Long-Term Strategy, 2020, p. 81) is stated, no concrete quantitative targets are specified. This leaves flexibility to rely more heavily on international offsetting mechanisms if the national forest carbon sinks decline due to the economic use.

Although Favero et al. (2020) find that the dual use of forests for bioenergy and carbon sequestration is possible and depends on efficient policy regulating forest sequestration, the assumption that wood-based bioenergy is carbon neutral implies some caveats. Whether forest-based bioenergy is carbon neutral critically depends on forest regrowth. Modeling global responses of forest area and sequestration potential for different economic scenarios, the authors conclude that sustainability of forest-based bioenergy depends on demand. Specifically, the demand for bioenergy needs to increase significantly and reach a certain stage that induces high prices for wood resources, which in turn incentivize investments in forest regrowth and regeneration. In this scenario, bioenergy has a net positive impact on the global carbon balance. If demand increases but fails to reach a sufficient level, this incentivizes the harvesting of forests including sensitive natural forests but does not lead to investments for regeneration (Favero et al., 2020). Efficient policies to successfully regulate and increase forest carbon sequestration are either carbon rentals or combinations of taxes (penalties) and subsidies (rewards). Mere taxation of carbon emission is ineffective as this lowers demand for forest products and thus fails to secure sufficiently high prices for incentivizing investments in forest management (Favero et al., 2020). Sweden’s forests currently demonstrate net removals of CO₂ due to forest growth and Sweden envisions sustainable forestry in line with climate and biodiversity objectives “while retaining or improving the long-term sink in the forest over time” (Long-Term Strategy, 2020, p. 81).

However, as stated before, quantitative targets for net carbon uptake by Sweden's forests are lacking. Furthermore, the policy documents do not demonstrate policies that fall under the definition of efficient policies targeting forest sequestration as suggested by Favero et al. (2020) other than a carbon tax exemption of biofuels.

To summarize, Sweden constructs the net-zero norm in ways that act to set high standards for emission reductions both nationally and internationally. This is due to motivation of creating and sustaining the political image of Sweden as a moral leader in environmental and climate issues. Based on this leadership motivation, Sweden's target specification that allows for only minor contributions of CDR and offsets to achieve its net-zero ambition has symbolic value, rather than scientific integrity. It serves to communicate high ambition and leadership rather than to scientifically determine feasible and effective policy strategies. But the norm localization is shaped by motivations of economic self-interest, namely, to provide the long-term stimulus for its industry to innovate and thereby gain competitive advantage over industry elsewhere. Lastly, Sweden's engagement with the net-zero norm also serves to legitimate the large-scale use of their vast forest resources for bioenergy. This is portrayed as sustainable growth, whereas scientific studies find that the sustainability of the dual use of forests for carbon sequestration and economic purposes is less straightforward than assumed here.

5.2 The net-zero norm in China

China was one of the first rapidly emerging economies to announce the goal of achieving net-zero emissions. President Xi Jinping announced the ambition to reach peaking carbon emissions before 2030 and carbon neutrality by 2060 during the Climate Ambition Summit in 2020, which was held in relation with the 75th United Nations General Assembly in September 2020 (Zhao et al., 2022). The status of the net-zero norm, in the Chinese interpretation referred to as carbon neutrality, remained a political pledge without policy implementation demonstrating the commitment to follow up on the political pledge. In October 2021, shortly before the COP26 in the UK, China presented its Mid-Century Long-Term Greenhouse Gas Emission Development Strategy (hereafter referred to as Mid-Century Strategy) and its Action Plan for Carbon Dioxide Peaking Before 2030 (hereafter referred to as Action Plan for 2030). With the uptake of the carbon neutrality goal in the Mid-Century Strategy and in the Action Plan for 2030, China communicated its strategy for contributing towards the signatory parties of the Paris Agreement in accordance with Article 4, and anchored the goal of carbon neutrality in national policy. The status of the carbon neutrality goal thus changed from a political pledge to being implemented in policy (World Resources Institute, 2021), but does not assume the hard-law character of Climate Change Acts.

5.2.1 Interpretation of the net-zero norm

China's interpretation of the global net-zero norm for national uptake clarifies how China adapts terminology and definition, the scope of climate change driving emissions covered by the definition, as well as the time frame including interim targets (Table 3). First, China reframes the net-zero emissions norm strictly and only uses the terminology of carbon

neutrality (Action Plan for 2030, 2021; Mid-Century Strategy, 2020; Xi, 2020), without further defining the concept in any of the three analyzed sources. A single reference to the definition of the Paris Agreement is made in the Mid-Century Strategy, defining net-zero emissions as “a balance between anthropogenic GHGs emission and removals by sinks in the second half of this century” (UNFCCC, 2015, p. 4). Yet, this definition is not applied to Chinese climate policy directly but referred to in China’s engagement with the global climate regime. This reference, in combination with the wording of carbon neutrality, establishes cognitive links with the global net-zero norm without adopting the same definition, which allows for flexibility in the policy implementation. Thus, although China as a norm-taking state adapts the framing of the net-zero norm, it does not offer an explicitly reframed definition.

Second, the reframing of the net-zero emissions norm as carbon neutrality indicates that processes of localization have taken place, as the scope of climate change driving emissions covered by the Chinese interpretation of the norm is limited to CO₂ emissions only. The three sources that demonstrate how the net-zero norm is interpreted and implemented in China show that the language used to refer to the net-zero norm actively reframes the norm into the goals of carbon neutrality, peaking carbon emissions, and green and low-carbon development. Other anthropogenic GHGs receive one paragraph in China’s Mid-Century Strategy, but do not form an integral part of China’s interpretation of the net-zero norm, as the Mid-Century Strategy does not state precise reduction goals or policy measures for these additional GHGs.

Third, China defines the time frame for achieving carbon neutrality as 2060 (Mid-Century Strategy, 2020; Xi, 2020). This is in accordance with the time dimension stated in the Paris Agreement in Article 4.1 of achieving “a balance between anthropogenic GHGs emission and removals by sinks in the second half of this century” (UNFCCC, 2015, p. 4), given the vague definition of the time period being half of a century. Whereas China’s envisioned time frame thus does not diverge from the global net-zero norm, it differs from other norm taking states’ interpretations. Other states interpret this to signify achieving net-zero emissions by or before the second half of the century, such as Sweden’s Climate Goal of achieving net-zero emissions by 2045.

Fourth, regarding the interim targets on the road to achieving carbon neutrality, China sets out five targets that are framed as milestones guaranteeing the achievement of carbon neutrality by 2060. The most important interim target that at the same time is part of China’s definition of carbon neutrality is the goal of peaking carbon emissions before 2030 (Action Plan for 2030, 2021). The remaining four targets are closely related to the goal of peaking carbon emissions, as their time frame is set for 2030 as well, with no additional interim targets set for the time thereafter. These targets are a 65% reduction of CO₂ emissions per unit of Gross Domestic Product (GDP) by 2030 compared to 2005 levels; an increase in the share of non-fossil fuels in total energy consumption to 20% and in primary energy consumption to 25% by 2030; an increase in the forest stock volume by 6 billion cubic meters from the 2005 levels; and a total installed capacity of solar and wind of over 1.2 billion kilowatts (Action Plan for 2030, 2021; Mid-Century Strategy, 2020; Xi, 2020).

Table 3. China's interpretation of the net-zero norm, based on President Xi Jinping's Speech at the Climate Ambition Summit (2020), China's Mid-Century Long-Term Low Greenhouse Gas Emission Development Strategy (2021) and the Action Plan for Carbon Dioxide Peaking Before 2030 (2021).

China's interpretation of the net-zero emissions norm

Terminology	Carbon neutrality
Emissions covered	CO ₂ emissions
Timeframe	Reaching carbon neutrality by 2060
Interim targets	<ul style="list-style-type: none"> • Carbon peaking before 2030 • 65% reduction of CO₂ emissions per unit of GDP by 2030, compared to 2005 levels • Increase the share of non-fossil fuels in total energy consumption to 20% and in primary energy consumption to 25% by 2030 • Increase the forest stock volume by 6 billion cubic meters from the 2005 levels by 2030 • Bring totally installed solar and wind capacity to over 1.2 billion kilowatts by 2030

A critical evaluation of China's interpretation of the net-zero norm concerns the definition of net-zero emissions as carbon neutrality and thereby applying the concept of net-zero emissions only to CO₂. Framing and interpreting the net-zero emissions norm as carbon neutrality limits the scope of emissions to reach net zero under the official Chinese target to CO₂ emissions only. This simplifies the problem of anthropogenic climate change. CO₂ indeed presents the most important GHG to reduce due to its high global warming potential as well as it making up the majority of GHG emissions (Rogelj et al., 2021). However, there are other potent GHG emissions next to CO₂, and although these have a lower global warming potential measured on the time scales of CO₂ and lower absolute emissions, they still act as GHGs in the atmosphere (Fuglestedt et al., 2018). Such other GHGs are emissions of CH₄, N₂O and f-gases. Low-carbon strategies are needed to reduce the most important driver of climate change, but reducing the problem to carbon emissions only bears the danger of oversimplification that does not capture the complexity of climate change. Given that academics have conceptualized climate change as not only a wicked but a super wicked problem (Lazarus, 2009; Levin et al., 2012), relying on reductionist approaches poses the risk of not addressing climate change effectively.

Another point of critique relates to the interim goals that present milestones in China's strategy for achieving the long-term goal of carbon neutrality. Whereas the stated goal of achieving peaking carbon emissions before 2030 and carbon neutrality by 2060 require absolute emission reductions of CO₂, none of the remaining interim targets are formulated as direct emission reductions targets. For example, reducing the carbon intensity of GDP does

not necessarily result in absolute emission reductions. As the carbon intensity of GDP refers to the ratio of carbon emissions per unit of gross domestic product, it can be lowered not only by reducing carbon emissions, but also by increasing GDP through economic growth while holding emissions constant (Hubacek et al., 2021). Likewise, increasing the share of non-fossil fuels in energy consumption does not result in absolute emission reductions when the overall energy consumption increases by the same amount of energy generation substituted by low-carbon energy sources (Parrique et al., 2019). Increasing natural carbon sinks such as forests do not affect the amounts emitted by human activities directly and thus do not act to directly reduce emissions (Lewis et al., 2019). Rather, afforestation and forest plantations absorb CO₂ that was already emitted to the atmosphere, and store it only semi-permanently in the form of carbon in biomass (Eriksson, 2020).

5.2.2 Implementation of the net-zero norm

The implementation of the net-zero norm into the Chinese context as the concept of carbon neutrality is mostly achieved through the Action Plan for 2030. The Action Plan for 2030 sets the goals for reaching the interim target of peaking carbon emissions before 2030, which is framed as the most important milestone towards carbon neutrality in 2060 (Action Plan for 2030, 2021). At the same time, the Action Plan for 2030 presents the only long-term climate policy, with no specific policy in place for the time period between 2030 and 2060 yet. As the interim target for reaching carbon neutrality by 2060 is to achieve peaking carbon emissions, the policies and targets established for 2030 are not tied to absolute emission reduction goals. Instead, their goal is to slow down the growth in emissions until this growth, but not overall emissions, eventually reaches zero. This means that China plans absolute emission reductions only for the time period after 2030, a time period for which no climate policies exist as of now. Consequently, only the interim target towards China's interpretation of the net-zero norm as carbon neutrality is implemented into policy, but the actual ultimate goal of carbon neutrality is not. Therefore, as the document analysis reveals, many of the sectoral policy targets and mechanisms aim at achieving peaking emissions, often through efficiency and energy saving measures.

China's four major strategies for achieving the interim goal of peaking carbon emissions by 2030 are to reduce the carbon intensity of GDP by 65% compared to 2005 levels (Mid-Century Strategy, 2020); to increase the share of non-fossil fuels in total energy consumption to 20% and in primary energy consumption to 25% (Action Plan for 2030); to increase the forest stock volume by 6 billion cubic meters from the 2005 levels; and deploy a total installed capacity of solar and wind of over 1.2 billion kilowatts, all by 2030 (Mid-Century Strategy, 2020) (Table 2). The overall strategy of China's policy approach for achieving first peaking carbon emissions and subsequently carbon neutrality is to put the country on a path of green and low-carbon development, as stated numerous times in both the Mid-Century Strategy and the Action Plan for 2030. The analysis of these sources shows that the policy mix employed by China to implement the net-zero norm employs the following policy types, listed in descending order of use in the policy documents: policies promoting

certain objectives without clear instruments used, economic policies using market-based instruments, regulative policies using restrictive bans or standards, and communicative policies focusing on information provision and education.

The largest share of policy measures in the Mid-Century Strategy presents policies promoting certain objectives. This policy type does not come with quantitative targets and timeframes for further clarifying concrete mechanisms to achieve these objectives. Due to the vague language used, these policy statements do not allow for identifying and subsequently evaluating specific climate policy instruments. Therefore, this type of promoting policies resembles aims and visions rather than precise and transparent practical measures. The Mid-Century Strategy targets the sectors of electrification, buildings, urban infrastructure, industrial production, consumption, transport, technological innovation and technology deployment through promoting the development of green and low-carbon solutions in these areas (Mid-Century Strategy, 2020). However, the Mid-Century Strategy does neither set quantitative targets that operationalize this intention nor provide transparency about the mechanisms planned to realize this intention. This leaves room for interpretation whether the implementation will assume regulative character, provision of financial support or other nature. Only for the objective of promoting the “transition of the energy structure to a clean and low-carbon direction” (Mid-Century Strategy, 2020, p. 15), the Mid-Century Strategy does specify quantitative targets: by 2030, the share of non-fossil fuels in energy consumption should reach about 25% and the total installed capacity of solar and wind power should reach over 1.2 billion kilowatts. By 2060, China aims to “fully establish a clean, low-carbon, safe and efficient energy system, reach energy efficiency at international advanced levels, and improve the proportion of non-fossil fuels in energy consumption up to over 80%” (Mid-Century Strategy, 2020, pp. 8-9).

In the domain of promoting policies, the Action Plan for 2030 offers more transparency about specific measures, timeframes and targets than the Mid-Century Strategy. In the electrification sector, the Action Plan for 2030 specifies that in “trans-regional transmission of power generated by new energy resources, we will strictly control the scale of supplementary coal power” (Action Plan for 2030, 2021, p. 5) and that eventually, the burning of bulk coal will be prohibited. Additionally, by 2025 the “installed capacity of new types of energy storage will reach 30 gigawatts or more [and by] 2030, installed pumped-storage hydro power capacity will reach approximately 120 gigawatts” (Action Plan for 2030, 2021, p. 9). In the building sector, the Action Plan for 2030 establishes the objective that by 2025, 8% of the energy consumed in buildings will stem from renewable resources. Moreover, all newly constructed urban buildings will meet green building standards. In the transport sector, the goal for 2030 is to reach a 40% share of incremental vehicles to be fueled by clean energy. The carbon emission intensity of vehicles is envisioned to be curbed by 9.5% and the energy consumption of national railways should be cut by 10% compared to 2020 levels. Additionally, between 2021 and 2025, “the volume of rail-ship container transportation will increase above 15% annually [and by] 2030, no less than 70% of travel will be conducted

through environmentally friendly means in cities with permanent populations of one million or more” (Action Plan for 2030, 2021, p. 20).

