



Policy Evaluation Framework

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Scope & Context

The objectives of this food waste Policy Evaluation Framework are to help policy makers assess, monitor and track progress of policy measures (in place and to be developed) to prevent and reduce food waste, including (but not limited to) via social innovation, to present indicators and criteria to evaluate such policies, and to identify any barriers that policies may indirectly cause in reducing and preventing food waste. Since the food waste Policy Evaluation Framework is aimed at policy makers at the European Union (EU), national, regional and local level, it is intended to be flexible enough to address all different policy levels (i.e. local, national, EU).

The causes of food waste generation along the food supply chain are both many and varied. The EU FUSIONS report *"Drivers of current food waste generation, threats of future increase and opportunities for reduction"*¹ identified more than 105 drivers for the current causes of food waste generation: 28 related to technology, 38 to business management and economy, 23 to legislation and 16 to consumer behaviour and lifestyles.

The High Level Panel of Experts on Food Security and Nutrition shows that causes of food waste are often relevant on the micro-, meso-, and macro- level. It proposed to distinguish a hierarchy of causes, with policies often playing a major role as macro causes and potentially as enabling solutions throughout the food system.²

The food waste drivers related to legislation and policy are also very diverse, as food waste is a multi-sectorial topic and interconnects different policy areas at different levels with a number of interrelated and indirect effects. The EU FUSIONS report *"Review of EU Member States legislation and policies addressing food waste"*³ identified 52 legislative acts on the EU level that have an indirect implication on food waste within seven of the 20 areas covered by EU legislation and policies: agriculture, fisheries, industrial policy, taxation, economic and monetary policy, environment, consumers and health protection.⁴

Considering this complex setting, it is favourable for policy makers to evaluate the impact of the current policies on food waste reduction and generation at the EU, national, regional and local level.

To date, at the European Commission (EC) level, the EU Better Regulation Guidelines⁵ methodology is used as a support tool on how to prepare for a policy evaluation, for example via impact assessments, in order to ultimately assess the actual performance of EU interventions compared to initial expectations. The Commission is committed to

¹ EU FUSIONS, 2014. Drivers of current food waste generation, threats of future increase and opportunities for reduction, available here <http://www.eu-fusions.org/index.php/download?download=111:drivers-of-current-food-waste-generation-threats-of-future-increase-and-opportunities-for-reduction>

² HLPE, 2014

³ EU FUSIONS 2015. Review of current EU Member States legislation and policies addressing food waste, available here <http://www.eu-fusions.org/phocadownload/Reports/France%20FULL%20pdf.pdf>

⁴ Vittuari, M., Gaiani, S., Canali, M., et al. (2015), Review of current EU Member States legislation and policies with implications on food waste. Report from EU FUSIONS project, available here: <http://www.eu-fusions.org/index.php/publications>

⁵ European Commission (2015), Better Regulation "Toolbox", available here http://ec.europa.eu/smart-regulation/index_en.htm
http://ec.europa.eu/smart-regulation/guidelines/toc_tool_en.htm

evaluate in a proportionate way all EU spending and non-spending activities intended to have an impact on society or the economy.

By undergoing policy evaluations, the Commission takes a critical look at whether EU activities are fit for its expected purposes and if they deliver, at a minimum cost, the desired changes to European businesses and citizens as well as contribute to the EU's general role.

Although out of the scope of this food waste Policy Evaluation Framework (as this framework is only intended to evaluate policies ex-post), it should be noted that on the EU level, the EC carries out fitness checks and ex-post evaluations in parallel. Fitness checks periodically assesses whether the regulatory framework for a policy is fit for identifying excessive regulatory burdens, overlaps, gaps, inconsistencies and obsolete measures which may have appeared over time. It furthermore helps identify the cumulative impact of legislation. Fitness checks move from the "traditional" evaluations of individual policies to a more systemic evaluation taking into consideration the whole picture of the policy framework.

The benefit of this Policy Evaluation Framework is best seen when considering the need to have a structured guideline on how to evaluate direct EU and national policies concerning food waste in an ex-post fashion, as **no methodology** currently exists on how to prepare and conduct evaluations of food waste policies.

Regarding direct EU food-waste-related measures, it could be relevant to consider EU food-waste-related goals included in the revised Circular Economy Package⁶ in late 2015 for evaluation in the coming years. The main goals of the Circular Economy Package, notably to support achievement of the Sustainable Development Goals (SDG) for food waste reduction, include a target to halve per capita food waste at the retail and consumer level by 2030, and reduce food losses along the food production and supply chains.

The food-waste specific Circular Economy Package measures propose to:

- elaborate a **common EU methodology to measure food waste consistently** in co-operation with Member States and stakeholders;
- create a **new platform** involving both Member States and actors of the food chain in order to help define measures needed to achieve the food waste SDG, facilitate inter-sector co-operation, and share best practice and results achieved;
- take measures to **clarify EU legislation related to waste, food and feed** and **facilitate food donation** and the use of former foodstuffs and by-products from the food chain for feed production, without compromising food and feed safety;
- examine ways to **improve the use of date marking** by actors in the food chain and its understanding by consumers, in particular "best before" labelling.

This document outlines the steps to plan, conduct, and analyse food waste policy evaluations and illustrates practical examples of its application to several existent food waste policies and practices throughout Europe.

Key terminology and evaluation methodology outlined in this present document are notably inspired by the above mentioned EU Better Regulation Guidelines⁷ as well as the

⁶ European Commission (2015), Circular Economy Package, available here: http://ec.europa.eu/environment/circular-economy/index_en.htm

⁷ European Commission (2015), Better Regulation "Toolbox", available here http://ec.europa.eu/smart-regulation/index_en.htm

UK's Magenta Book: Guidance for Evaluation⁸. These represent key sources that the methodology used within this policy Evaluation Framework.

The Policy Evaluation Framework draws on and makes links to the work conducted in EU FUSIONS Work Package 3 (T3.1 "Food Waste Legislation Inventory and Analysis of Trends" and T3.2 "Identifying Policies for Social Innovation") along with Work Package 1 (T1.5 "Food Waste Quantification Manual"⁹, and T1.8 "Estimates of European Food Waste Levels and Analysis of Food Waste Drivers")¹⁰.

⁸ HM Treasury (2011), The Magenta Book, Guidance for evaluation, available at: <https://www.gov.uk/government/publications/the-magenta-book>

⁹ Tostivint, C., Stenmarck, Å., Quested, T., et al. (2015), Food Waste Quantification Manual. <http://www.eu-fusions.org/phocadownload/Publications/Food%20waste%20quantification%20manual%20to%20monitor%20food%20waste%20amounts%20and%20progression.pdf>

¹⁰ EU FUSIONS (2012-2015), EU FUSIONS publications, available here: <http://www.eu-fusions.org/index.php/publications>

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1 Terminology

This chapter presents the definitions of important terms that are used throughout this food waste policy Evaluation Framework. Many of these definitions source from the 2014 EU FUSIONS Definitional Framework for Food Waste¹¹.

Term	Definition	Source
Food	Any substance or product, whether processed, partially processed or unprocessed, intended to be, or reasonably expected to be consumed by humans. Food includes drink, chewing gum, and any substance, including water, intentionally incorporated into food during its manufacture, preparation or treatment. ¹²	EU FUSIONS Definitional Framework for Food Waste
Food and inedible parts of food	Edible food, which has or had the potential to be eaten, removed from the food supply chain, and associated inedible parts of food removed from the food supply chain.	EU FUSIONS Definitional Framework for Food Waste
Food waste	Food and inedible parts of food removed from the food supply chain to be recovered or disposed (including: composted, crops ploughed in/not harvested, anaerobic digestion, bioenergy production, co-generation, incineration, disposal to sewer, landfill or discarded to sea).	EU FUSIONS Definitional Framework for Food Waste
Food surplus¹³	Food that has been produced for human consumption, which is still fit for consumption but for various reasons cannot be sold through the intended channels. Such surplus can arise due to manufacturing errors (for example mislabelling, under or overweight packs, etc.), from discontinued promotions or products or local demand not meeting supply and therefore products not having sufficient shelf-life to remain on sale (or passing the 'best before' date).	Elaborated by FUSIONS policy experts

¹¹ EU FUSIONS, 2014. EU FUSIONS Definitional Framework for Food Waste – Full Report – 3 July 2014 <http://www.eu-fusions.org/index.php/publications?download=5:fusions-definitional-framework-for-food-waste>

¹² This definition of food complies with official documents (such as existing legislation) using present definitions of "food"; presented in the EU Regulation (EC) No 178/2002 on general principles and requirements of food law¹² as well as the FAO/WHO Codex Alimentarius Commission on food safety (ALINORM 04/27/33A) Article 3: EU Regulation No 178-2002: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:031:0001:0024:EN:PDF> & FAO/WHO Codex 04/27/33A: <http://www.codexalimentarius.org/input/download/report/618/al0433ae.pdf#page=46>

¹³ Access the link for the FAO's voluntary definitions "**Recovery of safe and nutritious food for human consumption**", "**Redistribution of safe and nutritious food for human consumption**" here: <http://www.fao.org/save-food/news-and-multimedia/news/news-details/en/c/288692/>