Economic instruments are another category of policy measures set out to contribute towards achieving first the mid-term goal of peaking carbon emissions and thereafter the long-term goal of carbon neutrality. These instruments are based on the logic of the market to allocate emission reductions to those actors who can achieve these at the lowest marginal costs, and thereby achieve overall efficiency. The most important policy instruments referenced are the construction of national carbon markets and a tax system. The Mid-Century Strategy states the objective of giving “full play to the role of market mechanisms in controlling GHG emission, accelerate the establishment and stable operation of a national carbon emission trading market” (Mid-Century Strategy, 2020, p. 27). Next to “enhance[ing] the role of market mechanism” (Mid-Century Strategy, 2020, p. 10) through the construction of national carbon markets with “steadily expand[ing] the coverage of industries and types of GHGs” (Mid-Century Strategy, 2020, p. 27), the participation in international carbon markets is also planned. Additionally, the Action Plan for 2030 states the aim of establishing a “tax policy system that is conducive to green and low-carbon development” (Action Plan for 2030, 2021, p. 36), which targets energy and water conservation as well as the use of resources.

Regulative policies assuming the character of command-and-control instruments, which directly regulate activities and emissions through setting quotas or bans, do not feature prominently in China’s policy implementation of the net-zero norm. Regulative policies concern coal and fossil fuel consumption as well as green standards for the industrial and building sector. However, they remain vague with regards to concrete restrictions and requirements put in place to regulate GHG emissions. The Action Plan for 2030 states the intention that China will increase “the pace in cutting coal consumption, strictly and rationally limit the increase in coal consumption over the 14th Five-Year Plan period and phase it down in the 15th Five-Year Plan period” (Action Plan for 2030, 2021, p. 5). Simultaneously, severe restrictions and standards on new coal power projects are planned to “pursue development of a modern coal-based [...] industry” (Action Plan for 2030, 2021, p. 15). Similarly, the Mid-Century Strategy promotes the “clean utilization of coal [...] [and to] control the growth of coal consumption” (Mid-Century Strategy, 2020, p. 15) with a gradual reduction envisioned for the period between 2026 and 2030 for both coal and oil.

Communicative policies that use informative and educational instruments have only minor importance in the Chinese policy implementation of the net-zero norm. The Mid-Century Strategy states the objective of advocating for “a simple, moderate, green and low-carbon life philosophy” (Mid-Century Strategy, 2020, p. 12) and “enhance the public’s awareness of green and low-carbon consumption” (Mid-Century Strategy, 2020, p. 27). This will be done through public activities on environmentally themed days, such as World Earth Day, National Low-Carbon Day and Energy Saving Publicity Week. Educating students and government officials in Xi Jinping’s ideology of ecological civilization, which proposes guiding norms and principles shaping the human relation to nature in China, is also planned (Action Plan for 2030, 2021). Overall, China’s implementation of the net-zero norm into

national policy and long-term strategies remains vague due to the lack of quantitative targets for several objectives stated in the policy documents. In other cases where quantitative targets are specified, they remain obscure as Chinese policy uses ambiguous definitions that allow for flexibility in policy implementation. This is demonstrated most clearly in the policies targeting the energy sector, which is among the sectors creating the largest share of annual emissions in China (Zhang & Chen, 2022) and is thus of great importance for achieving carbon neutrality. Whereas the interim targets for the total installed capacity of wind and solar energy and the increase in the share of non-fossil fuels in total energy consumption are of quantitative nature, a definition for non-fossil fuels is not directly offered. Analyzing the entire policy documents, however, clarifies that China's understanding of sustainable energy as alternatives to fossil fuels does not only refer to renewables such as wind and solar, but also to biomass, nuclear power as well as clean and efficient use of fossil fuels and coal (see next section). Moreover, no quantitative targets are specified for the reduction of energy generated from coal, which is the most polluting and most carbon intense source of energy (Steckel et al., 2015). Regulative policy targeting coal in the Climate Action Plan for 2030 does not state the immediate objective of reducing energy produced from coal in absolute terms, but to limit the increase in energy production from coal. Gradual reductions in the quantities of energy produced from coal are envisioned to enter into force in the period between 2026 and 2030, with no clear commitment to an end date of coal or clear reduction targets as mentioned above.

5.2.3 Influential norms and ideas in the localization of the net-zero norm

Norms and ideas that influence the local adaptation of the global net-zero norm highlight China's goals of national economic growth and international recognition as a developing country with limited responsibility and capability for climate change mitigation. First, the focus on efficiency as an overarching principle and a viable strategy to address GHG emissions demonstrates a market-liberal perspective on the problem of climate change. Second, the broad definition of alternative and thus sustainable energy ranging from solar and wind power to the clean and efficient use of fossil fuels allows for flexibility in policy implementation without severely constraining national energy production. And third, simultaneous emphasis on the threats of climate change to national economic development and its large contributions to climate change mitigation serve to position China in a place where no additional demands can be made from the international community.

First, the idea of efficiency serves as the foundation and simultaneously as the overarching goal of China's low-carbon development strategies. In China's implementation of the net-zero norm into policy, efficiency is understood both as an objective of itself and as a solution in several sectors. The Mid-Century Strategy states the goal of "improving energy efficiency [...] [and establishing] a clean, low-carbon, safe and efficient energy system" (Mid-Century Strategy, 2020, p. 8). Along these lines, additional goals are to "improve the efficiency of industrial energy utilization" (Mid-Century Strategy, 2020, p. 16) and "base economic and social development upon highly efficient utilization of resources" (Action Plan

for 2030, 2021, p. 2). Moreover, China aims to “[push] forward the energy production and consumption revolution [through] vigorously improve[ing] energy utilization efficiency” (Mid-Century Strategy, 2020, p. 15). Next to this application in energy and electricity consumption, the efficiency notion also extends to the “clean and efficient use of fossil fuels” (Action Plan for 2030, 2021, p. 12) as part of the low-carbon strategy. This focus on efficiency demonstrates that the primary goal of the China’s norm implementation is not a fundamental and systemic change to eliminate the drivers of anthropogenic GHG emissions. Rather, the goal is to decouple emissions from economic growth. This represents the definition of the efficiency concept, meaning that the ratio of input used compared to the output emitted decreases (Alcott, 2005), and is thus in parallel to the climate goal of peaking carbon emissions. For achieving this, the Mid-Century Strategy emphasizes that developing and accelerating the uptake of “sustainable energy consumption technologies including [...] energy-efficiency improvement can work as the emission reduction measures with the lowest cost and the most synergistic benefits” (Mid-Century Strategy, 2020, p. 26).

This focus on efficiency as the foundation for low-carbon development, which should be achieved through technological innovation and drive economic development, follows a market-liberal logic that perceives economic growth as the solution to environmental issues. China’s localization of the net-zero norm demonstrates that economic growth continues to be a major policy objective, and that economic growth is framed as sustainable development under the premises of increased efficiency. This framing of sustainability to be attainable through economic development, because it coincides with decreased pressure on the environment due to efficiency improvements, relates to the idea of the Environmental Kuznets Curve (EKC). The logic of the EKC postulates that environmental degradation is limited to the early stages of nations’ development. Environmental degradation per capita increases with increases in economic development, until a peak is reached after which further economic growth leads to reduced environmental impact (Kaika & Zervas, 2013). Whether this logic has empirical validity, however, remains questionable. The literature finds mixed results (Kaika & Zervas, 2013) and remains inconclusive due to variations in context, time period and explanatory variables assessed (Apergis, 2016; Shahbaz & Sinha, 2019).

Moreover, the effect of increased efficiency for reducing absolute GHG emissions can be annulled by increased consumption that results from the economic gains due to efficiency improvements. This is also referred to as the Jevons’ Paradox that goes back to the British economist William Stanley Jevons (Alcott, 2005; Sorrell, 2009). Already in the 19th century, he theorized that improvements in energy efficiency will result in energy consumption increases instead of decreases. This would imply that energy efficiency measures would not lead to overall emission reduction but emission increases (Sorrell, 2009) if the energy mix itself is not transformed to low-carbon energy sources.

Second, for achieving the stated objective of peaking carbon emissions in 2030 and carbon neutrality in 2060, China adopts a broad definition of alternative energy sources that are framed as sustainable energy. On the one hand, this definition covers various energy sources considered as renewable energy. The Mid-Century Strategy establishes the interim

goal of an installed capacity of 1.2 billion kilowatts of wind and solar power in 2030 based on the objective to “vigorously develop renewable energies including wind, solar, biomass and marine energies [and] hydropower” (Mid-Century Strategy, 2020, p. 15). On the other hand, China’s scope of alternative and sustainable energy also extends to energy sources that are considered non-renewable energy sources with a finite stock. This is demonstrated in the plan to “[v]igorously promote [the] clean utilization of coal” (Mid-Century Strategy, 2020, p. 15) and fossil fuels, and “pursue development of a modern coal-based [...] industry” (Action Plan for 2030, 2021, p. 15). Additionally, China plans to “speed up the large-scale exploitation of unconventional oil and gas resources including shale gas, coal bed gas, and tight oil and gas” (Action Plan for 2030, 2021, p. 8). This also includes encouraging “the substitution of sources like [...] natural gas to coal” (Action Plan for 2030, 2021, p. 13) and promoting the use of liquefied natural gas next to biomass fuels in the transport sector. And last, China’s definition of sustainable energy also covers nuclear power. The Mid-Century Strategy clarifies that China will “[p]roactively develop nuclear power [...] and increase the research and development of advanced nuclear energy [...] so that nuclear power will continue to play an important role” (Mid-Century Strategy, 2020, p. 27).

Besides that, China plans to develop and expand its energy generation from biomass sources under the label of sustainable energy. Biomass fuels are understood as sustainable fuels to substitute fossil fuel energy carriers, however, the policy documents offer no further definition on what sustainable biomass entails. In general, biomass energy is considered a renewable type of energy because it includes the generation of energy from the combustion of wood and crops, which present natural resources that can regrow after being captured (Creutzig et al., 2015; Wang et al., 2018). The source and sink hypothesis means that although the combustion of biomass roughly emits the same amount of GHGs into the atmosphere as fossil fuels, biomass is neutral as the photosynthesis takes up the equivalent amount of carbon from the atmosphere. In this logic, biomass energy reduces overall emissions when the rate of renewal of biomass exceeds the rate of biomass consumption (Creutzig et al., 2015; Destek et al., 2021). Broader definitions of bioenergy also include biofuels and biogas that can be generated from other sources such as municipal waste, agricultural residues and plain charcoal. While many studies find positive environmental impacts that point to the carbon saving effects of bioenergy (Wang et al., 2018), others that assess other ecological impacts find that the negative impacts on cropland, grazing land, fishing grounds and especially forest lands exceed the positive impacts of reducing atmospheric emissions (Destek et al., 2021). Creutzig et al. (2015) conclude that the consequences of bioenergy for sustainability depend on the technology as well as land category used, the location, scale and pace of implementation, the governance system and the business models. Consequently, the climate change mitigation impacts of bioenergy use are not as straight forward as portrayed in China’s policy documents. But framing it as sustainable legitimizes potential use of China’s large (planted) forest resources for energy production.

Third, China uses its net-zero ambition to situate itself within the international climate regime by framing its carbon neutrality goal as an outstanding commitment that exceeds

expectations the international community can pose to China. In a first step, President Xi Jinping calls for global cooperation and contribution from all countries that adopted the Paris Agreement. In his speech at the Climate Action Summit in 2020, he emphasizes that “[i]n meeting the climate challenge, no one can be aloof and unilateralism will get us nowhere. Only by upholding multilateralism, unity and cooperation can we deliver shared benefits and win-win for all nations” (Xi, 2020). In a second step, China portrays itself as a victim to the threats of climate change in stating that “China is one of the countries most adversely affected by climate change. The proportion of economic losses caused by climate change in GDP is much higher than the global average” (Mid-Century Strategy, 2020, p. 6). Additionally, the Mid-Century Strategy emphasizes that “China is still a developing country and faces multiple challenges, such as developing the economy [...]. Compared with developed countries, China will face greater difficulties and challenges in achieving a [...] low-carbon transition in a relatively short period of time” (Mid-Century Strategy, 2020, pp. 8-9).

Despite this framing as a developing country with limited capabilities, China continues to highlight its past achievements in climate change mitigation in a third step. Among these achievements listed are China’s “historic and fundamental contributions to the conclusion, entry into force and implementation of the Paris Agreement” (Mid-Century Strategy, 2020, p. 3) as well as its reductions of carbon intensity of capital from 2005 to 2019 by 48% (Mid-Century Strategy, 2020, p. 8). And in a fourth step, China calls for increased support from developed countries to developing countries. This is done by referring to the principles of Common But Differentiated Responsibilities and Capabilities (CBDRC) central to the Paris Agreement. In his speech at the Climate Action Summit 2020, President Xi Jinping says “developed countries need to scale up support for developing countries in financing, technology and capacity building” (Xi, 2020).

Together, these four strands of narrative frame China as a developing country that is not only victim to the threats climate change poses for its economic development, but also has only limited capacity to reduce its own contribution to the issue. China frames its action as evidence for its great leadership despite being a developing country. Based on this, it makes further claims that developed countries should assume greater responsibility. This narrative surrounding China’s commitment to carbon neutrality thus aims to gain recognition for China’s actions and ambitions. At the same time, this localization of the net-zero norm acts to invoke moral concerns that discourage developed countries to critically scrutinize China’s ambition and make additional demands.

5.3 The net-zero norm in Fiji

Fiji first adopted the net-zero norm in 2018 by implementing it in its National Climate Change Policy 2018-2030 as well as in its Low Emissions Development Strategy: 2018-2050. The objective of the National Climate Change Policy to develop a legal mandate for this climate target eventually resulted in the institutionalization through the Climate Change Bill 2021, which takes the form of a Climate Change Act (Grantham Research Institute on Climate Change and the Environment, 2021; World Resources Institute, 2021). The status of

the net-zero norm in Fiji thus evolved from being included in national policy to being reaffirmed internationally under the procedures of the Paris Agreement and ultimately being set in national law. The National Climate Change Policy (hereafter abbreviated as NCCP) (2019) establishes the long-term goal of achieving net-zero emissions by 2050 as well as several medium-term goals for 2030. The Low Emissions Development Strategy 2018-2050 (hereafter referred abbreviated as LT-LEDS) (2018) states Fiji's policy goal of achieving net-zero carbon emissions of the entire national economy by 2050. Directly related to that, it presents four low emission scenarios ranging from business-as-usual to very high ambition to guide the design of pathways towards net-zero (LT-LEDS, 2018). The Climate Change Act, on the contrary, rephrases the net-zero target set in the LT-LEDS to extend from net-zero carbon emissions to net-zero GHG emission by 2050 (Climate Change Bill 2021, 2021).

5.3.1 Interpretation of the net-zero norm

Fiji's interpretation of the global net-zero norm for domestic uptake is demonstrated in its formal operationalization of terminology and definition, the scope of climate change driving emissions covered by the definition, as well as the time frame including interim targets (Table 4). First, Fiji remains ambiguous in its terminology used for nationally implementing the net-zero norm, stating the terms net-zero emissions, (at least) net-zero GHG emissions, net-zero carbon emissions, economy-wide decarbonization and carbon neutrality interchangeably both across and within policy documents. Adding to this ambiguity that is caused by the indistinct use of terminology is the lack of a further definition to explain the meaning of the net-zero norm. In contrast to the many concepts defined for legal application in the Climate Change Bill, Fiji's policy documents do not offer an explicit definition nor refer to the definition of net-zero emissions presented in the Paris Agreement. However, Fiji does establish reference to the Paris Agreement by emphasizing the international objective to limit global climate change to 1.5°C. In doing so, Fiji explicitly differentiates between its own net-zero ambition and the requirement of global net-zero emissions for addressing the "climate emergency" (Climate Change Bill 2021, 2021, p. 20).