Term	Definition	Source
Policy	Policy is a course or principle of action, proposed or adopted by a government, party, business or individual, intended to influence and determine coherent decisions, actions, and other matters; usually with a common long-term purpose(s).	Elaborated from Gupta J et al., 2013; Weimer D. L. et al., 2010.
Evaluation	Assessment of policy effectiveness, efficiency, relevance, coherence and EU-added value during and after implementation. It seeks to measure outcomes and impacts in order to assess whether the anticipated benefits have been realised.	The Magenta Book: Guidance for Evaluation
Regulatory approaches	Regulations and regulatory instruments (sometimes called "command-and-control") are implemented by public authorities and backed by the force of law. Types of regulatory instruments include standards (including planning instruments), licensing, mandatory management plans and covenants, and taxes.	Elaborated by FUSIONS experts on the basis of the information collected in the different FUSIONS countries
National strategies on food waste prevention	Methods, strategies or plans specifically addressing food waste prevention. Key sectors addressed in the plan should include local authorities, households, the hospitality industry, the retail supply chain, businesses and institutions (such as schools and hospitals) along with food producers.	Elaborated by FUSIONS experts on the basis of the information collected in the different FUSIONS countries
Communication and campaigns	National "umbrella" campaigns; local campaigns; short campaigns and festivals; education and training activities; contests and competitions; exhibitions that aim to raise awareness on food waste prevention, reduction, management.	Elaborated by FUSIONS experts on the basis of the information collected in the different FUSIONS countries
Voluntary agreements	Alternative courses of actions such as self-regulations developed by the industry and/other stakeholders to implement or complement public policies.	Elaborated by FUSIONS experts on the basis of the information collected in the different FUSIONS countries
Market based instruments	Policy tools that encourage behavioural change through market signals rather than through explicit directives. There are a range of market based instruments including trading schemes, offset schemes, subsidies and grants, accreditation systems, stewardship payments, taxes and tax concessions.	Elaborated by FUSIONS experts on the basis of the information collected in the different FUSIONS countries
Projects and other measures	Initiatives like neighbourhood projects, food sharing platforms, platform/networks, date labelling, applications, etc. that contribute and/or are connected to food waste reduction.	Elaborated by FUSIONS experts on the basis of the information collected in the different FUSIONS countries

Term	Definition	Source
Social innovation	Ideas that work to address pressing unmet needs. Innovation that is both social in its ends and in its means. Social innovation puts forth new ideas (products, services and models) that simultaneously meet social needs (more effectively than alternatives) and create new social relationships or collaborations.	The Open Book of Social Innovation, Murray, Calulier-Grice and Mulgan, March 2010

2 Purpose of the food waste policy Evaluation Framework

By the end of this chapter, readers will:

- understand how this Policy Evaluation Framework intends to help them assess food waste policy;
- understand how and why policy evaluations are integral to policy relevance;
- learn about the benefits that a sound evaluation can bring to a policy;
- draw on the applicability of the framework towards direct and indirect food waste policies; and
- conceptualise how the “Core Process Flow” of policy evaluations sets the stage for this policy Evaluation Framework.

2.1 Objective

This food waste **Policy Evaluation Framework** aims to help policy makers **assess the effects of policy measures on prevention and reduction of food waste**, including but not limited to via social innovation, and to present indicators and guidance on how to evaluate them. The Policy Evaluation Framework is aimed at policy makers at the EU, national, regional and local level. The Framework will therefore be flexible enough to address all the different levels mentioned above.

Based on the previous work carried out in EU FUSIONS Task 3.1, the **policy measures** to be addressed within the present Policy Evaluation Framework are classified as follows (see Chapter 1 for definitions):

- National strategies on food waste prevention
- Market-based instruments
- Regulations and regulatory instruments
- Voluntary agreements
- Communication and campaigns
- Projects and other measures

This Policy Evaluation Framework provides policy makers with a **methodology** on how to **prepare** and **conduct a food waste prevention and reduction policy evaluation**. Furthermore, it provides guidance on how to **interpret policy evaluation findings in order** to optimise policy measures and its impacts.

The methodology provides a non-exhaustive, yet concrete list of indicators that can be applied to the above-mentioned policy measures. Furthermore, in section 4.3.2 “Self-developed indicators”, criteria are provided on how to develop and use appropriate indicators to evaluate the social, economic and environmental impact of different policy measures. However, not all indicators listed within this document are applicable to all policy measures. Chapter 5 illustrates how specific indicators may be used to evaluate specific policy measures within case studies.

This Policy Evaluation Framework is applicable to policy measures which aim at preventing and/or reducing food waste (e.g. national strategies on food waste prevention, workshops, etc.). By adopting a systemic approach to food waste policy setting, policy makers could also use the quantitative results of different policy evaluations to assess the achievement of local, national or EU food waste reduction targets. The policy evaluation could be conducted in parallel with food waste quantifications at the different levels of the supply chain. Developed within the scope of EU FUSIONS, the “**Food Waste Quantification Manual**”¹⁴, which is a guide for Member States on how to quantify and report food waste, provides a viable outlet to obtain necessary food waste data for an exhaustive evaluation. The EU FUSIONS deliverable “Criteria for and baseline assessment of environmental and socio-economic impacts of food waste”¹⁵ may also serve as support when assessing the economic and social impacts of food waste.

Although food waste prevention and reduction policies often operate within a complex policy environment in which the impacts of individual interventions are difficult to isolate from one another, it is **not** in the scope of this Policy Evaluation Framework to assess simultaneous impacts of different policy measures.

2.2 Core process flow for policy evaluations

Policy evaluations assess the **degree of effectiveness and efficiency of a policy throughout its implementation** in order to **determine whether its foreseen objectives have been attained**.¹⁶ In the context of food waste policy, the reduction and prevention of food waste remain at the heart of its objectives.

The relevance of a policy extends beyond its creation and adoption. In other words, understanding the importance of establishing and carrying out sound evaluations is paramount to a policy’s longevity and relevance. During evaluations, a policy scope can be widened or narrowed by considering political, environmental, and technical advancements which directly and/or indirectly influence its implementation.

A sound evaluation framework must:

- identify and put forth successful policies (to undergo little to no revisions);
- assess policies that are still relevant but that are not reaching their full potential (to undergo moderate to substantial revisions); and
- determine which policies are no longer relevant and too far out of scope to revise (to be retired).

To set the stage for this food waste policy Evaluation Framework, the flow chart below, which is inspired by the European Commission’s “Better Regulation Toolkit”¹⁷, illustrates

¹⁴ Tostivint, C., Stenmarck, Å., Quested, T., et al. (2015), Food Waste Quantification Manual. <http://www.eu-fusions.org/phocadownload/Publications/Food%20waste%20quantification%20manual%20to%20monitor%20food%20waste%20amounts%20and%20progression.pdf>

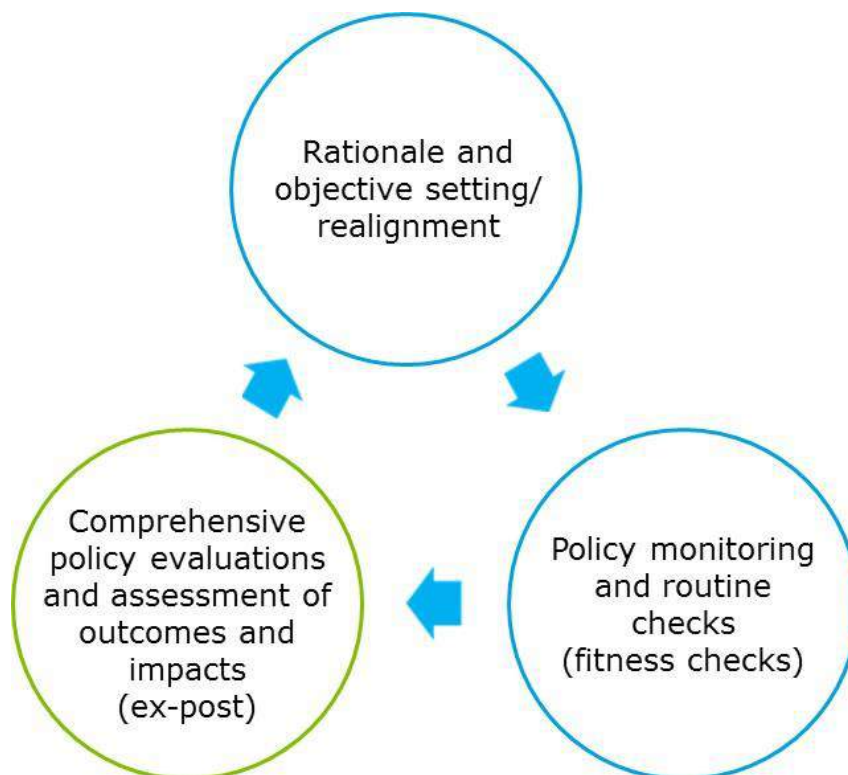
¹⁵ Scherhaufer S., Lebersorger S., Schneider F., et al. (2015), Criteria for and baseline assessment of environmental and socio-economic impacts of food waste.