Second, the ambiguity in the terminology used to implement the global net-zero norm at the national level extends to the scope of emission that are covered in Fiji's localization of the net-zero norm. The terminology used in the Climate Change Bill frames the norm as achieving net-zero GHG emissions by 2050 and defines the concept of GHGs to include CO₂, CH₄, N₂O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆) and nitrogen trifluoride (NF₃) emissions (Climate Change Bill). However, the two policy documents setting out the specific strategies to achieve net-zero emissions, which are the LT-LEDS and the NCCP, use terminology referring both to reducing carbon emissions only and to reducing GHG emissions generally. The LT-LEDS indicates the specific emission category relevant in individual sectors and thus seems to incorporate additional GHGs next to CO₂ in its scope. But the NCCP often relies on the terminology of net-zero carbon emissions and does not mention additional GHGs such as CH₄, N₂O or f-gases at all. The territorial scope of the net-zero norm that establishes the reach of responsibility Fiji assumes, on the other hand,

is clearly defined by the Climate Change Bill to all activities within Fiji's territorial borders. This includes its internal waters up until its exclusive economic zone, but excludes emissions from international shipping and aviation (Climate Change Bill 2021, 2021).

Third, the timeframe Fiji sets for its adaptation of the global net-zero norm is defined as achieving net-zero emissions by 2050 (Climate Change Bill 2021, 2021; LT-LEDS, 2018). In its LT-LEDS, Fiji also mentions the possibility of achieving even net-zero emissions by 2050, depending on the level of international support in the form of financial assistance. This interpretation is in line with the global definition of the timeframe set to the second half of this century or by mid-century.

Fourth, Fiji sets both quantitative as well as qualitative interim targets for the medium-term timeframe of 2030 that are envisioned to present milestones towards achieving the long-term goal of net-zero emissions by 2050. The NCCP only states one quantitative target for 2030, which is to generate 100% of the national electricity production from renewable energy sources. The remaining targets of decarbonizing the transport sector as well as preserving and enhancing natural carbon sinks are of qualitative nature (NCCP, 2019). The LT-LEDS states the same electricity target, through which the additional target of reducing Fiji's total carbon emissions by 30% should be fulfilled (LT-LEDS, 2018). However, Fiji's own national policy measures are only expected to contribute about one third and result in reducing 10% of carbon emissions by 2030, "while the rest would require external funding" (LT-LEDS, 2018, p. 43). This conditional nature of policy target is based on the modeling of four future scenarios for Fiji's emission development that is dependent on different levels of ambition and shapes sectoral long-term targets throughout the policy document. For example, the envisioned capacities of installed renewable energy in 2050 range from 245 MW under the business as usual (BAU) unconditional and thus least ambitious scenarios, to 1943 MW under the very high ambition scenario (LT-LEDS, 2018).

Table 4. Fiji's interpretation of the net-zero norm, based on the Long-Term Low Greenhouse Gas Emission Development Strategy (2018), the National Climate Change Policy (2019), and the Climate Change Bill (2021).

Fiji's interpretation of the net-zero emissions norm

Terminology	Net-zero GHG emissions vs. net-zero carbon emissions / carbon neutrality
Emissions covered	GHGs vs. CO ₂
Timeframe	2050 (2045 in Very High Ambition Scenario)
Interim targets	<ul style="list-style-type: none"> • To derive 100% of national electricity production from renewable energy sources by 2030, which, combined with economy-wide efficiency measures will reduce overall emissions by 30% - but only 10% to be achieved through national policy, the rest conditional on external funding • To decarbonize the transport sector • To preserve and enhance natural carbon sinks

A critical evaluation of Fiji's interpretation of the net-zero norm concerns the unclear definition of net-zero emissions. Whereas sometimes this is stated to include all GHGs, at other times the terminology of net-zero carbon emissions or carbon neutrality refers to CO₂ emissions only. The terminology used in Fiji's Climate Change Bill, which presents the legal foundation and establishes procedural rules for climate policy-making, corresponds to GHGs in general. The policies implementing the norm in strategies, however, use terminology covering carbon emissions only versus all GHGs interchangeably. This ambiguous terminology, without a precise definition of what the net-zero norm means in Fiji's localization thereof, obscures Fiji's ambitions for climate change mitigation. Therefore, this creates transparency issues that are further exacerbated by the lack of quantitative targets besides the interim goal of generating 100% of electricity from renewable energy sources (NCCP, 2019). The qualitative interim targets presented, being the decarbonization of the transport sector and the preservation and enhancement of Fiji's natural carbon sinks (NCCP, 2019), are not further defined and thus remain unclear.

5.3.2 Implementation of the net-zero norm

Fiji implements the net-zero norm in the medium-term through its NCCP that covers a timespan from 2018 to 2030, whereas the long-term implementation is achieved through Fiji's LT-LEDS that extends until the year of 2050. While the NCCP establishes national policy goals functioning as interim targets for 2030, it remains rather vague in the mechanism and instruments that are envisioned to achieve said targets. Rather, it lays out general approach and important principles and values taken into account for the policy making, such as resilient development, gender equity, sustainable well-being, etcetera. It also establishes a range of policy objectives, however, none of them directly relate to concrete actions of reducing own

national emissions or relate to the interim targets. These policy objectives mentioned in the NCCP focus on political aspects such as Fiji's aspired leadership on climate change action. Other objectives relate to the coordination between SIDS states or to build alliances in the Pacific for enhancing the stewardship of the oceans, an issue Fiji prominently links to the issue of climate change in several policy documents.

In contrast, the LT-LEDS illustrates additional short-, medium- and long-term targets of quantitative nature, which correspond in their ambition to different levels of external funding. The four scenarios presented include 1) the BAU Unconditional scenario with policies and targets that Fiji plans to implement irrespective of international financing, 2) the BAU Conditional scenario, which refers to the implementation of existing policies and targets where Fiji relies on international financing for mitigation actions, 3) the High Ambition scenario that projects ambitions exceeding Fiji's existing policies and targets, for which Fiji depends on international financing and 4) the Very High Ambition scenario, which projects further increased ambitions compared to the High Ambition scenario and thus depends on even higher levels of international financing for mitigation action (LT-LEDS, 2018). According to the LT-LEDS, Fiji can achieve net-zero emissions and also potentially net-negative emissions only in the case of the Very High Ambition scenario with high levels of international financing (LT-LEDS, 2018). As this strategy of showcasing scenarios of different ambitions and their impacts in various sectors of Fiji's economy serves the aim of demonstrating the need for international climate finance, concrete policy instruments and mechanisms to implement these targets receive only little explanation in the LT-LEDS.

Due to the focus on guiding principles and leverage points in larger political processes in the climate regime, and the emphasis on differential outcomes under low to high ambition scenarios, distilling Fiji's overall policy approach is bound to be incomprehensive. The analysis suggests that Fiji's policy approach to implement the net-zero norm focuses on promoting policies, meaning either direct government funding or indirect government funding through international climate finance. Regulative and informative policy instruments appear to be of roughly equal importance but play a minor role compared to the promoting policy types. Economic instruments to steer society through financial incentive structures are only of minor importance in Fiji's implementation of the net-zero norm in national policy.

Promoting instruments present the majority of policy measures presented in the NCCP and the LT-LEDS that cover the energy and transport sectors for reducing emissions. With increasing ambition throughout the scenarios, Fijian policy states to promote the installation of increasing renewable energy capacities. Whereas the least ambitious BAU Unconditional scenario, which corresponds to current national policy, also promotes the new installation of fossil fuels (LT-LEDS, 2018), the more ambitious scenarios promote the installation of renewables only. In the transport sector, the LT-LEDS further promotes (hybrid) electric vehicles, with government investments increasing according to the ambition scenarios. This is planned as the decarbonization of the transport sector "will require strategic policies and investments that catalyse and incentivise change" (LT-LEDS, 2018, p. 89). Additionally, the "[p]romotion of public transport and non-motorized transport systems" (LT-LEDS, 2018, p.

7) as well as the objective “to promote transport mode shifts” (LT-LEDS, 2018, p. 90) should act to further reduce emissions. In the area of non-road transport, the Fijian government plans to promote research for the decarbonization of domestic marine transport in either of the scenarios. The replacement of existing aircrafts by more efficient or electric aircrafts, however, depends on the ambition scenario but is not planned in the BAU Unconditional scenario. A general trend is that the more ambitious the targets in the energy and transport sectors in the respective scenarios, the more weight the promoting policies gain as funding instruments for emission reductions. At the same time, the promoting instruments in all scenarios but the BAU Unconditional rely on external funding. Thus, as the LT-LEDS does not set out a transparency framework with criteria for decision-making to determine what levels of received climate finance equal which ambition scenario is to be implemented, high uncertainty with regards to which promoting policies will actually be implemented exists.

Regulative instruments form the second pillar of policy instruments and take the form of standards in the areas of buildings, industry and energy as well as restrictions in fuel use and deforestation activities. Energy performance standards for industry and buildings will be implemented through the ISO 50001 standard in order to increase energy efficiency. Additionally, “Minimum Energy Performance Standards and Labelling [...] are implemented for all electrical appliances” (LT-LEDS, 2018, p. 183). However, both of these measures are included only in the scenarios exceeding the BAU Unconditional scenario (LT-LEDS, 2018). With regards to the direct restrictive instruments, “the use of wood fuel for cooking is eliminated by 2030” (LT-LEDS, 2018, p. 72) under scenarios exceeding the BAU Unconditional scenario as well (LT-LEDS, 2018). To reduce emission from deforestation, restrictions are placed on the use of natural areas and projected areas are designated. In the least ambitious scenarios that correspond to the unconditional and conditional BAU policies, the target for reducing emission from deforestation is set to 10% while additional afforestation measures to increase the natural carbon sinks do not exist (LT-LEDS, 2018). In the two more ambitious scenarios that require high levels of international financing, the targets for reducing emission from deforestation are set to 20% in the High Ambition scenario and 80% in the Very High Ambition scenario. Afforestation targets to increase Fiji’s forest area by 10,000 ha and 77,400 ha, respectively, complement these deforestation targets (LT-LEDS, 2018).

Fiji’s informative instruments to reduce emissions focus on capacity building and education activities for increasing energy and fuel efficiency as well as reducing the deforestation of natural forests and sustainable forest management. As the “transition to a low carbon economy will require far-reaching changes, not only in technology but also in day-to-day decision-making [...] awareness raising, capacity building, and education measures across the whole economy” (LT-LEDS, 2018, p. 202) are needed. Examples of such measures include the eco-driving training for truckers and new driving license education, the training for wood fellers to reduce the logging of natural forests in all ambition scenarios, and the training and capacity building in the restoration and replantation of mangrove forests. Besides

the latter, all capacity building measures are implemented in all scenarios including the BAU Unconditional scenario (LT-LEDS, 2018).

Economic instruments such as taxes or subsidies functioning as incentive structures for steering society are the least used instrument in Fiji's implementation of the net-zero norm. In the individual transport sector, "financial incentive schemes for importers and vehicle purchases to encourage the adoption of HEVs [hybrid electrical vehicles] and EVs [electrical vehicles]" (LT-LEDS, 2018, p. 91) are considered. To encourage a mode shift to public transportation, supply side measures in the form of subsidies are considered, but due to the high investment costs not favored in the LT-LEDS. Additionally, either a tax exemption or a subsidy for biofuels to support the increased uptake and partial displacement of fossil fuels will be implemented under each of the ambition scenarios. Next to these economic incentives encouraging the uptake of new technologies, incentives in the form of "dynamic tariffs that incentivise customers to charge EVs [electric vehicles] when optimal" (LT-LEDS, 2018, p. 90) are implemented to manage national power demand through price signals.

Overall, Fiji's implementation of the global net-zero norm into national policy remains conditional on the support by international financing, as demonstrated through the modeling of the four scenarios in the LT-LEDS. This is further expressed in the fact that most policies targeting Fiji's sectors creating the largest amounts of emissions, which are mainly the energy and the transportation sector, fall under the promoting instruments category. As these promoting policies mean government expenditure for implementing emission reduction measures, and this expenditure is dependent on the level of external financing, high uncertainty remains if Fiji will achieve its target of net-zero emissions by 2050. It also demonstrates Fiji's larger approach towards the net-zero norm: instead of focusing on economic or regulative instruments to steer emission reductions in the most polluting sectors, Fiji aims to capture the global net-zero norm for leveraging international finance. Through this, Fiji allocates the responsibility of reducing national emissions to the international arena. Besides this, Fiji has a large interest in ensuring an ambitious global understanding of net-zero emissions. This is because it is already experiencing negative impacts of climate change and will increasingly be doing so in the future. In light of its high vulnerability yet low influence on mitigating climate change, which due to its low contribution thereto, it heavily relies on the action of others. Therefore, aiming to influence other states in the climate regime through the net-zero norm presents an underlying motivation in Fiji's norm localization (see also next section).

5.3.3 Influential norms and ideas in the localization of the net-zero norm

Fiji's localization of the global net-zero norm functions as an engagement platform with other states. On the one hand, it functions as means to raise demands to the rest of the world with regards to climate ambition as well as climate finance, and on the other hand acts to link issues of ocean sustainability to the climate change problem. Consequently, by adopting the global norm and adapting it to strategic objectives, Fiji aims to capture the net-zero norm for its self-interests. These present pursuing economic development and receiving international

support for climate change mitigation, thus avoiding responsibility for this. This is demonstrated in the emphasis of several norms and framings demonstrating Fiji's disadvantaged position with regards to climate change impacts and its development status, which bear moral obligations for other states. Additionally, and in order to raise the global ambition of climate change mitigation, Fiji employs a global emergency framing to raise demands to the international community of striving for a global net-zero world. Moreover, with the objective of influencing the climate regime for aspects outside the central problem conception, Fiji engages in issue linking of ocean sustainability and climate change. The motivation for this bandwagoning, meaning linking and constructing the ocean as an important aspect of the climate change problem, most likely arises from the political salience and associated institutional framework of the climate regime compared to the much more fragmented ocean regime (van Leeuwen, 2015).

First, in order to leverage international climate finance as well as technology transfer and capacity building for climate change mitigation, Fiji emphasizes its vulnerability to the impacts of climate change. In combination with emphasizing its status of a developing country, this highlights Fiji's its limited capabilities to address climate change. This prominently features in the self-depiction of Fiji as belonging to the SIDS, for which "global temperature changes of 1.5°C above pre-industrial temperatures and beyond would have catastrophic impacts on [...] [their] environment, infrastructure, and livelihoods" (LT-LEDS, 2018, p. 4). It is further demonstrated in Fiji's Climate Change Bill, which is subtitled a declaration of climate emergency and emphasizes that "climate change remains the single greatest threat to the livelihoods, security and wellbeing of the peoples of Fiji [...] [as] Fiji is particularly vulnerable to the climate emergency" (Climate Change Bill 2021, 2021, p. 20). Simultaneously to emphasizing its vulnerability, Fiji highlights its development objectives of "unprecedented growth of [...] [its] economy" (NCCP, 2019, p. 5) and of green growth that "sets out to achieve a four-fold increase in GDP per capita, an annual real GDP growth rate of 4-5%, [and] poverty reduction of 43%" (LT-LEDS, 2018, p. 35). Through this, Fiji demonstrates its need for and priorities of economic development. It also claims its right to economic growth for increasing its prosperity and wellbeing, which is an important aspect in Fiji's strategy to visualize the need, or phrased differently its demand, for international financing.