¹⁶ European Commission (2015), Better Regulation “Toolbox”, available here http://ec.europa.eu/smart-regulation/index_en.htm

¹⁷ European Commission (2015), Better Regulation “Toolbox”, available here http://ec.europa.eu/smart-regulation/guidelines/toc_guide_en.htm

policy evaluations as a non-linear process. A policy is set to unconditionally and flexibly realign its objectives and rational according to the results brought forth through habitual monitoring exercises, extensive evaluations, and a realignment of policy objectives, which are set forth through applied revisions.

Figure 1: Core Process Flow in policy evaluation¹⁸



Although the guidelines provided in this food waste Policy Evaluation Framework feed into all three steps outlined above, its content is specifically geared towards guiding policy makers on how to conduct ex-post evaluations, (i.e. as outlined in the above figure “comprehensive policy evaluations and assessment of outcomes and impacts”)¹⁹. As previously mentioned, the proposed Framework is not intended to directly serve for ex-ante evaluations.

¹⁸ Adapted from the European Commission “Better Regulation Toolkit”: European Commission (2015), Better Regulation “Toolbox”, available here http://ec.europa.eu/smart-regulation/index_en.htm

¹⁹ Adapted from the European Commission “Better Regulation Toolkit”: European Commission (2015), Better Regulation “Toolbox”, available here http://ec.europa.eu/smart-regulation/index_en.htm

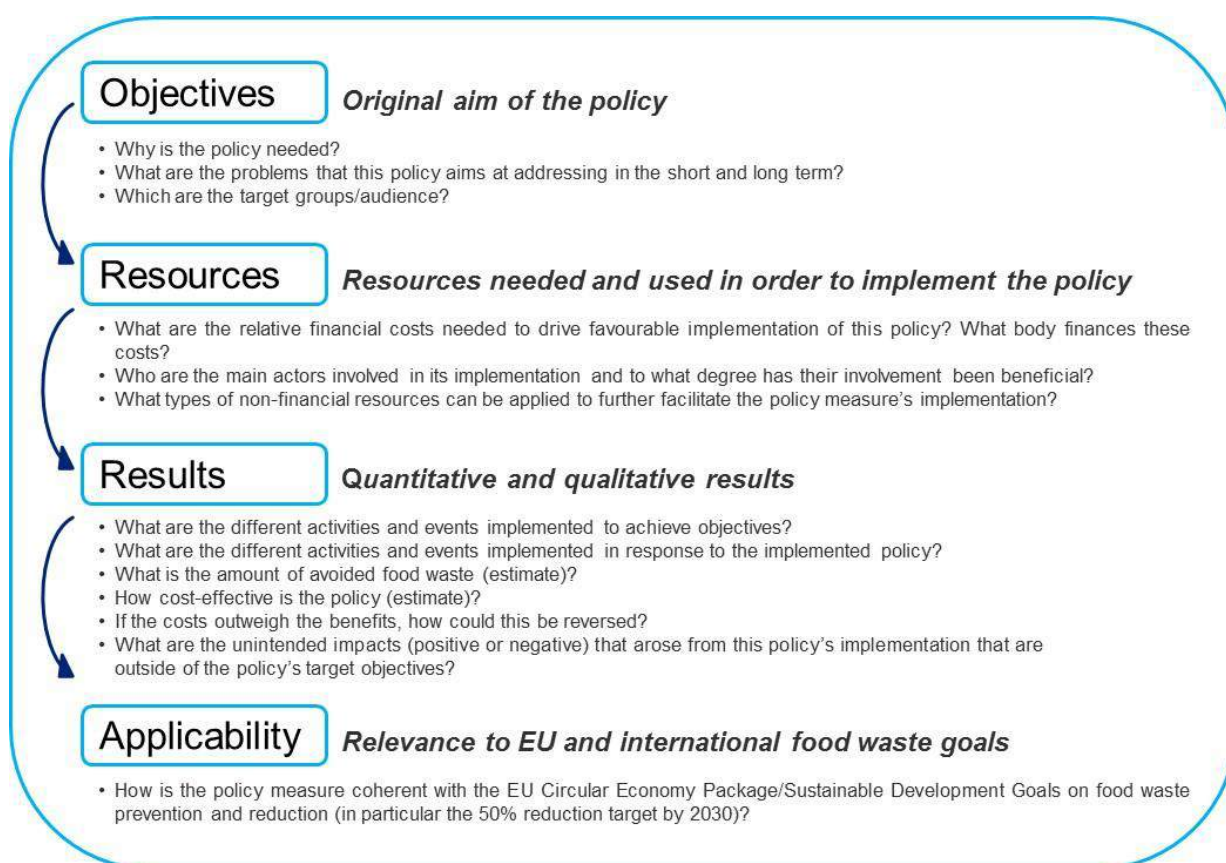
3 Setting the stage for the evaluation

By the end of this chapter, readers will:

- have a clear understanding of the evaluation categories;
- have an understanding of how to utilise the “Four-Axe Diagnostic” presented below to structure and carry out initial brainstorming;
- have access to baseline questions to orient an evaluation’s diagnostic; and
- understand at what stage to identify data gaps that will be needed to address along with potential sources or actors that can help unblock foreseen data barriers.

A properly designed evaluation begins with carrying out a preliminary analysis of the policy in question. Policy makers are encouraged to go about this task by completing the questions outlined in the Four-Axe Diagnostic, illustrated below.

Figure 2: Four-Axe Diagnostic, complete with its main *baseline* questions²⁰



²⁰ Scheme inspired from the European Commission's "Intervention Logic" scheme within the "Better Regulation Toolbox": European Commission (2015), Better Regulation "Toolbox", available here http://ec.europa.eu/smart-regulation/index_en.htm http://ec.europa.eu/smart-regulation/guidelines/docs/br_toolbox_en.pdf

The following are the axes presented within this diagnostic: identify the original **objectives** of the policy, consider the **resources** used to implement the policy, highlight the quantitative and qualitative **results**, and identify the **applicability** and relevance of the policy within the EU's food waste objectives.

Each axe is complete with a non-exhaustive list of **baseline** thought-provoking questions. These questions are intended to remain general in order to allow policy makers to begin brainstorming for any type of policy within a simple framework despite its complexity.

The policy maker should try to answer all of the aforementioned diagnostic questions as extensively as possible. Completing this exercise furthermore helps preliminarily identify any immediate data gaps. In parallel with **answering the baseline questions** within the abovementioned diagnostic, the policy maker shall **create a list of actors and sources** that could potentially provide the needed information, and match these actors to the missing data categories. If the policy maker is not able to identify potential sources or actors, this should also be pin-pointed. This list of actors and sources will be revisited in Chapter 5 "Conducting the Evaluation".

4 Structuring the evaluation

By the end of this chapter, readers will:

- understand the five evaluation criteria and their orienting questions;
- become familiarised with the proposed indicators and understand how to further develop the provided list;
- know how to select indicators, based on given parameters; and
- synthesise findings from data holes in Chapter 3 and prepare for data research.

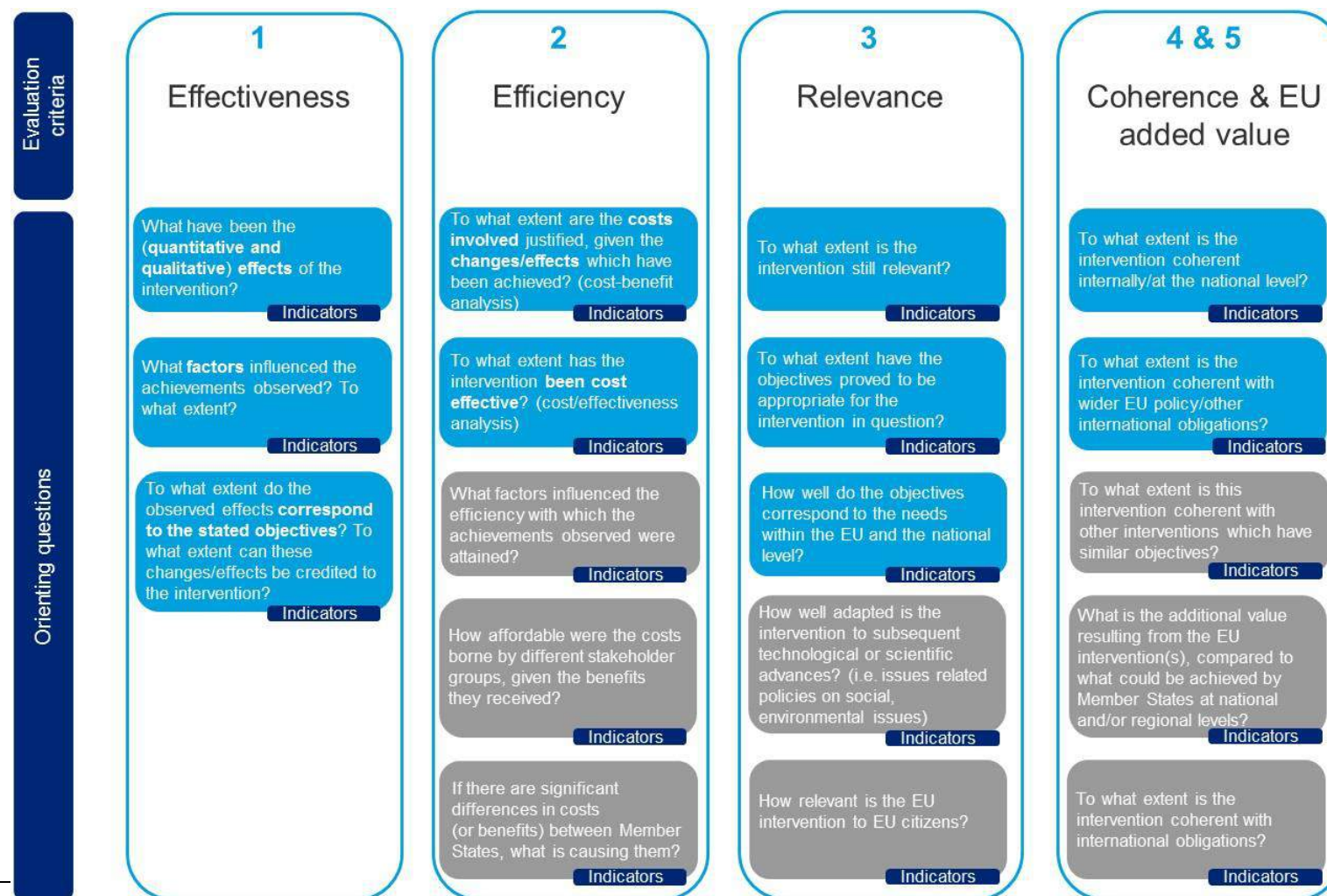
While the initial work completed in Chapter 3 provides the reader maker with a general background on evaluation frameworks, as well as an initial diagnostic tool (the Four-Axe Diagnostic) to set the stage for any evaluation, this chapter presents the framework to be used to carry out an evaluation.

This framework is set up in a hierarchical manner. As seen in the figure below, at the top of the framework's hierarchy are the **five evaluation criteria** from the EU's "Better Regulation Toolkit"²¹, which, according to the European Commission, are the key to carrying out successful evaluations. Each evaluation criterion is split into various *example non-exhaustive orienting questions*, which categorise **indicators** per policy measure. The objective to organising indicators in this hierarchical manner is to facilitate structure and organisation within the evaluation. Further steps such as addressing data gaps are outlined later on in the document.

²¹ European Commission (2015), Better Regulation "Toolbox", available here http://ec.europa.eu/smart-regulation/index_en.htm

In the figure below, the example orienting questions in **blue** have been used in Chapter 5 for the development of indicators per policy measure. The orienting questions in **grey** are examples of additional questions, however specific indicators have not been drafted within this document.

Figure 3: The evaluation scheme: Evaluation criteria → orienting questions → indicators²²



²² Content adapted from the European Commission's "Better Regulation Toolbox" http://ec.europa.eu/smart-regulation/guidelines/docs/br_toolbox_en.pdf

4.1 Evaluation criteria & orienting questions

The figures below break down each of the five evaluation criteria presented above by providing definitions to and the objectives for each criterion's orienting questions. Contrarily to the selection of orienting questions in Figure 3, this figure only illustrates those (blue) orienting questions that have been used in Chapter 5 for the development of indicators per policy measure.

Figure 4: Explanations and definitions of “effectiveness” and “efficiency”

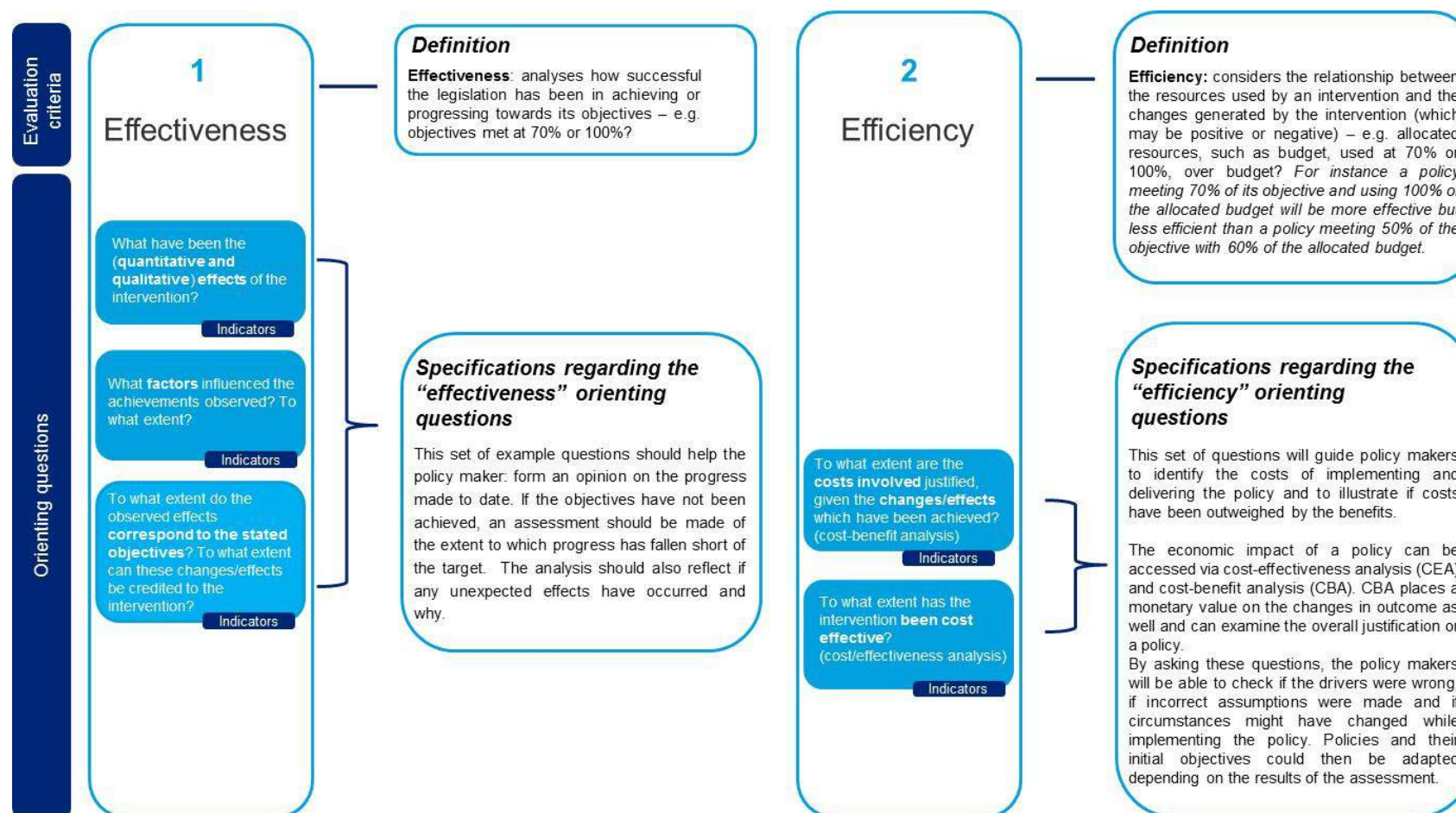
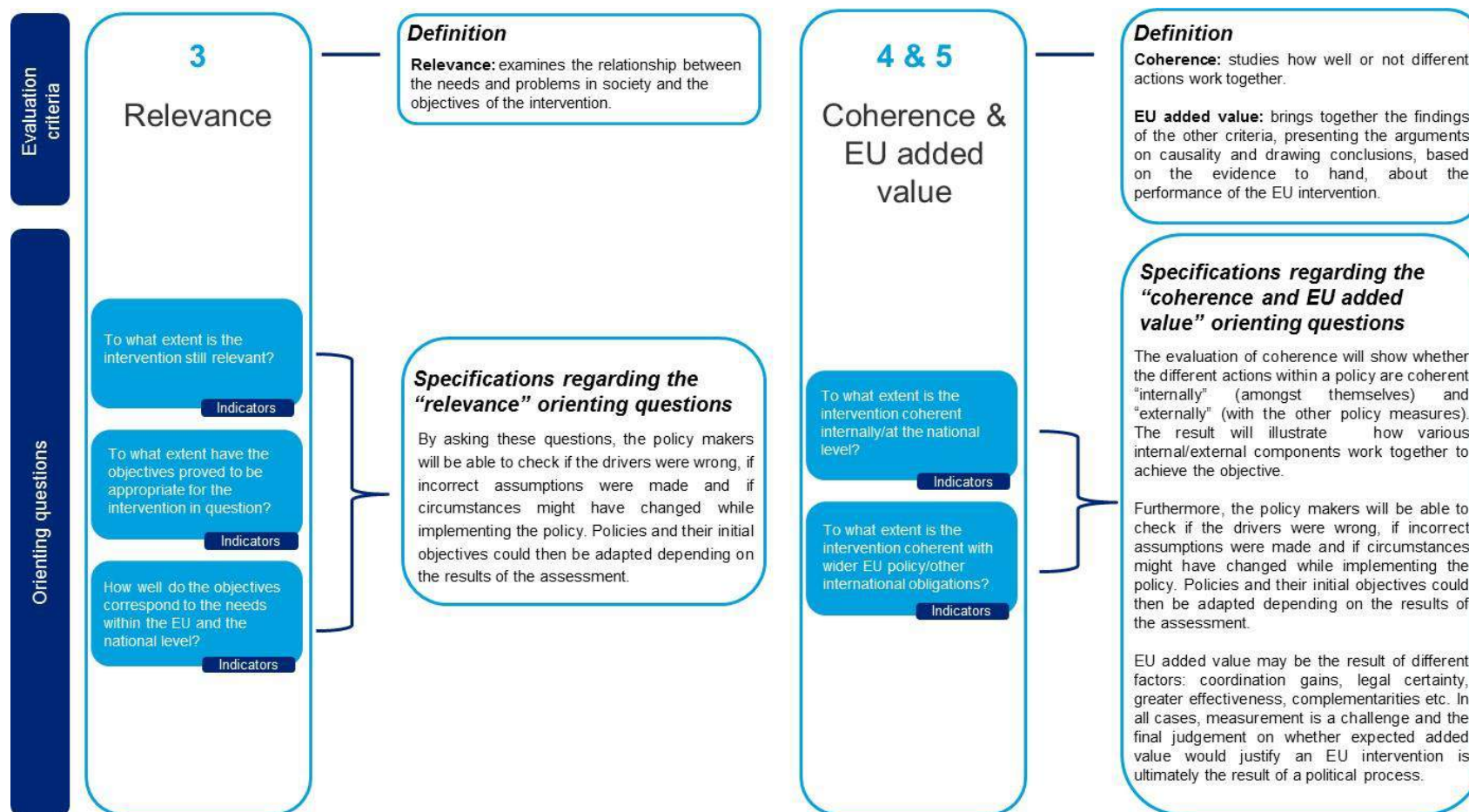