The limited capabilities of addressing climate change and the priority of economic development are further underlined using the scientific method of modeling different emission scenarios. These scenarios build on different levels of ambition depending on the amount of external finance. One underlying assumption in these emission scenarios is that Fiji will experience economic growth. This is projected to result in increasing emissions due to increased energy consumption if Fiji does not receive sufficient financial assistance to install large amounts of renewable energy capacity. For example, in the BAU Unconditional scenario, Fiji's LT-LEDS states that additional fossil fuel capacity will be installed next to 245 MW of renewables, whereas in the Very High Ambition scenario, no additional fossil fuel but renewable capacity 1943 MW should be deployed. The central message of the

scenario modeling to the international community is the following: without international climate finance, Fiji does not have the capability to reduce its emissions, and emissions will increase over time (BAU Unconditional). With limited financial assistance, only low-cost measures to reduce emissions such as efficiency improvements can be undertaken, which will still result in increasing emissions, albeit at much lower rate (BAU Conditional). With medium levels of international finance, more ambitious measures that are not yet incorporated in Fijian policy can be implemented, and significant emissions reductions but no net-zero emissions can be achieved (High Ambition). And lastly, with high levels of financial assistance, very ambitious measures can be undertaken that result in net-zero emissions by 2045 and thereafter contribute to net-negative emissions (Very High Ambition) (LT-LEDS, 2018).

Therefore, through highlighting its vulnerability to climate change in combination with its limited capacity to implement ambitious emission reductions, and framing national emission reduction scenarios as dependent on international finance, Fiji invokes moral obligations within the international community. The policy documents also state that “Fiji’s national carbon dioxide equivalent emissions make up a statistically insignificant 0.006% of global emissions” (LT-LEDS, 2018, p. 4). This emphasizes that “Fiji’s share of global GHG emissions is negligible compared to the developed and major emerging economies [...] [which makes it] least responsible for the [climate change] problem” (LT-LEDS, 2018, p. 21). Consequently, Fiji engages with the global net-zero norm in order to raise demands to the international community to provide financial assistance as well as technology and capacity building measures. At the same time, Fiji invokes the CBDRC principle to divert the responsibility for reducing its national emissions to the international arena. This demonstrates Fiji’s interest in global norm setting in order to ensure ambitious and effective climate action by other states, which in turn prevents the worst impacts of climate change on the SIDS.

Second, Fiji engages with the global net-zero norm in order to spur increased climate change mitigation action in other parts of the world. It thus aims to influence the behavior of other states through a global emergency framing. Stating that both “Fiji and the Earth are facing a climate emergency” (Climate Change Bill, p. 20), Fiji urges other states to also adopt and strive for net-zero ambitions, and demands a “rapid and ambitious transition towards a [...] net-zero emissions global economy” (Climate Change Bill, p. 87). Thus, Fiji’s “leadership in international climate action” (LT-LEDS, 2018, p. 21) and adoption of the global net-zero norm serves to increase ambition in other states such as developed countries, as the impacts of climate change on Fiji are caused almost exclusively them.

Third, another pathway through which Fiji aims to exert influence on the international community for its own interests presents the issue linking of ocean sustainability to the climate change regime. This is done because the climate regime offers higher institutional as well as financial capacities than the ocean regime. This linking of one issue to another issue area is also referred to as bandwagoning in the international relations literature (Chan, 2021). Academic scholarship has also investigated this issue linking in particular issue areas such as climate change, where the concept of climate change bandwagoning has been described as the

“phenomenon of political actors strategically linking their issues to climate change politics” (Jinnah, 2011, p. 3). Climate change bandwagoning occurs through the discursive reframing of issues to establish connections and especially climate benefits in the linked issue area. Thus, it presents a “strategic linkage that involves the purposeful expansion of regime mission to include new climate-oriented goals that linking agents believe will further their own agendas” (Jinnah, 2011 p. 4). Motivations for climate change bandwagoning include the regime failure in the original issue area, the struggle to increase organizational relevance, to access financial resources or to achieve more equitable and effective policy outcomes (Jinnah, 2011).

In its policy documents, Fiji establishes links between oceans and the climate regime through framing oceans as important for the climate change problem. Specifically, Fiji’s LT-LEDS highlights the negative impacts of climate change on oceans such as ocean acidification and coral bleaching, oxygen depletion leading to ‘dead zones’ and marine biodiversity loss. But the LT-LEDS also frames ocean sustainability as a solution strategy for addressing climate change by stating that “healthy oceans are necessary to delivering a healthy climate” (LT-LEDS, 2018, p. 66). Constructing ocean sustainability as essential for mitigating climate change as well as for adaptation, for example through the potential of ‘blue carbon’ stored in mangroves or sea grass beds, is an important and increasingly employed strategy by entrepreneurial states and NGOs to link ocean and climate change governance (Chan, 2021).

Fiji indeed highlights the potential of its oceans as carbon sinks and underlines its innovative leadership in this sector as it is “among the first long term emission reduction strategies in the world to address the Blue Carbon Sector” (LT-LEDS, 2018, p. 4). Most important in Fiji’s blue carbon potential are its mangrove ecosystems. However, the BAU scenarios presented in the LT-LEDS do not incorporate policies that reduce the deforestation and thereby support the carbon storage by mangroves in the long term. Instead, in the High Ambition scenario, “a fully enforced moratorium is assumed to take effect” (LT-LEDS, 2018, p. 151) under the assumed condition that additional “financing to support the development mangroves maps and nurseries for replanting” (LT-LEDS, 2018, p. 151) is provided. The Very High Ambition scenario, which assumes even higher levels of international finance, incorporates the same measures and besides that sets out large scale replanting of mangrove forests. Therefore, Fiji’s issue linking of oceans and blue carbon appears to arise from the motivation of accessing the financial resources of the climate regime, as also mentioned in its engagement with the Green Climate Fund. This is something observed more often in the issue linking of ocean sustainability and climate change, as blue carbon-rich states aim to acquire institutional recognition for accessing future international support (Chan, 2021).

In addition to this resource motivation for climate change bandwagoning, Fiji also pursues the objectives of harnessing the institutional framework of the climate regime. The prospect of this is to spur more effective governance for addressing issues of ocean sustainability relating to international maritime transport. The regime surrounding environmental problems arising from international shipping is rather fragmented and

regionalized (van Leeuwen, 2015). As exemplified in Sweden’s localization of the net-zero norm, states do not assume responsibility for the emissions embedded in international shipping. So, in contrast to the dominant territorial assumptions for allocating emissions at the foundation of the UNFCCC process, for example, there is no consensus for allocating the emissions resulting from international maritime transport. Consequently, diverging norms concerning responsibility exist (Chan, 2021). With its ambition of assuming “[i]nternational leadership on climate change and shipping” and to “become the primary low carbon maritime hub for the Pacific region” (LT-LEDS, 2018, p. 107), Fiji could potentially shape the design of governance mechanisms and institutions. And with the forecast that “significant carbon penalties (taxes, levies, etc.) will [very likely] be levelled across the global maritime industry in the next 5-10 years” (LT-LEDS, 2018, p. 107), Fiji seems to favor certain approaches over others.

To summarize, Fiji’s norm localization demonstrates efforts to shape and influence the global climate regime. Fiji finds itself confronted with the negative impacts of climate change, which is almost exclusively caused by other countries than Fiji. Consequently, Fiji needs to find viable strategies to steer those states responsible for climate change for ambitious and effective mitigation action, which Fiji does by engaging with the global net-zero norm. Through constructing its own achievement of net-zero emissions conditional upon high levels of external funding and emphasizing the need of global net-zero for preventing the climate emergency, Fiji captures the norm for leveraging increased ambition in the rest of the world.

6. Discussion

Based on the recent wave of net-zero pledges internationally, which appears to indicate increased ambition for climate change mitigation, this research set out to investigate the nature of these pledges in more detail with the broader aim of evaluating whether this contributes to more effective climate governance. The international definition of what net-zero entails, however, remains vague, which gives rise to potential transparency and resulting accountability challenges. Therefore, the concrete objectives of this research were to trace the origin and evolution of the norm along its life cycle and the eventual national localization of the global net-zero norm through the interpretation and implementation by early norm adopting states.

The tracing of the evolution of the net-zero norm in the early stages of its life cycle demonstrated the emergence of the norm in science and the norm advocacy of the IPCC. This was followed by the uptake at the international political level in the Paris Agreement. The analysis shows that the initial meaning of the net-zero norm was defined at the global level, based on the modeling of global emission scenarios and climate system responses with associated mean global temperature increases. Furthermore, the net-zero norm was modeled to require implementation by 2100 in order to limit global warming to 2°C. Here, the Paris Agreement presents a divergence, defining net-zero ambitions to be reached in the timeframe of mid of the century. Besides this, the meaning did not change much in the uptake at the political level compared to its origin in science.

The explorative investigation of the localization of the global net-zero norm, meaning the national interpretation and implementation including norms and ideas in this process, was analyzed using three case studies of early norm takers. These norm taker states are 1) Sweden as a representative example of wealthy industrialized countries and simultaneously the first adopter of the net-zero norm globally, 2) China as an early adopter of the net-zero norm in the group of rapidly emerging economies that are in the transition between developing and developed countries, and 3) Fiji as an early norm taker among the Small Island Developing States that face the double burden of being a developing country and experiencing among the most severe impacts of climate change. The similarities and differences in norm interpretation between the three norm-taking states are summarized for comparison in Table 5. The overall picture emerging from the comparative analysis is that whereas the norm adaptations of the three states appear to be rather similar at first due to the language used, upon closer investigation considerable variation can be observed. No common ground or core of the norm can be found across all three states besides the scope of emissions covered, which corresponds to national and production-based emissions excluding international shipping and aviation. Consequently, differences in the norm localization exist on the dimensions of terminology, target specification, coverage of emissions, time frames and interim targets. The starkest differences between norm localizations are discernable between Sweden's and China's norm interpretation. Fiji's norm interpretation shares more similarities with China's

adaptation but overall remains vague and ambiguous, making it difficult to compare with confidence. At the same time, this ambiguity decreases transparency in the norm adaptation and thereby introduces accountability issues. The relevance of these two concepts in climate governance is laid out in the following section, before transparency and accountability aspects in the norm localizations are assessed.

Table 5. Comparative overview of norm localizations by Sweden, China and Fiji.

Norm taker	Terminology	Target specification	Emission covered	Scope of emissions	Time frame	Interim targets
Sweden	Net-zero emissions of GHGs	ER of at least 85% compared to 1990, CDR measures contribute max. 15%	GHG emissions	Territorial emissions, excluding emissions from international shipping and aviation	Achieving net-zero emissions by 2045 (thereafter net-negative emissions)	<ul style="list-style-type: none"> • By 2030, reduce emissions from domestic transport (excluding domestic aviation) by a minimum of 70% compared to 2010 • By 2030, reduce emissions by a minimum of 63% compared to 1990 and increase this reduction to a minimum of 75% by 2040
China	Carbon neutrality	No specification for ER and CDR targets	CO ₂ emissions	No specification, but assumed to cover territorial emissions excluding emissions from international shipping and aviation	Achieving carbon neutrality by 2060	<ul style="list-style-type: none"> • Carbon peaking before 2030 • 65% reduction of CO₂ emissions per unit of GDP by 2030, compared to 2005 levels • Increase the share of non-fossil fuels in total energy consumption to 20% and in primary energy consumption to 25% by 2030 • Increase the forest stock volume by 6 billion cubic meters from the 2005 levels • Bring totally installed solar and wind capacity to over 1.2 billion kilowatts
Fiji	Net-zero GHG emissions, net-zero carbon emissions, carbon neutrality	No specification for ER and CDR targets	CO ₂ emissions, GHG emissions (CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ , NF ₃)	Territorial emissions, excluding emissions from international shipping and aviation	Achieving net-zero emissions by 2050	<ul style="list-style-type: none"> • To derive 100% of national electricity production from renewable energy sources by 2030, which, combined with economy-wide efficiency measures will reduce overall emissions by 30% - but only 10% to be achieved through national policy, the rest conditional on external funding • To decarbonize the transport sector • To preserve and enhance natural carbon sinks

6.1 Contrasting norm localizations: transparency and accountability

The underlying motivation for this research was to assess transparency and accountability aspects in light of the vagueness and ambiguity surrounding the net-zero pledges by states. Transparency is theorized to contribute to greater levels of accountability for action and inaction, which in turn is thought to lead to improved sustainability outcomes (Gupta et al., 2020; Gupta & Mason, 2016). However, scholarship assessing the assumption that increased transparency will result in improved accountability outcomes for climate mitigation action, finds that this relationship is less simple and direct than assumed in theory (Gupta et al., 2020; Gupta & Mason, 2016; Gupta & van Asselt, 2019; Mason, 2019). Consequently, this requires questioning the ‘transformative promise’ of transparency arrangements in global climate governance for improving accountability and consequently increasing ambition and effectiveness (Gupta & van Asselt, 2019). However, the objective of this thesis is not to empirically analyze the causal relationship. Rather than assessing the performative effects of transparency, this research presents an explorative investigation of the localization of the global net-zero norm by nation-states. It thus aims to identify potential transparency and accountability issues embedded therein.

For this undertaking, this thesis builds on the premise that whereas the causal impact of transparency for fostering accountability is not unequivocal, accountability issues will arise in the absence of transparency. To identify critical transparency and relating accountability aspects in the net-zero norm localizations and simultaneously contrast norm interpretations (see also Table 4), the analytical framework developed by Gupta and van Asselt (2019) is used. This framework disaggregates accountability along the answerability and enforceability dimensions into five core elements. On the answerability dimension, the components present the relations between ‘accountor’ and ‘account-holder’, the standards of performance defining the subject of accountability, and the judgment processes to assess if the standards are being met or not. On the enforceability dimension, the components consist of sanctions to penalize non-compliance with the standards as well as regress, which refers to the scope and modalities of liability and compensation for negative impacts resulting from non-compliance with the standards (Gupta & van Asselt, 2019). For operationalizing the linkages between transparency and accountability, in turn, the authors theorize that for each accountability component to realize, transparency about these components is required. This results in the parallel transparency components of relations, standards, judgments, sanctions and redress (Gupta & van Asselt, 2019).

Resulting from the nature of most international norms that are not institutionalized in monitoring and enforcement mechanisms but function as (moral) standards of appropriate behavior (Finnemore & Sikkink, 1998), state-to-state accountability on the enforceability dimension is rarely realized. Characteristic of the climate regime, the enforceability dimension in form of sanctions or liability is either largely missing or only vaguely implied in the governance arrangements such as the UNFCCC or the Paris Agreement (Gupta & van Asselt, 2019). Consequently, enforceability of the net-zero norm or rather the national implementations thereof are not provided. This is why this thesis focuses on assessing

transparency provisions for accountability on the answerability dimension, including the components of relations, standards and judgment.

The component of relations, which concerns who is to be transparent to whom and thus to be held accountable, is in all three instances of norm localization designed as state-to-state accountability. Through communicating the net-zero ambitions in their long-term emission development strategies submitted under the provisions of the Paris Agreement, the three states transparently establish their accountability in the relations to the fellow signatory parties. Transparency challenges arising from the general governance arrangements of the institutions of the climate regime are, however, that signatory parties are urged but not through enforceable means required to publish such long-term strategies (Gupta & van Asselt, 2019). Thus, continued transparency is not guaranteed, and neither is the connected possibility of holding states internationally accountable.