Figure 5: Explanations and definitions of “relevance” and “coherence & EU added value”



It should be noted that while Chapter 5 illustrates orienting questions and indicators that are adapted for each policy measure type, “coherence” and “EU added value” are excluded from the outlined case studies. Instead, a general approach is illustrated below, featuring two tables which provide examples on how to apply the orienting questions to specific pieces of legislation. Policy makers are encouraged to use these general examples to develop their own.

Coherence <i>To what extent is the intervention coherent internally/at the national level?</i>				
Legislative act	Related policy area	Description	Type of implication	Grade of coherence ²³
Example: Council Directive 2006/112/EC on the common system of value added tax	Example: Taxation	Example: This regulation lays down rules for the prevention, control, and eradication of certain transmissible spongiform encephalopathies	Example: This Regulation contains some measures targeted to reduce food waste. Regulation (EC) No 163/2009 states that the feeding to farmed animals with materials of plant origin and stuffs containing such products given the detection of insignificant amounts of bone spicules may be permitted by Member States if there has been a favourable risk assessment. The risk assessment shall take into account the amount and possible source of contamination and the final destination of the consignment	Example: -2 (in food labels “use by” ²⁴ should be substituted with “best before” ²⁵ , in order to allow commercialisation of food items near expiry date)

²³ The internal coherence among different policy sectors should be assessed by qualitative tools:

- Inventory of national legislation and policies with implications on food waste prevention, reduction, generation and optimization of food use;
- Identification of the different policy areas (agriculture, economic and monetary policy, industrial policy, social policy, taxation etc.) with implications on food waste prevention, reduction, generation and optimization of food use.

For every policy area, a grade from 2 (very coherent) to -2 (serious contradictions) should be assigned by the evaluators. In case of negative grades, minor (-1) or major (-2) revision will be suggested.

²⁴ A “use by date” is a limit date to consumption (should not be consumed after this date because of microbiological/health safety reasons).

²⁵ A “best before” date indicates the date until which certain properties of the product are fulfilled, although it may also be consumed after the indicated date.

At this stage, the Circular Economy Package is the only EU-wide policy that directly addresses and has objectives for reducing food waste across the EU. For this reason, it is the only example outlined below. The EU-added value criterion should be kept in mind for addressing EU food waste policies that may be developed in the future.

EU-added value <i>To what extent is the intervention coherent with wider EU policy/other international obligations?</i>		
EU legislation	Related topic/ Description of statutory provisions	Grade of coherence with current EU situation ²⁶
Example: Circular Economy Package	Example: Circular Economy Package adopted the September 2015 12.3 Sustainable Development Goal (SDG) food waste reduction target ²⁷ to halve per capita food waste at the retail and consumer levels by 2030 , and reduce food losses along the (food) production and supply chains, including post-harvest losses.	Example: 0 (At this stage, implementation is in the beginning stages, as it was adopted in late September 2015, therefore no pronounced conclusions can be determined).

²⁶ The coherence with different EU (or international) policies and legislations should be assessed by qualitative tools:

- Description of the national law/plan under assessment;
- Inventory and description of EU legislation concerning the same ruled topics.

For every policy topic/issue, a grade from 2 (coherence to EU added value) to -2 (contradiction to EU added value) should be assigned by the evaluators. In case of negative grade, a check is suggested.

²⁷ United Nations. Sustainable Development Goals, available here: <https://sustainabledevelopment.un.org/index.php?menu=1300>

4.2 Indicators

Moving down the hierarchy from the evaluation criteria in section 4.1, orienting questions that fit within the scope of each of the five evaluation criteria helps provide an umbrella to the wide-arrays of indicators specific to each policy type, detailed in Chapter 5.

Indicators are essential to a policy evaluation, as they are key tools that, when addressed/calculated, provide a clear, comparable measure of the impact of a policy.

Indicators can:

- identify how actors are affected by the policy measure in question;
- assess the impacts of a particular policy measure on food waste in qualitative and, if possible, quantitative and/or monetary terms (via cost effectiveness and cost-benefit analysis); and
- consider other social, environmental and economic impacts (positive impacts and potential trade-off effects).

4.2.1 Case study-specific indicators per policy measure

The case indicators outlined in Chapter 5 exemplify how to tailor indicators according to particular case studies within different policy measure categories. Tailoring indicators to a specific policy is vital to obtaining relevant conclusions. It should furthermore be kept in mind that the availability of data to assess different types of evaluations can vastly vary. This is highly dependent on the Member State in which the policy is being applied, as in certain cases food waste data are not comprehensively collected.

Low availability of quantitative information (on costs, food waste, economic or environmental impacts, etc.) to calculate results should *not* be a factor used to dismiss the relevance of any indicator. Rather, despite the fact that quantitative information may be difficult to obtain, all relevant indicators should be considered. At a later step in this Framework, data gaps will be addressed and the list of sources created in Chapter 3 will be developed. For those countries/regions in which data are deemed not available, the **Food Waste Quantification Manual**²⁸ provides a viable outlet to obtaining missing data.

As the provided framework of indicators is non-exhaustive and furthermore directly adapted to each of the presented case studies, guidance on how to self-develop indicators in the next section.

4.2.2 Self-developed indicators

Research shows that a solidly created indicator will reflect certain characteristics that contribute to its quality and relevance to the evaluated policy.

²⁸ Tostivint, C., Stenmarck, Å., Quested, T., et al. (2015), Food Waste Quantification Manual. <http://www.eu-fusions.org/phocadownload/Publications/Food%20waste%20quantification%20manual%20to%20monitor%20food%20waste%20amounts%20and%20progression.pdf>

Policy makers may use the below list²⁹ of characteristics to “test” a self-developed indicator by asking themselves if and how strongly the indicator possesses the aforementioned qualities:

- **Attainable**
 - *Definition: The measurement of the indicators should be achievable by the policy or project, and should be sensitive to the improvements the project/policy wishes to achieve.*
- **Clear**
 - *Definition: Indicators should effectively target the factor which they are measuring, and should avoid ambiguity and arbitrariness in the measurement.*
- **Comparable**
 - *Definition: The indicator measurement should enable comparison over the different life-cycle stages of the policy or project, as well as between different policies or projects.*
- **Comprehensible**
 - *Definition: The definition and expression of the indicator should be intuitively and easily comprehensible to users.*
- **Cost-effective**
 - *Definition: The cost of collecting and processing the data needed for the chosen indicators should be reasonable and affordable.*
- **Up to date**
 - *Definition: Indicator information should be as up to date as possible, to reflect current or recent circumstances. The impact of delays between collection and use should be considered and factored into the analysis, where necessary using extrapolation techniques.*
- **Measurable**
 - *Definition: Indicators should be defined so that their measurement and interpretation are as unambiguous as possible, preferably using data that is readily available, relevant, reliable and meaningful.*
- **Redundant**
 - *Definition: While each input variable should measure a discrete phenomenon, separate indicators that measure the same phenomenon may be necessary and desirable.*
- **Relevant**
 - *Definition: Indicators should be directly relevant to the issue being monitored or assessed, and should be based on clearly understood linkages between the indicator and the phenomena under consideration.*
- **Reliable**
 - *Definition: The results from an indicator should be replicable by different researchers using standard methods. The methods should be stable over time and as valid in as wide a circumstance as possible.*
- **Sensitive**
 - *Definition: Indicators should be able to reflect small changes in those things that the actions intend to change.*

Depending on the results of the test, the policy maker may choose to rethink and redraft the indicator. This list can furthermore be used to select indicators from the pre-defined list presented in the next section. It is recommended to perform this exercise multiple times for pre-selected as well as self-developed indicators to ensure the indicators absolute relevance to the policy.

²⁹ The United Nations Office for Disaster Risk Reduction (2008), Indicators of Progress: Guidance on Measuring the Reduction of Disaster Risks and the Implementation of the Hyogo Framework for Action", http://www.eird.org/country-profiles/profiles/index.php/Indicators_of_progress#Selecting_which_indicators_work_best_for_you

5 Conducting the evaluation: possible indicators developed from case studies

By the end of this chapter, readers will:

- see case studies of policy types;
- see examples of indicators, adapted per policy type;
- see examples of calculation methods, adapted per policy type.

This chapter aims at providing examples of the application of the above evaluation criteria and orienting questions to case studies for each type of policy measures – **communication/marketing campaigns, market-based instruments, national food waste prevention and reduction plans, projects and other measures, regulatory instruments, and voluntary agreements** – in order to develop an illustrative evaluation framework for each case study.

These case studies outline potential lists of non-exhaustive indicators which could be used by policy makers to evaluate a policy measure. It is recommended that policy makers follow a similar process to develop indicators according to the policy measure evaluated.

The following sections are organised by type of policy measure. Each section consists of tables that correspond to each of the evaluation criteria introduced previously, with the exception of **coherence** and **EU-added value** which are outlined at the end of Chapter 4. The orienting questions seen in Figure 3 divide the evaluation criteria presented below (**effectiveness, efficiency, relevance**) into separate tables in order to categorise the case-study specific indicators. Each table illustrates an indicator, its corresponding calculation method, potential data sources, and frequency of calculation.

5.1 Communication/marketing campaigns

5.1.1 Definition

EU FUSIONS has previously defined campaigns as national “umbrella” campaigns, short campaigns/festivals, retailers’ campaigns, education/training initiatives, contest/competitions. Communication could consist in seminars and lectures, vocational training books and manuals.

Such initiatives are normally launched by public bodies or governmental institutions, or in some cases NGOs, consumers’ organisations or retailers. In some minor cases they are part of the activities planned and structured in a project financed by European Institutions.

Examples of communication/marketing actions that could undergo evaluation are:

- Conferences/meetings/events/workshops;
- Articles/books;
- Social media campaigns;
- Media (television or radio);
- Website development;
- Etc.

5.1.2 Case study: Last Minute Market Italy

The indicators listed in the following section are tailored to the case study outlined below.

Last Minute Market’s³⁰ project mission is to create a network of retailers, shops, and producers in possession of food surplus to charities and individuals in need of food. This initiative helps cut down on food surplus that would otherwise be discarded. This Italian-originating project is currently active in more than 40 Italian towns and has two more project sites in Argentina and Brazil on its way.

In 2010, Last Minute Market and the Department of Agro-Food Sciences of the University of Bologna launched the communication campaign **“A year against food waste”** (*Un anno contro lo spreco*). The aim of this multiannual communication campaign is to **raise awareness among citizens, institutions and businesses on the causes and consequences of food waste**. The campaign targets different actors: general public, children, local, national and European institutions, and businesses. It includes a number of communications tools and initiatives such as publications, conferences and public meetings, theatrical performances, public lunches and dinners with recovered food products.

The following section applies some of the orienting questions presented in chapter 4 in order to identify relevant indicators to evaluate the Last Minute Market communication campaign. The proposed indicators will not illustrate the impact of the campaign in terms

³⁰ Last Minute Market. Website available here: http://www.lastminutemarket.it/media_news/english/

of food waste reduction, as the data will be very challenging to obtain. The selected indicators rather focus on evaluating the objective of the above communication campaign, which is **to increase awareness on the causes and consequences of food waste**.

5.1.2.1 Potential list of indicators in relation with the case study

Table set 1: Criterion - Effectiveness

Communication/marketing campaigns				
To what extent have the objectives been achieved? What have been the (quantitative) effects of the intervention?				
Objective	Indicator	Calculation method	Source of data	Frequency
Organise events/conferences public	Number of participants at public events	Entrance count of participants at event entrance or roster.	Event coordinators	Throughout the duration of the campaign
Publish press releases	Number of journalists at press releases events and number of press reviews	Sum of all press reviews and journalists present	Web scanning to find events or email alerts. Event roster to obtain data on journalists.	
Organise media actions	Number of television spreads	Sum of all television spreads on food waste or the event/campaign.	Campaign organisers, television monitoring.	
Organise media actions	Number of radio spreads	Sum of all radio spreads on food waste or the event/campaign.	Campaign organisers, radio monitoring.	
Publish and print flyers	Outreach of printed material (number of people reached)	Sum of people reached via print material (via website downloads and flyer distribution at events).	Campaign organisers.	
Publish flyers online	Outreach of digital material (number of people reached)	Sum of people reached by types of digital material regarding food waste or the event/campaign.	Campaign organisers, media monitoring.	
Develop website	Number of hits/visits on webpage	Sum and tracking of hits on the webpage during the campaign.	Campaign masters/organisers web	Before, throughout the campaign, and after.

Communication/marketing campaigns

To what extent have the objectives been achieved? What have been the (quantitative) effects of the intervention?

Objective	Indicator	Calculation method	Source of data	Frequency
Social media presence	Number of fans and followers on social networks	Number of followers, likes, tweets, impressions, shares, etc.	Social media analytic tools.	Before, throughout the campaign, and after.

Communication/marketing campaigns

To what extent do the observed effects correspond to the stated objectives? To what extent can these changes/effects be credited to the intervention?

Objective	Indicator	Calculation method	Source of data	Frequency
Organise media actions	Number of hits on websites and social media	Difference (quantity) of awareness before and after implementation of action	Statistics from websites (i.e. number of hits), surveys regarding how the awareness level of food waste was affected thanks to websites and social media, etc.	Periodic: before campaign/project/measure, midway, and after completion of action
Organise public events/conferences	Number of participants at events	Difference (quantity) of participation before and after implementation of action	Event coordinators	At the campaign's close
Develop wesbsite	Number of hits/visits on webpage	Difference between tracking of hits on the webpage at the beginning and end of the campaign	Campaign masters/organisers web	At the campaign's close

Communication/marketing campaigns

What factors influenced the achievements observed? To what extent did different factors influence the achievements observed?

Indicator	Calculation method	Source of data	Frequency
Number of television spreads that advertise food waste campaigns	Sum of all televisions spreads on food waste or the event/campaign.	Campaign organisers, television monitoring	Throughout the duration of the campaign
The scale of (national) coverage of the campaigns	Population reach divided by national population in order to obtain the total percentage of population reach	National statistics, Census, campaign organisers	At the end of the intervention
The number of sectors in the food supply chain covered by the campaign	Sum of types of different food supply chain sectors.	Campaign organisers	Throughout the duration of the intervention
The number of food chain actors actively participating in initiative/event	Number of companies and organisations	Campaign, event, or project leaders	Yearly
The number of charities collecting and distributing food surplus	Sum of food surplus donated (tonnages).	Retailer and charity/food bank internal data	Throughout the duration of the intervention
The financial cost of the intervention	Sum of all costs related to the intervention	Campaign organisers, financial statements	At the end of the intervention
The lasting effects of the initiative (i.e. what level of long-term implementation is observed or expected?)	Questionnaires and progress surveys analysis	Questionnaires or progress surveys taken during and after the course of the intervention, campaign organisers	At the end of the intervention
Local media actions which influence campaign uptake	The sum of local media actions indirectly or directly related to food waste.	Local authorities, media monitoring	Before and after campaign
The timeliness and strategy of media distribution		Campaign coordinators	Throughout the duration of the intervention

Table set 2: Criterion - *Efficiency*

Communication/marketing campaigns			
<i>To what extent has the intervention been cost effective? (Cost/effectiveness analysis)</i>			
Indicator	Calculation method	Source of data	Frequency
Total annual direct costs related to: administration, advertising, funding, equipment, material, workshops, website development etc.	Annual sum of all costs related to the implementation of the communication/marketing campaign in relation to the total allocated budget	Campaign organisers, financial statements	At the end of the intervention

Communication/marketing campaigns			
<i>To what extent are the costs (qualitative) involved justified, given the changes/effects which have been achieved? (cost-benefit analysis)</i>			
Indicator	Calculation method	Source of data	Frequency
Direct costs vs increased number of citizens aware of food waste consequences	A qualitative assessment of whether the final result justifies the costs involved.	Campaign organisers, financial statements and all the above.	At the end of the intervention

Table set 3: Criterion - Relevance

Communication/marketing campaigns			
<i>To what extent have the objectives proved to be appropriate for the intervention in question?</i>			
Indicator	Calculation method	Source of data	Frequency
Relevance of communication instruments used (outreach per communication instrument)	Total number of contacts per capita: number of hits to the dedicated website (if relevant), number of calls received to the dedicated phone number (if relevant), and number of received emails to the dedicated generic project email (if relevant).	Statistics of the national food plan authority	Every three months
Stakeholder involvement	Share of stakeholders involved in each intervention out of the total number of targeted stakeholders (schools, food shops, food producers, etc.)	Administrative databases	Yearly after campaign launch

5.2 Market-Based Instruments

5.2.1 Definition

EU FUSIONS defines **market-based instruments** as policy tools that encourage behavioural change through market signals, namely by providing economic incentives, rather than through traditional regulations; where (a) economic incentive is defined as “an inducement or supplemental reward that serves as a motivational device for a desired action or behaviour”; (b) policy is defined as “actions undertaken by governments and public authorities and organisations such as regulations/legislations, governmental subsidies and support actions, private initiatives”.