In addition to the mutual accountability (Karlsson-Vinkhuyzen et al., 2017) achieved through the international state-to-state relations, the Swedish localization also defines domestic relations of transparency and accountability. The Swedish government is obliged to report to both the parliament and the independent Climate Policy Council about the emission reduction achievements of existing climate policy and about climate policy planned for the future (Climate Policy Framework). Through this, domestic relations for answerability are established. This, in combination with the pathway of mutual accountability at the international level, could present more effective leverage to ensure accountable state behavior than individual pathways (Karlsson-Vinkhuyzen et al., 2017). As transparency in the Swedish norm localization is provided both in international and domestic relations, accountability of the Swedish state for realizing the net-zero norm might be higher than in China or Fiji.

With regards to the transparency about standards and relating judgment of performance to assess if these standards are being met, more pronounced differences exist. Sweden demonstrates an overall high level of transparency about the standards it can be held accountable to, with a small but striking exception relating to the definition of the net-zero norm. The terminology used refers to net-zero emissions of GHGs in general, and while a broad coverage of climate change driving emissions is adequate, Sweden does not communicate which concrete GHG emissions this includes. But besides that, Sweden's norm localization exhibits high levels of transparency. On the one hand, this is shown in the target specification of net-zero emissions into quantitative contributions of ER versus CDR and offset measures. This allows for close monitoring and judgment of performance, as Sweden foregoes the opportunity of relying on large contributions through offsets in case emission reductions are not sufficient for achieving the net-zero ambition. On the other hand, the quantitative interim targets for 2030 and 2040 enable quantitative evaluation of Sweden's progress towards achieving the set goals, and therefore allow timely judgment if the standards are being met.

Moreover, Sweden establishes transparent judgment processes through the creation of an independent expert body tasked with the evaluation of government climate policy. This Climate Policy Council assesses the government's current and planned climate policy against

their success of reducing emissions and their compatibility with the long-term Climate Goals. Through their annual reports, the council publishes their evaluation of the government's policy and thus holds the government publicly accountable through the means of knowledge generation and dissemination. Due to the public perception of the Climate Policy Council as indeed independent from the government and as important actor for scrutinizing climate policy, it receives broad media coverage and facilitates public demand for more ambitious policy (K. Eckerberg, personal communication, January 17, 2022). In addition to the judgment process of domestic institutions, this potentially contributes to another pathway of holding the government accountable through (national) publics (Karlsson-Vinkhuyzen et al., 2017). However, the body does not hold enforcing power and is thus unable to sanction the government for not implementing its recommendations or for not improving policy sufficiently. Therefore, accountability is still limited to the answerability dimension.

China's norm localization contrasts with that of Sweden. China's interim targets are transparent in a sense that they are communicated to the international community, but the standards are not constructed in a way that creates accountability for absolute emission reductions. On the one hand, the qualitative goal of reaching peaking CO₂ emissions before 2030 does not present a transparent standard against which China's performance can be evaluated, as it implies no absolute emission reductions before 2030. It merely means a slowed down but continued emissions growth, for which it can only be retrospectively evaluated whether it has reached a peak or not. Consequently, other states face difficulties in holding China accountable against this standard. On the other hand, China's additional quantitative interim targets also diffuse accountability for reducing absolute emissions, as these standards are constructed as only indirectly relating to emission reductions. The interim targets of a 65% reduction of carbon intensity per capita involves similar transparency issues about the implications on overall emissions, as this standard is constructed in relation to GDP. As China's policies envision continued economic growth, this standard will not contribute to overall emission reductions, but merely to emissions growing at a slower rate than GDP. Likewise, the remaining interim targets of increasing the share of renewables in energy consumption, the installed capacity of renewables and the forest stock volume present no direct and absolute emission reduction targets. Rather, the achievement of these targets indirectly relates to relative emission reductions. Although these quantitative targets as such are transparent, they are not transparent about China's planned total emission reductions. Consequently, this lack of transparency about the standards needed for effectively addressing the problem of climate change create accountability issues for the international community to hold China accountable for reducing its emissions.

Fiji's norm localization also demonstrates lower levels of transparency, as the precise operationalization of the net-zero norm remains ambiguous and thereby obscures the standards to which Fiji makes itself accountable. This results mostly from the ambiguous use of terminology referring to net-zero emissions of GHGs and carbon neutrality rather interchangeably. Additionally, the presentation of the four ambition scenarios in the LEDS further diffuses transparency about the policy scenario Fiji will follow in practice and the

relating standards it can thus be held accountable to. And moreover, similar to the transparency caveats arising from the norm localization by China, Fiji's interim targets are construed either as standards that only indirectly contribute to overall emission reductions or as qualitative targets. The first is demonstrated in the interim target of deriving 100% of national electricity from renewable energy sources. The latter surfaces in the targets of decarbonizing the transport sector as well as preserving and enhancing natural carbon sinks. As in the case with the accountability issues in China's norm localization, these kinds of standards do not provide transparency about effective measures to reduce absolute emissions, thus creating challenges of holding Fiji accountable to this.

This short analysis demonstrates that transparency issues exist in the norm localization of the global net-zero norm, with Sweden most likely presenting an exception rather than the standard. These transparency issues, which arise from qualitatively or indirectly constructed targets for emission reductions, lead to challenges for the international community including both states and other interest groups to hold countries like China and Fiji accountable. Not only does this make evaluating the feasibility of states' pledges challenging. But the lack of accountability also reflects the greater struggles surrounding the question of responsibility for addressing the global problem of climate change through mitigation efforts. Unclear targets such as in China's and Fiji's operationalization diffuse responsibility in two ways: by obscuring the degree of responsibility states actually do assume, and by subsequently overshadowing questions of how much responsibility individuals should assume.

To address these issues, Rogelj et al. (2021) propose that distinct targets for direct emission reduction, emission removals and offsets should be set by states, similarly to how Sweden operationalizes its net-zero ambition. Additionally, fairness and equity in the construction of global net-zero pledges must be discussed at the international level, as not all states have the same capabilities and historical responsibilities of reaching net-zero emission by 2050. This also relates to the role of offsets for achieving net-zero pledges, as states buying offsets shift the burden of emission reductions to other states without undertaking much action themselves. Increasingly relying on offsets becomes unrealistic and also unfair to those states providing these offsets but cannot count them towards their own mitigation targets (Rogelj et al., 2021). Therefore, transparency in states' pledges and plans for net-zero is crucial for enabling global discussions of what is equitable and fair and also in line with the collective target of achieving net-zero emissions at the global level (Rogelj et al., 2021).

6.2 The IPCC: a 'moral' norm entrepreneur?

This thesis used a constructivist perspective and a theoretical framework building on norm theory in international relations to investigate the recent phenomenon of a wave of net-zero pledges by states. These net-zero pledges appear as a fundamental shift in the climate regime that for a long time was regarded as 'doomed' due to inherent cooperation problems (Battersby, 2017; Carattini et al., 2019). Constructivist norm theory was chosen, because it enables to theoretically conceptualize the concept of net-zero emissions, which is not formally institutionalized in the governance arrangements of the global climate regime. And yet, the

net-zero concept presents the essential goal that the Paris Agreement sets out to achieve through appealing to states' ambitions. Therefore, as of now, the goal of net-zero emissions can be understood as functioning at the level of the "collective expectations for the proper behavior of actors" (Katzenstein, 1996, p. 5) and setting the standards for what is appropriate behavior of states (Finnemore & Sikkink, 1998) with regards to climate change.

Tracing the evolution and subsequent uptake of the net-zero norm using the theory of the norm life cycle (Finnemore & Sikkink, 1998) proves useful for identifying the IPCC as a norm entrepreneur in the climate regime. Whereas Finnemore & Sikkink (1998) define norm entrepreneurs to be transnational advocacy networks with moral and normative motivations, Zwolski & Kaunert (2011) extend the scope of norm entrepreneurs to epistemic communities. Although the IPCC exhibits features of the 'classical' norm entrepreneur such as its issue reframing due to inadequate problem-solving in Finnemore's & Sikkink's (1998) sense, the specification of epistemic communities as norm entrepreneurs provides additional insights into the means of norm advocacy. In Haas' definition of the concept, epistemic communities are "network[s] of professionals with recognised expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge" (Haas, 1992, p. 3). Acting as norm entrepreneurs, epistemic communities build on ideational factors arising from common causal and principled beliefs (Haas, 1992; Zwolski & Kaunert, 2011).

The IPCC, which constitutes such an epistemic community based on the common belief of anthropogenic climate change, embodies a unique representation of climate science in international politics. The ideational factors of the IPCC constitute the synthesized knowledge about the state of the art of climate science that is presented on the major organizational platform of its assessment reports (Interviewee, personal communication, December 16, 2021), through which the IPCC influences the climate regime as demonstrated in the emergence of the net-zero norm. Besides this, Schleussner et al. (2016) find that the IPCC has also shaped the issue conceptualization of climate change to not exceed 2°C warming. The authors link the gradual adoption of specific temperature limits at the political level to the evolution of scientific knowledge on the impacts and risks of climate change (Schleussner et al., 2016). This shows how scientific expertise lends moral authority to the IPCC. To further advance the theory on norm life cycles and the concept of norm entrepreneurs, such typologies of norm entrepreneurs could thus prove useful for distinguishing the means and pathways through which different actors advocate for and drive the uptake of new norms.

However, despite the influence of the IPCC on global and national politics to induce climate governance that recognizes and addresses the issue of climate change, the moral character of this norm entrepreneur is not left unquestioned. For example, one strand of criticism focuses on the production of global knowledge that is essential for framing climate change as a global problem that requires global cooperation but that is decontextualized from the local and regional level. Focusing on the single indicator of global average temperature functioning as an index of the climate change problem bears the risk of detaching knowledge from being meaningful. This is because concrete local and regional impacts, which might be

more relevant for mobilizing society, are overshadowed (Turnhout et al., 2016). Furthermore, this abstract indicator of global temperature arising from quantitative modeling of emissions and temperature responses of the climate system creates the idea that the global temperature can and should be controlled (Turnhout et al., 2016). This idea is also reflected in the presentation of the net-zero norm, which ultimately constitutes a quantitative modeling exercise that balances emissions to the atmosphere with the uptake of emissions from the atmosphere.

A second strand of criticism concerns the self-imposed mandate of the IPCC to be policy-relevant but not policy prescriptive. According to critics, this is not possible and bears the pitfalls of obscuring how this knowledge is performative and creates reality (Interviewee, personal communication, December 16, 2021). On the one hand, the knowledge production of the IPCC is policy prescriptive, as it is partly co-produced by the IPCC scientists and policymakers. For example, the synthesis of the knowledge for limiting global warming to 1.5°C instead of 2°C that was presented in the IPCC's Special Report on Global Warming of 1.5°C had political rather than scientific origin. Upon political request, the IPCC set out to investigate what it would take to achieve 1.5°C warming, whereas before that, scientists in the IPCC did not deem the scientific basis sound enough for assessing the different impacts between and pathways for 1.5°C and 2°C (Interviewee, personal communication, December 16, 2021). On the other hand, the knowledge production is also inherently prescriptive through the way the IPCC chooses to predict and present certain pathways for limiting global warming to 1.5°C and 2°C. As the pathways and scenarios, which are mainly constructed using integrated assessment models that include certain aspects and necessarily exclude others, they create an imaginary of how climate change can and should be addressed that then becomes reality but that also forego alternatives. For instance, this is demonstrated in the inception of CCS technologies, which the IPCC has made exist through the inclusion in its modeling (Interviewee, personal communication, December 16, 2021). Therefore, critics highlight that the knowledge presented by the IPCC is considered as truths (Interviewee, personal communication, December 16, 2021). This truth regime that is characterized by quantitative knowledge and modeling shapes the idea that temperature and climate change can be controlled by reducing emissions to net-zero. It also shapes the notion that humanity could easily reverse the history of anthropogenic climate change (Interviewee, personal communication, December 16, 2021; Turnhout et al., 2016).

Consequently, recognizing the IPCC as an epistemic norm entrepreneur in the climate regime that shapes the issue conceptualization of climate change and is not only policy-relevant but also policy prescriptive would be more truthful (Interviewee, personal communication, December 16, 2021) than continuing to view knowledge as neutral input for policymaking (Turnhout et al., 2016). Ultimately, as “being policy-relevant is to be policy prescriptive” (Turnhout et al., 2016, p. 70), extending the concept of norm entrepreneurs to epistemic norm entrepreneurs helps to highlight that a separation of objective and truthful knowledge from politics is impossible. Viewing scientific bodies tasked with generating and synthesizing knowledge on a specific issue area as neutral and separate from the governance

of these issues thus obscures their performative influence. As “how one knows constraints how one governs and how one governs shapes what one needs to know” (Turnhout et al., 2016, p. 69), one should know that scientific knowledge production is itself political and in turn shapes politics. Ignoring the political implications of the quantitative modeling exercise of the net-zero emissions concept to stay policy-neutral might work on paper, but the implementation of this concept advocated for by the IPCC is indeed inherently political.

6.3 Evaluating norm localizations: motivations of self-interest

For analyzing and comparing the differences in norm interpretation and implementation between the three states of Sweden, China and Fiji, the theory of norm localization as developed by Acharya (2004) was chosen. The theory of norm localization moves beyond the dichotomy of acceptance versus resistance for explaining norm diffusion processes that is based only on the normative fit between existing local norms and new global norms. Although norm congruence is not irrelevant, norm localization theory highlights the process of building congruence through framing and grafting, and constitutes thus a dynamic rather than an existential explanation of norm diffusion (Acharya, 2004). The theory postulates that localization, meaning the reconstruction of foreign norms by local agents, rather than wholesale rejection or acceptance will occur in most cases of global norm diffusion. According to the theory, localization is expressed in the changes and variations it produces in the goals and institutional arrangements in the local setting of the respective 'norm taker' (Acharya, 2004).

As observable in the chapters on the three 'norm takers' being Sweden, China and Fiji, the interpretations and implementations of the global net-zero norm at the respective national level do not present exact copies of the global net-zero norm as stated in the Paris Agreement. Neither are the three norm adaptations the exact same at the national levels. Rather, as the discussion and comparison of the norm interpretations (see table 4) has shown, norm adaptations differ in the most points analyzed, with the only conformity being the national scope of emissions falling under the ambition to reach net-zero, and the involved lack of responsibility for international emissions resulting from global trade and transport. The observed variations in the goals, such as the divergent coverage of climate change inducing emissions and timeframes as well as target specification into ER and CDR goals, and the different apparatuses that institutionalize the norm, such as the anchoring in hard law or policy as well as the establishment of reporting obligations and independent bodies to evaluate climate policy, demonstrate that indeed localization shapes the diffusion of the net-zero norm. In light of the large number of states that have adopted net-zero targets, which at the time of writing are 83 countries that cover 74% of global GHG emissions (World Resources Institute, 2021), norm localization appears to better explain the norm cascade, rather than wholesale acceptance. As pledges of reducing emissions to net-zero imply dramatically increased ambition on behalf of states that is in contrast with the rather low ambitions to reduce emissions that have characterized the climate regime for long times (Battersby, 2017; Carattini et al., 2019), such an outright shift to significantly increased ambition and hence a wholesale adoption of the net-zero norm seems unlikely.