Examples of market based instruments that could undergo evaluation are:

- Labelling schemes;
- Taxation schemes;
- Etc.

5.2.2 Case study: Certification and labelling schemes

The indicators listed in the following section are tailored to the case study outlined below.

Certification and labelling schemes (mandatory or voluntary) that operate within a supply chain (business-to-business (B2B) and business-to-consumers (B2C)) are important market-based policy making opportunities.³¹

Chain actors (producers, retailers and food services) might be certified according to their practices on how they prevent and reduce food waste and how they achieve a certain level of food waste reduction. These can be a practice- or outcome-based schemes. Products made entirely according to certified schemes can be labelled.

For example, an “ecolabel on food waste reduction”, or “less food waste” or “food waste minimiser” could be launched, although it does not exist.

The advantages of food waste certification are as follows:

- “Good” and “bad” companies can be clearly distinguished;
- A label can be motivating for a company to start measuring and implementing policies/processes; and
- Certification can be a basis for a good public procurement policy for food waste reduction.

³¹ Market-based Instruments and Other Socio-economic Incentives Enhancing Food Waste Prevention and Reduction Report from EU FUSIONS project, expected to be published in 2016. Available here: <http://www.eu-fusions.org/index.php/publications>

Different existing schemes could provide a model on how to include food waste prevention and reduction into all food production processes. The European Commission's inventory of agricultural labels comprises 441 agriculture-related labelling schemes, which cover a wide range of issues (Areté, 2010).³² Although none of the schemes in the agri-label database relate directly to food waste, there are 54 schemes that relate to the sustainable use of resources; and some of them could potentially include food waste.

The aim of the scheme is to evaluate the extent to which a practice/product prevents and reduces food waste; and the extent to which a practice/product effects environment, social and economic issues. That is, the scheme must be able to identify which practices/products contribute more and less to food waste prevention and reduction, allowing the more contributing practices/products to be certified/labelled.

For the purpose of this exercise, the following indicators are tailored to this currently non-existent environmental labelling scheme on food waste: "food waste reduction", or "less food waste" or "food waste minimiser" ecolabel.

³² Arété (2010): Inventory of Certification Schemes for Agricultural products and Foodstuffs Marketed in the EU Member States, report for the European Commission, online available: http://ec.europa.eu/agriculture/quality/certification/inventory/inventory-dataaggregations_en.pdf

5.2.2.1 Potential list of indicators in relation with the case study

Table set 4: Criterion - *Effectiveness*

<i>Market-based instruments</i>				
<i>To what extent have the objectives been achieved? What have been the (quantitative) effects of the intervention?</i>				
Objective	Indicator ³³	Calculation method	Source of data	Frequency
Identify food waste avoidance within the food industry via the application of food waste label criteria	Percent of food waste avoided	Variation in the percentage of food waste as a share of total national food production from year <i>t-1</i> to year <i>t</i>	Data from ecolabel certification organisation, national data	Yearly after implementation of food waste ecolabel criteria
	Quantity of food waste avoided	Difference between the quantity of food waste (metric tonnes) within supply chain in years <i>t</i> and <i>t-1</i> ¹		
	Monetary savings due to food waste avoided including any investment to new food waste technology	Difference between the monetary value of wasted food (Euros) in years <i>t</i> and <i>t-1</i> in comparison to the return on investment via new technology purchase		
	Quantity of CO₂ emission reduction due to food waste avoided	Ratio of the reduction of CO ₂ emissions (metric tonnes) thanks to enhanced food supply chain practices in line with food waste ecolabel ³⁴		
	Amount of avoidable food waste still occurring in the supply chain after implementation of food waste ecolabel criteria	Sum of edible food (tonnes) within supply chain minus food surplus (comprising all steps in the food supply chain)	Data from ecolabel certification organisation	Annually

³³ Other indicators that are not applicable to this case study, however that could be applied to other policies are: food waste reduction (percent, quantity, monetary) in primary pre-harvest production, primary post-harvest production, wholesale/retail, etc.

³⁴ For a more detailed methodology for environmental assessment, please refer to EU FUSIONS deliverable "Criteria for and baseline assessment of environmental and socio-economic impacts of food waste"

Market-based instruments

To what extent have the objectives been achieved? What have been the (quantitative) effects of the intervention?

Objective	Indicator ³³	Calculation method	Source of data	Frequency
Identify the reach of targeted stakeholders within industry	Quantity of industry actors within the food supply chain that obtained the food waste ecolabel	Evolution of total number of companies in years n- and n-1 that obtained the food waste ecolabel	Data from ecolabel certification organisation	Before implementation of food surplus redistribution programme and yearly following its implementation
Identify awareness levels of benefits of food waste ecolabel	Number of companies within the food supply chain aware of the food waste ecolabel	Sum of all actors aware of food waste ecolabel	Data from questionnaires and surveys conducted by ecolabel certification organisation	Bi-annually after implementation of food waste ecolabel criteria

Market-based instruments

What factors influenced the achievements observed? To what extent did different factors influence the achievements observed?

Objective	Indicator	Calculation method	Source of data	Frequency
Identify the effectiveness in promoting the food waste ecolabel	Number of media spreads that advertise the food waste reduction benefits linked to the food waste ecolabel	Sum of all media spreads vs increased support at the local, regional, national level	Regional and national event pages and campaigns	Yearly after implementation of food waste ecolabel criteria
	The scale of (national) coverage of the food waste ecolabel	Population reach divided by national population in order to obtain the total percentage of population reach on industrials and consumers	National statistics, data from ecolabel certification organisation	Yearly after implementation of food waste ecolabel criteria

Table set 5: Criterion - Efficiency

<i>Market-based instruments</i>				
To what extent has the intervention been cost effective? (Cost/benefit analysis)				
Objective	Indicator	Calculation method	Source of data	Frequency
Cost-benefit of ecolabelling scheme	Increased demand for external certification bodies (performing audits on companies with food waste ecolabel)	Total number of mobilised certification bodies	Data from ecolabel certification organisation and external third party auditors	Yearly after implementation of food waste ecolabel criteria
	Cost-benefit of certification bodies performing audits on companies with food waste ecolabel	Difference between resources spent to carry out audits/verification versus payment received from certified companies	Data from ecolabel certification organisation and external third party auditors	Yearly after implementation of food waste ecolabel criteria
	Labour variation for certified company	Ratio of the number of working hours necessary to implement the food waste ecolabel criteria and the number of working hours	Data from certified company	Yearly after implementation of food waste ecolabel criteria
	Environmental efficiency of certified company	Ratio of the reduction of greenhouse gas emissions (metric tonnes) thanks to application of food waste ecolabel criteria ³⁵	Data from ecolabel certification organisation, external third party auditors, and certified organisation	Yearly after implementation of food waste ecolabel criteria
	Social efficiency of certified company	Ratio of the total number of kilocalories recovered from avoided food waste via the certified company's application of criteria ³⁶	Data from ecolabel certification organisation, external third party auditors, and certified organisation	Yearly after implementation of food waste ecolabel criteria

³⁵ For a more detailed methodology for environmental assessment, please refer to EU FUSIONS deliverable "Criteria for and baseline assessment of environmental and socio-economic impacts of food waste"

³⁶ For a more detailed methodology for social assessment, please refer to EU FUSIONS deliverable "Criteria for and baseline assessment of environmental and socio-economic impacts of food waste"

Table set 6: Criterion – Relevance

<i>Market-based instruments</i>				
To what extent have the objectives proved to be appropriate for the intervention in question?				
Objective	Indicator	Calculation method	Source of data	Frequency
Applicability of food waste ecolabel	Relevance of communication instruments used by certification body (outreach per communication instrument)	Total number of contacts per capita: number of hits to the dedicated website (if relevant), number of calls received to the dedicated phone number (if relevant), and number of received emails to the dedicated generic project email (if relevant).	Data from ecolabel certification organisation, external third party auditors, and certified organisation	Every month after implementation of communication instrument

<i>Market-based instruments</i>				
How well do the objectives correspond to the needs within the EU and the national level?				
Objective	Indicator	Calculation method	Source of data	Frequency
Relevance to EU targets	Reduction of food waste due to implementation of food waste ecolabel criteria in relation to the national or EU food waste reduction goal ³⁷	Ratio of food waste reduction impact in relation to the 2030 50% Sustainable Development reduction goal/EU Circular Economy Package goal	Data from ecolabel certification organisation, external third party auditors, and certified organisation	Yearly after implementation of food waste ecolabel criteria
	Reduction in national CO ₂ emissions in comparison to the EU target	The ratio of CO ₂ emission reduction thanks to application of food waste ecolabel criteria across the food supply chain in the reference year compared to former years.	Data from ecolabel certification organisation, external third party auditors, and certified organisation	Yearly after implementation of food waste ecolabel criteria

³⁷ As of December 2015, the European Commission's new Circular Economy package indicates that the EU-wide food waste target shall be in line with the United Nations General Assembly adopted Sustainable Development Goals for 2030 (target to halve per capita food waste at the retail and consumer levels and reduce food losses along production and supply chains). http://europa.eu/rapid/press-release_MEMO-15-6204_en.htm

5.3 National Food Waste Prevention and Reduction Plans

5.3.1 Definition

National Food Waste Prevention and Reduction Plans are general documents approved by national governments, which set the principles for addressing this issue. Despite the existence of the EC Waste Framework Directive, they do not have a common structure: they might be part of a more general national waste prevention/management plan, be designed as an autonomous plan specifically addressing food waste prevention and reduction, be included within several sectorial documents. They generally foresee a set of different actions including tools and measures as market-based instruments, regulations and regulatory instruments, voluntary agreements, technical reports, communication strategies and campaigns, projects.