Furthermore, the theory of norm localization, specifically the matchmaking processes of framing and grafting of the norm takers, prove useful for identifying the norms and ideas that shape norm adaptation. Whereas at first the norm adoption of the net-zero norm appears to be motivated by concerns for mitigating climate change and its negative impacts, investigating how the respective norm taker frames norm adoption highlights how the norm is made fit with already existing ideas. Sweden frames the net-zero norm in line with its past achievements of reducing emissions to advance its self-image of a cosmopolitan leader for sustainable development. This includes setting high standards internationally as well as nationally, which can be explained by Sweden's self-perception of 'already being halfway there' due to its large renewable assets and its forest resources that Sweden frames as contributing to net-zero emissions in the envisioned bioeconomy. In combination with its governance approach of primarily economic incentive-based mechanisms, this highlights that Sweden shapes the net-zero norm for sustainable growth and profit, aiming to induce innovation due to the economic self-interest of Swedish businesses being leading in technology development. China constructs the norm to be compatible with its existing normative position of continuing economic growth for sustainable development. This includes framing fossil fuel-based energy sources such as coal and gas as sustainable to not severely restrict national energy production and guarantee unhampered economic growth. Additionally, China associates the net-zero norm with the norm of CBDRC for addressing climate change between developing and developed countries. This process of grafting serves the ambition of China to position itself as a still developing country in the climate regime in order to avoid demands from the international community for increased responsibility of reducing emissions. And Fiji highlights its high vulnerability and simultaneously low capacity to address climate change due to its nature of a SIDS state and therefore frames the achievement of its net-zero ambition as conditional upon high levels of international climate finance by also highlighting the CBDRC principle. By framing ocean sustainability as an important solution strategy for mitigating climate change, Fiji engages in climate change bandwagoning and uses the net-zero norm for issue linking.

However, the motivations of norm takers for norm adaptation appear to follow a different directionality than theorized norm localization, which emphasizes motives of strengthening existing domestic norms and institutions and fostering domestic legitimacy of the authority of norm takers (Acharya, 2004). Whereas the framing and grafting of the net-zero norm by the three norm-taking states exhibit motivations of strengthening their existing cognitive priors and underlying rationales, these motivations seem to seek exercising influence on the international regime more than at the domestic level. As presented above, all three states employ the net-zero norm to establish and occupy certain positions in the climate regime, from ambitious leader to indigent developing country depending on international support. Consequently, norm localization also works for pursuing and advancing national self-interests at the international level and to shape the global regime as well as involved notions about responsibility according to national norms.

If the adaptation of global and ‘moral’ norms by states reflects national self-interests and the reconstruction of global norms in accordance to those, how does this relate to their potential for creating political change (Finnemore & Sikkink, 1998), and even political change for the moral good (Lawless et al., 2020)? Or more specifically in the context of environmental governance and climate change, do global norms present a vital focal point for improving sustainability outcomes? One could argue that in a global political system where the distribution of (military) power decreases in its influence for shaping states' behavior – as norm scholarship frequently does – that norms do matter (Björkdahl, 2002; Finnemore & Sikkink, 1998). In light of the absence of binding emission reduction obligations at the international level and related enforcement mechanisms, the soft power of ideas, norms and values could present important motivators for state action (Björkdahl, 2002). Consequently, the pledged ambitions of states to achieve net-zero emissions could be seen as a step in the right direction, with vague targets and implementation plans (Fuglestedt et al., 2018; Rogelj et al., 2021) being better than none. In this sense, one could argue that the net-zero norm is at least effective for creating outputs (Young, 2011) in the form of Climate Change Acts with a hard law character or long-term policy plans.

Critics doubt that this conceptualization of effectiveness in forms of rather low ambition is reason enough for concluding that also more ambitious conceptualizations of effectiveness, such as performance (Young, 2011) of reducing global emissions, will follow in practice. Rogelj et al. (2021) argue that the risk of relying on these net-zero pledges is too high, and that more clarity about the strategies to implement these targets is needed to retrace them and evaluate effectiveness. In such a critical view, the net-zero norm does not (yet) prove effective for inducing actual change and a transition into a future of successfully limiting climate change. However, the authors consider the review process of the United Nations as a promising starting point for creating concrete roadmaps as well as assessing and arising states' NDCs (Rogelj et al., 2021). This implicitly points to the importance of formal and prescriptive drivers (Lawless et al., 2020) such as institutional arrangements for creating transparency and sanctioning weal or non-compliance with the norm, in order to complement the discursive and intangible drivers of norms.

7. Conclusion and recommendations

This thesis aimed to assess the potential of the global net-zero norm for effective climate governance. By tracing the life cycle of the net-zero emissions norm and the evolution of its meaning, the research set out to also identify transparency and accountability challenges in the norm uptake by three states. The theoretical perspective adopted in this research is a critical constructivist perspective combined with norm theory. Specifically, the theoretical framework draws on Finnemore & Sikkink's (1998) foundational theory of norm life cycles for explaining norm diffusion, and on Acharya's (2004) theory on norm localization for explaining national adaptation of global norms. Together, the overarching research goal and the theoretical framework chosen led to the following three research questions: 1) What is the evolution of the net-zero norm and its meaning from its origins in science to its uptake in international climate governance? 2) How do norm entrepreneur states interpret the net-zero norm? and 3) How do norm entrepreneur states adapt the net-zero norm and implement it into practice?

To answer these questions, qualitative research in form of discourse analysis was performed in order to explore the meaning and contribute to a greater understanding of the net-zero norm in the various stages of its life cycle. For the first research question, the analysis focused on the Summary for Policymakers of the IPCC's Fifth Assessment Report (2014), which first presented the net-zero emissions concept to the international community. Additionally, a semi-structured interview with an academic expert on the IPCC was conducted. This served the purpose of gaining an advanced understanding of the internal processes of knowledge production within the IPCC and its engagement with the broader climate regime. Another aim was to distill the meaning of the net-zero norm at the international level in the stage before the norm cascade, in which many states implement the norm. For this, the definition of the norm in the Paris Agreement (2015), which serves as the main institution enshrining the norm at the international political level, was analyzed. This sequential analysis reflects the chronological process of the emergence of the net-zero norm, with its origins in the natural sciences of quantitative modeling and the subsequent uptake in the international climate regime. The analysis shows that the meaning of the net-zero norm did not change significantly in these early stages of the norm life cycle. Similarities between the initial meaning as established by the IPCC and the meaning assumed in the Paris Agreement present the definition of net-zero at the global level, as well as the scope of emissions to cover all GHGs. Differences exist with regards to the timeframe and the interim targets. Whereas the IPCC initially sets the timeframe for reaching global net-zero to roughly 2100, the Paris Agreement adopts the vague timeframe of achieving global net-zero in the second half of the century.

To answer the second and third research question, the discourse analysis focused on analyzing legislative and policy documents that evidence the engagement with the net-zero norm by three 'norm taker' states, which are defined as early adopters within their group of

similar states. Sweden, China and Fiji were identified to be norm takers and representatives of western industrialized states, rapidly emerging economies and Small Island Developing States, respectively. The analysis finds that processes of norm localization produce variations in both the interpreted meaning and policy implementation of the net-zero norm between these three states. Interpretation of the rather vaguely defined global norm results in diverging terminology used to define the scope of emissions covered as well as different timeframes and interim targets. Comparing interpretations also highlights caveats in the international definition: the lack of governance mechanisms and universal standards requiring states to publish separate targets for the contributions of ER versus CDR and offsets creates leeway for overly relying on the latter. Especially in the hypothetical but not unrealistic case of emission rates being far from net-zero when approaching the set timeframes, large-scale offsets might be a welcomed last resort for states to reach their targets. Whereas this could present a rational and effective solution in individual instances, the lack of such a distinction bears the danger that relying on CDR and offsets becomes a general approach employed by many states.

Besides these differences in the formal operationalization of the net-zero norm in the national contexts, the analysis also identified several challenges for transparency and accountability. This requires critically questioning the potential of the net-zero norm to result in ambitious climate action. All three states implement the net-zero norm in international relations of transparency, and thus also establish relations of accountability that correspond to the arrangements of the global climate regime. However, these arrangements themselves present internal flaws. Today, research questions if not doubts that these global arrangements can realize increased accountability through the transparency provisions of, for example, the 'pledge-and-review' approach of the 'enhanced transparency framework' created by the Paris Agreement. Whereas the underpinning rationale is that accountability and that trust can be increased by making visible what and how much states are doing, research finds several issues with that. For example, Gupta & van Asselt (2019) highlight that practices of climate transparency do not reduce broader accountability conflicts. Rather, they are reflective of those due to persisting divides over responsibility and burden-sharing for climate mitigation. Weikmans, van Asselt and Roberts (2019) identify several challenges with regards to the information needed to assess the adequacy of action, which render the information reported incomplete and heterogeneous rather than comparable and complete. This interferes with the ability to hold states accountable.

Therefore, arrangements for governing climate ambitions by states should establish mechanisms to address both these inherent challenges and the problems identified in this research. These problems pertain mostly to transparency issues arising from qualitative and indirectly constructed targets for emission reductions, which subsequently impede accountability in international state-to-state relations. Thus, this thesis recommends that mechanisms to improve transparency for increasing accountability in the global climate regime should establish more precise transparency standards. This would enable subsequent judgment and evaluation of states' progress towards these criteria of performance, and

consequently facilitate holding states accountable. Most importantly, these standards should present quantitative targets describing direct emission reduction goals, rather than relying only on indirect and uncertain measures to reduce emissions such as new installations of renewable energy. Additionally, a target specification into ER versus CDR and offsets as well as their relative contribution to achieving net-zero emissions should be made obligatory. This would increase transparency on the role of CDR and offset measures in states' policies and plans, and allow for assessing potential issues therein (Rogelj et al., 2021).

Next to the provision of accurate and comparable information for transparency, another important element concerns the actual use of this information for increasing ambition (Weikmans et al., 2019). In the global climate regime, information revealing non-compliance does not bear the consequences of hard sanctions but only 'naming and shaming' implications due to the absence of a world government with enforcement power (Widerberg & Pattberg, 2017). Hence, this issue of enforceability for accountability also applies to the net-zero norm when established on state-to-state relations of transparency and accountability. Potential solutions to these challenges at the international level can be found at the national level. The implementation of the net-zero norm into hard law such as Climate Change Acts enables the sanctioning of non-compliance by national institutions (Widerberg & Pattberg, 2017). Sweden and Fiji do indeed anchor the net-zero norm in national Climate Change Acts, which offers the potential of sanctioning the government for insufficient policy through national courts. An example of this sanctioning through national institutions can be found in the Dutch *Urgenda v. the Netherlands* case tried in 2015. The courts ruled in favor of the plaintiffs demanding that the Dutch state must reduce its emissions by at least 25% to 40% by 2020 compared to 1990 levels. This court case presents the first instance of a national court ruling based on the international CBDR(C) principle (Barritt, 2021; Ferreira, 2016). Another example that directly relates to the national implementation of the net-zero norm presents the trial in Germany in 2021. The German courts ruled that the German government must implement policy to reach net-zero emissions five years earlier than the envisioned target for 2050 enshrined in the Climate Change Act. This decision was based on the principle of intergenerational equity. It also includes raising interim targets for 2030 from 55% to 65% emission reduction compared to 1990 levels (Order of the First Senate of 24 March 2021, 2021). However, these court cases require plaintiffs to take proceedings against the respective national states and courts indeed ruling in favor of the plaintiffs. Therefore, next to the institutionalization into national law to sanction governments with hard power, establishing independent expert bodies to assess national climate policy could present another recommendable effort. The Climate Policy Council that was created to evaluate the Swedish government's climate policy is an example of sanctioning the government for insufficient climate policy with the means of soft power. Based on the independent expert assessment and implied 'naming and shaming', this can also result in increased public demand for ambitious climate action and pressure on the national government.

Through the application of norm theory, the research also aimed to contribute to a greater understanding of the wave of net-zero pledges by a plethora of states. This

phenomenon might seem like a shift to more ambitious and effective climate governance at first. But it requires more detailed investigation due to the lack of mechanisms governing this norm, which gives leeway for interpretation and dilution of the concept. Applying the theory of norm localization has shown that such interpretation indeed occurs. Furthermore, it demonstrates that norms for environmental governance can have largely diverging meanings in different contexts, despite drawing on the same global norm. By focusing on the practices of framing and grafting, this theory has enabled a deeper understanding of the national interpretations of the net-zero norm through identifying preexisting norms and ideas influencing norm localization. This research focus also allowed for highlighting factors shaping norm adaptation besides the theorized domestic motivations. Such additional factors influencing norm localization identified in this research are motivations to shape the global climate regime and its governance arrangements for national self-interest.

Critical constructivist perspectives might argue, however, that variation is not only the product of localization, but that a universal understanding of the norm had never existed in the first place (Acharya, 2014; Wiener, 2018). Assuming such a perspective would imply reconsidering the potential of global environmental governance through global norms. If there is no universal understanding of global norms, solutions for global problems based on norms might be unsuccessful when understandings of norms and practical implication diverge too much. In light of lacking mechanisms to guarantee international cooperation on climate change, such a pessimistic take on norms sheds a dire outlook on solving the ‘super wicked’ problem of climate change. Another objection a critical constructivist could raise is that the global net-zero norm could only be so successful, meaning its broad international uptake by states but also other actors, *because* of its vague definition that could be integrated into various contexts and perspectives. Adopting this view would mean that the net-zero norm does not present an ambitious environmental norm to contribute to improved sustainability outcomes, but rather a watered-down and diluted concept that lends a ‘green touch’ to states’ policies. This would necessarily lead to questioning their potential for creating political change for the better and resulting in improved environmental governance. And it would also require reconsidering the role of the IPCC for synthesizing policy-relevant knowledge for limiting climate change to save levels, because the IPCC presents the epistemic norm entrepreneur creating and advocating for this norm. With regards to the theory of the norm life cycle, this would also imply to critically question the usefulness of the concept of norm entrepreneurs itself.

With regards to the central aspects of transparency and accountability in climate governance, this thesis demonstrated the differential outcomes thereof in the norm localization by Sweden, China and Fiji. Future research should work to identify the conditions under which global norms for environmental governance contribute to transparent and accountable policy implementation as well as ambitious and effective climate action. Specifically, research could ask which factors condition and aid the implementation of global norms into national law like Climate Change Acts, as this presents an opportunity for increasing accountability through national relations. Complementing this, research should

also investigate the effectiveness of national institutional arrangements that are designed to increase transparency and raise ambition for climate action. Examining the impact of independent expert bodies to evaluate and thereby contribute to ambitious climate policy, as implemented in Sweden for example, is important as well. This assessment could provide valuable insights into the potential strengths and weaknesses thereof, and serve as criteria for the creation of such bodies in other parts of the world.

Future research should also address the underlying questions of responsibility, equity and justice with regards to the net-zero norm, which already surface in the norm localization of the three states analyzed. These themes have shaped the climate regime from its onset and contributed to divides and cooperation problems in the past, and are thus no new questions. However, in the context of reducing global emissions to net-zero, these discussions become more salient and critical than ever (Rogelj et al., 2021). The question is no longer if emissions should be reduced to eventually reach net-zero, but who should reduce their emissions by how much in what course of time. Discussions over which countries should achieve net-zero emissions earlier than 2050 to allow others to continue with reduced but positive emissions until after 2050 need to be held (Rogelj et al., 2021). Other questions with ethical implications also concern the use of offsets to achieve net-zero emissions (Bumpus & Liverman, 2008). From a critical political economy perspective, the net-zero norm seems to reinstate global relations of power. As long as wealthy countries from the Global North can achieve their net-zero pledges through the large-scale use of offsets achieved in the Global South, they can continue causing the problem of climate change but present themselves as moral leaders. Such questions will become more critical as we approach the mid of the century and the remaining time and carbon budget are depleting. This includes theoretical and scientific underpinning of rationales and potential scenarios at the international level, to ensure that both justice and climate concerns are simultaneously addressed and allow for establishing fair and effective governance arrangements.

8. References

- Acharya, A. (2004). How Ideas Spread: Whose Norms Matter? Norm Localization and Institutional Change in Asian Regionalism. *International Organization*, 58(2), 239–275. <https://doi.org/10.1017/S0020818304582024>
- Acharya, A. (2014). Rethinking Power, Institutions and Ideas in World Politics – Whose IR? (1st ed.) *Routledge*. <https://doi.org/10.4324/9781315885346>
- Action Plan for Carbon Dioxide Peaking Before 2030. (2021). Department of Resource Conservation and Environmental Protection, People's Republic of China. Retrieved October 23, 2021, from https://en.ndrc.gov.cn/policies/202110/t20211027_1301020.html
- Alcott, B. (2005). Jevons' paradox. *Ecological Economics*, 54(1), 9–21. <https://doi.org/10.1016/J.ECOLECON.2005.03.020>
- Apergis, N. (2016). Environmental Kuznets curves: New evidence on both panel and country-level CO2 emissions. *Energy Economics*, 54, 263–271. <https://doi.org/10.1016/J.ENERCO.2015.12.007>
- Barrett, S. (2016). Collective Action to Avoid Catastrophe: When Countries Succeed, When They Fail, and Why. *Global Policy*, 7, 45–55. <https://doi.org/10.1111/1758-5899.12324>
- Barrett, S., & Dannenberg, A. (2012). Climate negotiations under scientific uncertainty. *Proceedings of the National Academy of Sciences of the United States of America*, 109(43), 17372–17376. <https://doi.org/10.1073/pnas.1208417109>
- Barritt, E. (2021). Consciously transnational: Urgenda and the shape of climate change litigation: The State of the Netherlands (Ministry of Economic Affairs and Climate Policy) v Urgenda Foundation. *Environmental Law Review*, 22(4), 296–305. <https://doi.org/10.1177/1461452920974493>
- Battersby, S. (2017). Can humankind escape the tragedy of the commons? *Proceedings of the National Academy of Sciences of the United States of America*, 114(1), 7–10. <https://doi.org/10.1073/pnas.1619877114>
- Bernstein, S. (2002). Liberal Environmentalism and Global Environmental Governance. *Global Environmental Politics*, 2(3), 1–16. <https://doi.org/10.1162/152638002320310509>
- Biermann, F., & Pattberg, P. (2008). Global Environmental Governance: Taking Stock, Moving Forward. *Annual Review of Environment and Resources*, 33, 277–294. <https://doi.org/10.1146/ANNUREV.ENVIRON.33.050707.085733>
- Björkdahl, A. (2002). Norms in international relations: Some conceptual and methodological reflections. *Cambridge Review of International Affairs*, 15(1), 9–23. <https://doi.org/10.1080/09557570220126216>
- Black, R., Cullen, K., Fay, B., Hale, T., Lang, J., Mahmood, S., & Smith, S. (2021). *Taking stock: A global assessment of net zero targets*. Energy & Climate Intelligence Unit; Oxford Net Zero. Retrieved October 4, 2021 from https://ca1-eci.edcdn.com/reports/ECIU-Oxford_Taking_Stock.pdf?v=1616461369
- Bumpus, A. G., & Liverman, D. M. (2008). Accumulation by decarbonization and the governance of carbon offsets. *Economic Geography*, 84(2), 127–155. <https://doi.org/10.1111/J.1944-8287.2008.TB00401.X>

- Carattini, S., Levin, S., & Tavoni, A. (2019). Cooperation in the Climate Commons. *Review of Environmental Economics and Policy*, 13(2), 227–247. <https://doi.org/10.1093/reep/rez009>
- Chan, N. (2021). Linking ocean and climate change governance. *Wiley Interdisciplinary Reviews: Climate Change*, 12(4), e711. <https://doi.org/10.1002/WCC.711>
- China's Mid-Century Long-Term Low Greenhouse Gas Emission Development Strategy (Unofficial Translation). (2021). People's Republic of China. Retrieved October 23, 2021, from <https://unfccc.int/documents/307765>
- Christensen, M., & Wormbs, N. (2017). Global Climate Talks from Failure to Cooperation and Hope: Swedish News Framings of COP15 and COP21. *Environmental Communication*, 11(5), 682–699. <https://doi.org/10.1080/17524032.2017.1333964>
- Christoff, P. (2010). Cold climate in Copenhagen: China and the United States at COP15. *Environmental Politics*, 19(4), 637–656. <https://doi.org/10.1080/09644016.2010.489718>
- Clapp, J., & Swanston, L. (2009). Doing away with plastic shopping bags: international patterns of norm emergence and policy implementation. *Environmental Politics*, 18(3), 315–332. <https://doi.org/10.1080/09644010902823717>
- Cléménçon, R. (2016). The Two Sides of the Paris Climate Agreement: Dismal Failure or Historic Breakthrough? *The Journal of Environment & Development*, 25(1), 3–24. <https://doi.org/10.1177/1070496516631362>
- Climate Action Tracker. (2020). *Paris Agreement turning point: Wave of net zero targets reduces warming estimate to 2.1°C in 2100 All eyes on 2030 targets*. New Climate; Climate Analytics. Retrieved October 15, 2021 from https://climateactiontracker.org/documents/829/CAT_2020-12-01_Briefing_GlobalUpdate_Paris5Years_Dec2020.pdf
- Climate Change Bill 2021. (2021). Bill No. 31 of 2021, Parliament of the Republic of Fiji. Retrieved December 3, 2021 from <http://www.parliament.gov.fj/wp-content/uploads/2021/08/Bill-31-Climate-Change-Bill-2021.pdf>
- Creutzig, F., Ravindranath, N. H., Berndes, G., Bolwig, S., Bright, R., Cherubini, F., Chum, H., Corbera, E., Delucchi, M., Faaij, A., Fargione, J., Haberl, H., Heath, G., Lucon, O., Plevin, R., Popp, A., Robledo-Abad, C., Rose, S., Smith, P., ... Masera, O. (2015). Bioenergy and climate change mitigation: an assessment. *GCB Bioenergy*, 7(5), 916–944. <https://doi.org/10.1111/GCBB.12205>
- Destek, M. A., Sarkodie, S. A., & Asamoah, E. F. (2021). Does biomass energy drive environmental sustainability? An SDG perspective for top five biomass consuming countries. *Biomass and Bioenergy*, 149, 106076. <https://doi.org/10.1016/J.BIOMBIOE.2021.106076>
- Eimer, T. R., Lütz, S., & Schüren, V. (2016). Varieties of localization: international norms and the commodification of knowledge in India and Brazil. *Review of International Political Economy*, 23(3), 450–479. <https://doi.org/10.1080/09692290.2015.1133442>
- Engelkamp, S., & Glaab, K. (2015). Writing Norms: Constructivist Norm Research and the Politics of Ambiguity. *Alternatives: Global, Local, Political*, 40(3–4), 201–218. <https://doi.org/10.1177/0304375415612270>
- Eriksson, M. (2020). Afforestation and avoided deforestation in a multi-regional integrated assessment model. *Ecological Economics*, 169, 106452. <https://doi.org/10.1016/j.ecolecon.2019.106452>

- Favero, A., Daigneault, A., & Sohngen, B. (2020). Forests: Carbon sequestration, biomass energy, or both? *Science Advances*, 6, 1–13.
https://doi.org/10.1126/SCIADV.AAY6792/SUPPL_FILE/AAY6792_SM.PDF
- Ferreira, P. G. (2016). ‘Common But Differentiated Responsibilities’ in the National Courts: Lessons from Urgenda v. The Netherlands. *Transnational Environmental Law*, 5(2), 329–351. <https://doi.org/10.1017/S2047102516000248>
- Fiji Low Emission Development Strategy 2018-2050. (2018). Ministry of Economy, Government of the Republic of Fiji. Retrieved November 29, 2021 from https://unfccc.int/sites/default/files/resource/Fiji_Low%20Emission%20Development%20%20Strategy%202018%20-%20202050.pdf
- Finnemore, M., & Sikkink, K. (1998). International Norm Dynamics and Political Change. *International Organization*, 52(4), 887–917. <https://doi.org/10.1162/002081898550789>
- Flick, U., von Kardoff, E., & Steinke, I. (2004). The Analysis of Semi-structured Interviews. U. Flick, E. von Kardoff, & I. Steinke (Eds.), *A Companion to QUALITATIVE RESEARCH* (1st ed., pp. 3–11). Sage Publications.
- Fuglestedt, J., Rogelj, J., Millar, R. J., Allen, M., Boucher, O., Cain, M., Forster, P. M., Kriegler, E., & Shindell, D. (2018). Implications of possible interpretations of greenhouse gas balance in the Paris Agreement. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 376(2119), 1–17.
<https://doi.org/10.1098/RSTA.2016.0445>
- Gach, E. (2019). Normative shifts in the global conception of climate change: The growth of climate justice. *Social Sciences*, 8(24), 1–18. <https://doi.org/10.3390/SOCSCI8010024>
- Grantham Research Institute on Climate Change and the Environment. (2021). *Climate Change Act 2021 - Fiji - Climate Change Laws of the World*. London School of Economics. Retrieved November 19, 2021 from <https://climate-laws.org/geographies/fiji/laws/climate-change-act-2021>
- Gupta, A., Boas, I., & Oosterveer, P. (2020). Transparency in global sustainability governance: to what effect? *Journal of Environmental Policy & Planning*, 22(1), 84–97.
<https://doi.org/10.1080/1523908X.2020.1709281>
- Gupta, A., & Mason, M. (2016). Disclosing or obscuring? The politics of transparency in global climate governance. *Current Opinion in Environmental Sustainability*, 18, 82–90.
<https://doi.org/10.1016/J.COSUST.2015.11.004>
- Gupta, A., & van Asselt, H. (2019). Transparency in multilateral climate politics: Furthering (or distracting from) accountability? *Regulation & Governance*, 13(1), 18–34.
<https://doi.org/10.1111/REGO.12159>
- Haas, P. M. (1992). Introduction: Epistemic Communities and International Policy Coordination on JSTOR. *International Organization*, 46(1), 1–35.
- Healey, P., Scholes, R., Lefale, P., & Yanda, P. (2021). Governing Net Zero Carbon Removals to Avoid Entrenching Inequities. *Frontiers in Climate*, 3, 1-38.
<https://doi.org/10.3389/FCLIM.2021.672357>
- Hsieh, H.-F., & Shannon, S. E. (2005). Three Approaches to Qualitative Content Analysis: *Qualitative Health Research*, 15(9), 1277–1288.
<https://doi.org/10.1177/1049732305276687>

- Hubacek, K., Chen, X., Feng, K., Wiedmann, T., & Shan, Y. (2021). Evidence of decoupling consumption-based CO₂ emissions from economic growth. *Advances in Applied Energy*, 4, 100074. <https://doi.org/10.1016/J.ADAPEN.2021.100074>
- Ingebritsen, C. (2002). Norm Entrepreneurs Scandinavia's Role in World Politics. *Cooperation and Conflict*, 37(1), 11–23. <https://doi.org/https://doi.org/10.1177/0010836702037001689>
- IPCC. (2014). *Summary For Policymakers. In: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. IPCC. https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf
- Jinnah, S. (2011). Climate Change Bandwagoning: The Impacts of Strategic Linkages on Regime Design, Maintenance, and Death. *Global Environmental Politics*, 11(3), 1–9. https://doi.org/10.1162/GLEP_A_00065
- Jung, H. (2019). The Evolution of Social Constructivism in Political Science: Past to Present. *SAGE Open*, 9(1), 1–10. <https://doi.org/10.1177/2158244019832703>
- Kaika, D., & Zervas, E. (2013). The Environmental Kuznets Curve (EKC) theory—Part A: Concept, causes and the CO₂ emissions case. *Energy Policy*, 62, 1392–1402. <https://doi.org/10.1016/J.ENPOL.2013.07.131>
- Karlsson-Vinkhuyzen, S. I., Groff, M., Tamás, P. A., Dahl, A. L., Harder, M., & Hassall, G. (2017). Climate Policy Entry into force and then? The Paris agreement and state accountability. *Climate Policy*, 18(5), 593–599. <https://doi.org/10.1080/14693062.2017.1331904>
- Karlsson, M. (2021). Sweden's Climate Act – its origin and emergence. *Climate Policy*, 21(9), 1132–1145. <https://doi.org/10.1080/14693062.2021.1922339>
- Keohane, R. O., & Oppenheimer, M. (2016). Paris: Beyond the Climate Dead End through Pledge and Review? *Politics and Governance*, 4(3), 142–151. <https://doi.org/https://doi:10.17645/pag.v4i3.634>
- Lawless, S., Song, A. M., Cohen, P. J., & Morrison, T. H. (2020). Rights, equity and justice: A diagnostic for social meta-norm diffusion in environmental governance. *Earth System Governance*, 6, 1-13. <https://doi.org/10.1016/J.ESG.2020.100052>
- Lazarus, R. J. (2009). Super Wicked Problems and Climate Change: Restraining the Present to Liberate the Future. *Cornell Law Review*, 94, 1153–1234. <http://scholarship.law.cornell.edu/clr/vol94/iss5/3/>
- Lenton, T. M. (2011). Beyond 2°C: redefining dangerous climate change for physical systems. *Wiley Interdisciplinary Reviews: Climate Change*, 2(3), 451–461. <https://doi.org/10.1002/WCC.107>
- Levin, K., Cashore, B., Bernstein, S., & Auld, G. (2012). Overcoming the tragedy of super wicked problems: constraining our future selves to ameliorate global climate change. *Policy Sciences*, 45(2), 123–152. <https://doi.org/10.1007/S11077-012-9151-0>
- Lewis, S. L., Wheeler, C. E., Mitchard, E. T. A., & Koch, A. (2019). Restoring natural forests is the best way to remove atmospheric carbon. *Nature*, 568(7750), 25–28. <https://doi.org/10.1038/d41586-019-01026-8>
- Livingston, J. E., & Rummukainen, M. (2020). Taking science by surprise: The knowledge politics of the IPCC Special Report on 1.5 degrees. *Environmental Science & Policy*, 112, 10–16. <https://doi.org/10.1016/J.ENVSCI.2020.05.020>

- Lövbrand, E. (2014). Knowledge and the Environment. M. Betsill, K. Hochstetler, & D. Stevis (Eds.), *Advances in International Environmental Politics* (1st ed., pp. 161–184). Palgrave Macmillan.
- Mason, M. (2019). Transparency, accountability and empowerment in sustainability governance: a conceptual review. *Journal of Environmental Policy & Planning*, 22(1), 98–111. <https://doi.org/10.1080/1523908X.2019.1661231>
- Matti, S., Petersson, C., & Söderberg, C. (2021). The Swedish climate policy framework as a means for climate policy integration: an assessment. *Climate Policy*, 21(9), 1146–1158. <https://doi.org/10.1080/14693062.2021.1930510>
- Mayring, P. (2004). Qualitative Content Analysis. U. Flick, E. von Kardoff, & I. Steinke (Eds.), *A Companion to QUALITATIVE RESEARCH* (1st ed., pp. 266–269). Sage Publications.
- Miles, B. (2012). Discourse Analysis. N. J. Salkind (Eds.), *Encyclopedia of Research Design* (pp. 368–370). SAGE Publications. <https://doi.org/https://dx.doi.org/10.4135/9781412961288>
- Minx, J. C., Callaghan, M., Lamb, W. F., Garard, J., & Edenhofer, O. (2017). Learning about climate change solutions in the IPCC and beyond. *Environmental Science & Policy*, 77, 252–259. <https://doi.org/10.1016/J.ENVSCI.2017.05.014>
- National Climate Change Policy. (2019). Ministry of Economy, Government of the Republic of Fiji. Retrieved January 7, 2022, from <https://www.economy.gov.fj/images/CCIC/uploads/General/FIJI-National-Climate-Change-Policy-2018-2030-FINAL.pdf>
- O’Neill, K. (2009). Introduction: The environment and international relations. *The Environment and International Relations* (pp. 1–23). Cambridge University Press. <https://doi.org/10.1017/CBO9780511805974>
- Oberthür, S. (2016). Reflections on Global Climate Politics Post Paris: Power, Interests and Polycentricity. *The International Spectator*, 51(4), 80–94. <https://doi.org/10.1080/03932729.2016.1242256>
- Order of the First Senate of 24 March 2021. (2021). *1 BvR 2656/18 - , paras. 1-270*. Bundesverfassungsgericht, Karlsruhe, Germany. https://www.bundesverfassungsgericht.de/e/rs20210324_1bvr265618en.html
- Parker, I. (2004). Discourse Analysis. U. Flick, E. von Kardoff, & I. Steinke (Eds.), *A Companion to QUALITATIVE RESEARCH* (1st ed., pp. 308–312). Sage Publications.
- Parrique, T., Barth, J., Briens, F., Kerschner, C., Kraus-Polk, A., Kuokkanen, A., & Spangenberg, J. H. (2019). *Evidence and arguments against green growth as a sole strategy for sustainability*. European Environmental Bureau. eeb.org/decoupling-debunked
- Petersen, J. (2018). *International norm diffusion processes and their outcomes on the ground: The case of de-institutionalising child protection in Cape Town* [doctoral dissertation, University of Hamburg]. Hamburg University Research Repository. <https://ediss.sub.uni-hamburg.de/handle/ediss/6262?mode=full>
- Raymond, G. A. (1997). Neutrality Norms and the Balance of Power. *Cooperation and Conflict*, 32(2), 123–146. <https://doi.org/10.1177/0010836797032002001>

- Rogelj, J., Geden, O., Cowie, A., & Reisinger, A. (2021). Net-zero emissions targets are vague: three ways to fix. *Nature*, *591*(7850), 365–368. <https://doi.org/10.1038/d41586-021-00662-3>
- Schleussner, C.-F., Rogelj, J., Schaeffer, M., Lissner, T., Licker, R., Fischer, E. M., Knutti, R., Levermann, A., Frieler, K., & Hare, W. (2016). Science and policy characteristics of the Paris Agreement temperature goal. *Nature Climate Change*, *6*, 827–835. <https://doi.org/10.1038/NCLIMATE3096>
- Schmidt, C. (2004). The Analysis of Semi-structured Interviews. U. Flick, E. von Kardoff, & I. Steinke (Eds.), *A Companion to QUALITATIVE RESEARCH* (1st ed., pp. 253–258). Sage Publications.
- Shahbaz, M., & Sinha, A. (2019). Environmental Kuznets curve for CO2 emissions: a literature survey. *Journal of Economic Studies*, *46*(1), 106–168. <https://doi.org/10.1108/JES-09-2017-0249/FULL/XML>
- Sorrell, S. (2009). Jevons' Paradox revisited: The evidence for backfire from improved energy efficiency. *Energy Policy*, *37*(4), 1456–1469. <https://doi.org/10.1016/J.ENPOL.2008.12.003>
- Steckel, J. C., Edenhofer, O., & Jakob, M. (2015). Drivers for the renaissance of coal. *PNAS*, *112*(29), E3775–E3781. https://doi.org/10.1073/PNAS.1422722112/SUPPL_FILE/PNAS.1422722112.SAPP.PDF
- Sweden's Long-Term Strategy for Reducing Greenhouse Gas Emissions (2020). Ministry of the Environment, Government Offices of Sweden. Retrieved November 4, 2021, from <https://www.economy.gov.fj/images/CCIC/uploads/General/FIJI-National-Climate-Change-Policy-2018-2030-FINAL.pdf>
- Swedish Climate Act. (2017). Ministry of the Environment and Energy, Government Offices of Sweden. Retrieved October 29, 2021, from <https://www.government.se/49c150/contentassets/811c575eb9654a6383cf0ed4e0d5db14/the-swedish-climate-act.pdf>
- Swedish Climate Policy Framework. (2017). Ministry of the Environment and Energy, Government Offices of Sweden. Retrieved October 29, 2021, from <https://www.government.se/495f60/contentassets/883ae8e123bc4e42aa8d59296ebe0478/the-swedish-climate-policy-framework.pdf>
- Turnhout, E., Dewulf, A., & Hulme, M. (2016). What does policy-relevant global environmental knowledge do? The cases of climate and biodiversity. *Current Opinion in Environmental Sustainability*, *18*, 65–72. <https://doi.org/10.1016/J.COSUST.2015.09.004>
- UNFCCC. (1997). *Kyoto Protocol to the United Nations Framework Convention on Climate Change (Document FCCC/CP/1997)*. <https://unfccc.int/resource/docs/convkp/kpeng.pdf>
- UNFCCC. (2015). *Adoption of the Paris Agreement (Document FCCC/CP/2015/10)*. UNFCCC, Paris. https://unfccc.int/sites/default/files/english_paris_agreement.pdf
- van Leeuwen, J. (2015). The regionalization of maritime governance: Towards a polycentric governance system for sustainable shipping in the European Union. *Ocean & Coastal Management*, *117*, 23–31. <https://doi.org/10.1016/J.OCECOAMAN.2015.05.013>
- Wang, J., Yang, Y., Bentley, Y., Geng, X., & Liu, X. (2018). Sustainability Assessment of Bioenergy from a Global Perspective: A Review. *Sustainability*, *10*(8), 2739. <https://doi.org/10.3390/SU10082739>

- Weikmans, R., Van Asselt, H., & Roberts, J. T. (2019). Climate Policy Transparency requirements under the Paris Agreement and their (un)likely impact on strengthening the ambition of nationally determined contributions (NDCs). *Climate Policy*, 20(4), 511–526. <https://doi.org/10.1080/14693062.2019.1695571>
- Widerberg, O., & Pattberg, P. (2017). Accountability Challenges in the Transnational Regime Complex for Climate Change. *Review of Policy Research*, 34(1), 68–87. <https://doi.org/10.1111/ROPR.12217>
- Wiener, A. (2018). Contestation and Constitution of Norms in Global International Relations. (1st ed.) *Cambridge University Press*. <https://doi.org/10.1017/9781316718599>
- Wiener, A. (2020). *Norm(ative) Change in International Relations: A Conceptual Framework*. KFG Working Paper Series, No. 44. Berlin Potsdam Research Group “The International Rule of Law – Rise or Decline?”. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3638205
- Winanti, P. S., & Hanif, H. (2020). When global norms meet local politics: Localising transparency in extractive industries governance. *Environmental Policy and Governance*, 30(5), 263–275. <https://doi.org/10.1002/EET.1907>
- World Resources Institute. (2021). *Climate Watch Net-Zero Tracker*. World Resources Institute. Retrieved September 18, 2021 from <https://www.climatewatchdata.org/net-zero-tracker>
- Wunderlich, C. (2020). *Rogue States as Norm Entrepreneurs - Black Sheep or Sheep in Wolves' Clothing?* (1st ed.) Springer International Publishing. <https://doi.org/https://doi.org/10.1007/978-3-030-27990-5>
- Xi, J. (December 12, 2020). Climate Ambition Summit 2020 [audio recording]. Retrieved September 23, 2021 from <https://www.climateambitions summit2020.org/ondemand.php>
- Young, O. R. (2011). Effectiveness of international environmental regimes: Existing knowledge, cutting-edge themes, and research strategies. *Proceedings of the National Academy of Sciences*, 108(50), 19853–19860. <https://doi.org/10.1073/PNAS.1111690108>
- Zhang, S., & Chen, W. (2022). Assessing the energy transition in China towards carbon neutrality with a probabilistic framework. *Nature Communications* 2022 13:1, 13(1), 1–15. <https://doi.org/10.1038/s41467-021-27671-0>
- Zhao, X., Ma, X., Chen, B., Shang, Y., & Song, M. (2022). Challenges toward carbon neutrality in China: Strategies and countermeasures. *Resources, Conservation and Recycling*, 176, 105959. <https://doi.org/10.1016/J.RESCONREC.2021.105959>
- Zwingel, S. (2012). How Do Norms Travel? Theorizing International Women’s Rights in Transnational. *Source: International Studies Quarterly*, 56(1), 115–129. <https://doi.org/10.1111/j.1>
- Zwolski, K., & Kaunert, C. (2011). The EU and climate security: a case of successful norm entrepreneurship? *European Security*, 20(1), 21–43. <https://doi.org/10.1080/09662839.2010.526108>

Appendix A: List of interview questions for RQ1

1. The IPCC is tasked with synthesizing the state of knowledge in climate sciences with regards to the causes and consequences of climate change.

Questions:

- a) How does the IPCC interact with the global climate regime and climate politics through advocating and presenting new forms of knowledge?
 - b) How does the IPCC communicate their scientific findings to policymakers?
 - c) Do they support certain ways of looking at the problem of climate change through their communication and engagement?
 - d) What position does the IPCC communicate from and how are they perceived in the climate regime? As an epistemic community or rather as a moral authority?
2. The IPCC has the mandate of producing policy-relevant but never policy prescriptive knowledge.

Questions:

- a) From the experience of your research, how does the mandate of producing policy-relevant insights influence how the IPCC internally decides what knowledge to present, and also how to present it?
 - b) How does this mandate of policy relevance without policy prescriptiveness apply to the net-zero emissions concept?
 - c) How does this mandate condition with the vague definition of the concept?
 - d) What are the potential implications of policy prescriptive knowledge presentation?
3. The IPCC introduced the concept of net-zero emissions to the international climate change regimes through presenting it in its Fifth Assessment Report as the result of their quantitative modeling.

Questions:

- a) How do you judge this presentation of the net-zero concept by the IPCC to the global climate regime, especially with regards to the vague definition thereof?
- b) What are the political implications for implementing this vague concept?
- c) How is this motivated? What are the reasons for the IPCC to present a rather unrealistic concept as the solution for climate change?
- d) Would you criticize the IPCC's engagement with and advocacy for the net-zero emissions concept? If so, what would you criticize?
- e) What would you identify as positive impacts of the IPCC's engagement with and advocacy for the net-zero emissions concept?

4. The IPCC has become to occupy a central position in the climate regime for providing the scientific basis for international climate action.

Questions:

- a) Once the IPCC has disseminated their findings through the means of their reports, how much can they influence how this knowledge and concepts are used in practice?
- b) What role do you see for the IPCC in governing climate change in the future?
- c) How can the IPCC contribute to effective climate governance in the future?

Appendix B: List of interview questions for RQ2

1. In your research you have looked at how Sweden (but also Australia, Norway or the EU) has addressed various environmental issues and concerns such as deforestation, biodiversity decline, ecological restoration and climate protection through policy.

Questions:

- e) How does Sweden conceptualize environmental issues, and climate change specifically? How does this compare to other states and supranational political bodies?
- f) What are underlying notions and norms about environmental issues that shape Swedish policy responses to address climate change?

2. As the first state ever, in 2017 Sweden has announced the goal of achieving net-zero emissions of greenhouse gases by 2045 as part of the then established Climate Policy Framework. In doing so, Sweden became the first state to implement the global ambition of striving for “a balance between anthropogenic emissions by sources and removal by sinks of greenhouse gases” as stated in the Paris Agreement (2015) in national policy.

Questions:

- d) How does the implementation of net-zero emissions in 2017 relate to the previous climate policy context in Sweden?
- e) How does the goal of net-zero emissions fit into the Swedish normative structure and developments surrounding climate change?
- f) How would you explain the motives for Sweden to assume a frontrunner position internationally in implementing the goal of net-zero emissions into policy?
- g) What political national motives for the Swedish government and governing parties does the implementation of the net-zero emissions goal serve?
- h) What factors explain and contributed to the strong political consensus in 2017 to pass the Climate Policy Framework including the net-zero emissions goal?

5. In the Paris Agreement (2015), head of states agreed to net-zero emissions as the political goal necessary for limiting climate change below 2°C. Besides the general description of net-zero emissions as “a balance between anthropogenic emissions by sources and removal by sinks of greenhouse gases” by mid-century, the Paris Agreement does not offer further specifications to this political goal.

In establishing the Swedish Climate Policy Framework, the Swedish parliament adapted and specified this broad concept: The Climate Goals of the Swedish Climate Policy Framework state the target to achieve net-zero emissions by 2045 and achieve net-negative emissions thereafter. Furthermore, the Climate Goals state that net-zero emissions need to be achieved through a reduction of emissions by at least 85% compared to 1990, meaning that the remaining 15% may be achieved through offsetting and sinks. Other states who have announced the ambition to achieve net-zero emissions often do not specify the share of emission reduction and offsetting / sinks for contributing to net-zero

emissions, rely on a longer timeframe to achieve net-zero emissions, and do not commit to net-negative emissions.

Questions:

- a) What goals does Sweden pursue internationally with this explicit and ambitious interpretation of the net-zero emissions concept?
 - b) What motives does this serve on the level of national politics?
 - c) What factors explain that Swedish policymakers and parliamentarians agreed on concrete emission reduction targets (85% reduction in 2045 compared to 1990) and a concrete share of sinks and offsets (15%) for achieving net-zero emissions?
 - d) How do you explain that Swedish policymakers also passed the goal of achieving net-negative emissions, when technologies to achieve that remain highly speculative?
 - e) What roles do concerns for international reputation and ambitions to strengthen national legitimacy play in the Swedish adaptation of the net-zero emissions concept, especially in this ambitious form?
6. In addition to the Climate Goals, the Climate Policy Framework also establishes the Climate Policy Council to evaluate if the government's climate policy is in line with the Climate Goals. Please answer the following questions from your experience serving to the Climate Policy Council from 2018 until 2021.

Questions:

- a) How does the creation of the Climate Policy Council contribute to the government's accountability for effective climate policy?
- b) In what ways has and still does the Climate Policy Council change how climate policy is being made in Sweden?
- c) What are weaknesses in the mandate and effectiveness of the Climate Policy Council that should be addressed? How could this be achieved?

Appendix C: List of codes

● NET ZERO INTERPRETATION

- Terminology & definition
- GHGs coverage
- Interim targets
- Timeframes
- Target specification into ER and CDR

● NORMS AND IDEAS

- Common but differentiated responsibility
- Equity and respective capabilities
- Economic growth
- Efficiency & energy saving
- Sustainable development
- Green growth
- National self-interest

● CLIMATE REGIME

- Positioning: vulnerability, victim to negative impacts of climate change
- Positioning: challenges as a developing country
- Positioning: right to (economic) development
- Positioning: contributions to climate change mitigation
- Positioning: leaderships
- Demands to other states: increasing ambition
- Demands to other states: political cooperation
- Demands to other states: support from developed to developing countries
- Demands to other states: political cooperation

● POLICY TYPES FOR IMPLEMENTATION

- Economic instruments: markets
- Economic instruments: taxes
- Economic instruments: subsidies
- Regulative instruments: bans & restrictions
- Regulative instruments: standards