Examples of market based instruments that could undergo evaluation are:

- National Food Waste Prevention and Reduction Plans;
- Regulations and regulatory instruments;
- Etc.

5.3.2 Case study

The indicators listed in the following section are tailored to the case study outlined below.

National policies, strategies, and plans (NPSPs) play an essential role in defining a country's vision, priorities, budgetary decisions and course of action to reach specific goals (i.e. food security, social welfare). They represent a central element to give direction and coherence and to foster a holistic and overarching approach in the implementation of sets of different actions aimed at reaching a common goal. NPSPs are usually established through an inclusive policy dialogue and are characterised by (i) specific tasks and activities identifying clear roles, responsibilities and coordination mechanisms, (ii) a time horizon, (iii) a clear budget allocating funds to specific activities, and (iv) specific monitoring and evaluation tools (World Health Organization, 2011; United Nations Environment Programme, 2013).

Due to the specific characteristics of NPSPs monitoring and evaluation tools should include indicators assessing both their specific implementation (overall impact, effectiveness, efficiency, coherence, relevance) but also the performances of the tools and measures aimed to contribute to reach the overall target.

5.3.2.1 Potential list of indicators in relation with the case study

Table set 7: Criterion - *Effectiveness*

National Food Waste Prevention and Reduction Plans				
To what extent have the objectives been achieved? What have been the (quantitative) effects of the intervention?				
Objective	Indicator ³⁸	Calculation method	Source of data	Frequency
Identify food waste avoidance within the food industry via the plan's implementation	Percent of food waste avoided	Variation in the percentage of food waste as a share of total national food production from year $t-1$ to year t	National and imports/exports statistics, process monitoring (i.e. percentage of household food waste collected by local authorities from $t-1$ to year t)	Yearly after approval of the plan
	Quantity of food waste avoided	Difference between the quantity of food waste (metric tonnes) within supply chain in years t and $t-1$	National statistics, process monitoring (i.e. tonnage of household food waste collected by local authorities from $t-1$ to year t)	
	Monetary savings due to food waste avoided including any investment to new food waste technology	Difference between the monetary value of wasted food (Euros) in years t and $t-1$ in comparison to the return on investment via new technology purchase	National statistics, process monitoring	
	Quantity of CO₂ emission reduction due to food waste avoided	Ratio of the reduction of CO ₂ emissions (metric tonnes) thanks to enhanced food supply chain practices in line with plan's implementation ³⁹	Regional, national statistics, process monitoring, EU FUSIONS D1.6 Impact of food waste	
	Amount of avoidable food waste still occurring in the supply chain after plan's implementation	Sum of edible food (tonnes) within supply chain minus food	National statistics, process monitoring	

³⁸ Other indicators that are not applicable to this case study, however that could be applied to other policies are: food waste reduction (percent, quantity, monetary) in primary pre-harvest production, primary post-harvest production, wholesale/retail, etc.

³⁹ For a more detailed methodology for environmental assessment, please refer to EU FUSIONS deliverable "Criteria for and baseline assessment of environmental and socio-economic impacts of food waste"

National Food Waste Prevention and Reduction Plans

To what extent have the objectives been achieved? What have been the (quantitative) effects of the intervention?

Objective	Indicator ³⁸	Calculation method	Source of data	Frequency
		surplus (comprising all steps in the food supply chain)		

National Food Waste Prevention and Reduction Plans

To what extent do the observed effects correspond to the stated objectives? To what extent can these changes/effects be credited to the intervention?

Indicator	Calculation method	Source of data	Frequency
Complying with the target	Share of food waste reduction (quantity) achieved during that year with respect to the national target of food waste reduction stated in the plan (quantity); if a national target is missing, the EU one will be used	National statistics	Yearly after the approval of the plan
Trends of food waste reduction	Percent difference between the food waste reduction achieved in the reference year and the food waste reduction achieved in the year before the approval of the plan $(FWR-t-FWR-t-1)/FWR-t$. ⁴⁰	National plan and national statistics	
EU-level comparison of food waste reduction	Ratio of the food waste reduction (per cent) achieved in the country in the reference year and the average food waste reduction (percent) achieved in EU Member States in the same year	National statistics, Eurostat	Yearly after the approval of the plan
Effectiveness of specific interventions listed in the plan	Average food waste reduction (percentage) achieved in EU Member States following the implementation of the plan.	National statistics, stakeholder consultations with national contact in charge of plan ⁴¹ , EU FUSIONS D1.6 Impact of food waste	Yearly after the approval of the plan

⁴⁰ FWR : Food Waste Reduction

⁴¹ Stakeholder consultations will facilitate data viability.

National Food Waste Prevention and Reduction Plans

What factors influenced the achievements observed? To what extent did different factors influence the achievements observed?

Indicator	Calculation method	Source of data	Frequency
Policy level covered	Qualitative evaluation: listing the administrative levels covered by the provisions of the plan	National plan and application decrees	Once, after approval
Levels of food supply chain covered	Share of levels of the food supply chain covered (every level will be weighted according to the share of food waste produced by it in the year preceding approval)	National plan and national statistics	Once, after approval
Effect of awareness raising events	Ratio of the monetary value of the reduced food waste achieved during a specific year and the number of awareness raising events organised during that year	National statistics, process monitoring	Yearly after approval of the plan
Effect of education campaign	Share of the school population (number of students) which had at least one hour of lecture about food waste during the school year	Databases of the school districts	Yearly after approval of the plan

Table set 8: Criterion - Efficiency

<i>National Food Waste Prevention and Reduction Plans</i> To what extent has the intervention been cost effective? (Cost/effectiveness analysis)			
Indicator	Calculation method	Source of data	Frequency
Expenditure ⁴² /reduction ratio	Ratio of the total annual cost of the national plan measures and the monetary value of the reduced food waste during the same year	National statistics, process monitoring	Yearly after approval of the plan
Labour variation	Ratio of the number of working hours necessary for implementing the plan measures and the number of working hours necessary for producing the food which was wasted during the same year	National statistics, process monitoring	Yearly after approval of the plan
Environmental efficiency	Ratio of the reduction of CO ₂ emissions (metric tonnes) thanks to reduced waste and the total annual cost of the national plan measures in the same year ⁴³	National statistics, process monitoring	Yearly after approval of the plan
Social efficiency	Ratio of the total number of kilocalories recovered thanks to reduced food waste and the total cost of the national plan measures in the same year ⁴⁴	National statistics, process monitoring	Yearly after approval of the plan

⁴² A significant expenditure may be considered either positive or negative: positive because it could represent a proxy of government's engagement in food waste reduction, negative because it could suggest that additional resources (different from food) are wasted, and food waste reduction is thus becoming a self-fuelling business.

⁴³ For a more detailed methodology for environmental assessment, please refer to EU FUSIONS deliverable "Criteria for and baseline assessment of environmental and socio-economic impacts of food waste"

⁴⁴ For a more detailed methodology for social assessment, please refer to EU FUSIONS deliverable "Criteria for and baseline assessment of environmental and socio-economic impacts of food waste"

National Food Waste Prevention and Reduction Plans

To what extent are the costs (qualitative) involved justified, given the changes/effects which have been achieved?

Indicator category	Indicator	Calculation method	Source of data	Frequency
Expenditure ⁴⁵ / reduction ratio	Primary production (pre-harvest)	Ratio of the total annual cost of the national plan measures and the monetary value of the reduced food waste during the same year	National statistics, process monitoring	Yearly after approval of the plan
	Primary production (for/post-harvest)			
	Processing and manufacturing			
	Wholesale, retail, marketing			
	Food preparation (food services)			
	Food consumption (household)			
Labour variation	Primary production (pre-harvest)	Ratio of the number of working hours necessary for implementing the plan measures and the number of working hours necessary for producing the food which was wasted during the same year	National statistics, process monitoring	Yearly after approval of the plan
	Primary production (for/post-harvest)			
	Processing and manufacturing			
	Wholesale, retail, marketing			
	Food preparation (food services)			
	Food consumption (household)			
Environmental efficiency	Primary production (pre-harvest)	Ratio of the reduction of CO ₂ emissions (metric tonnes) thanks to reduced waste and the total annual cost of the national plan measures in the same year	National statistics, process monitoring	Yearly after approval of the plan
	Primary production (for/post-harvest)			
	Processing and manufacturing			
	Wholesale, retail, marketing			
	Food preparation (food services)			
	Food consumption (household)			
Social efficiency	Primary production (pre-harvest)	Ratio of the total number of kilocalories recovered thanks to reduced food waste and the total cost of the national plan measures in the same year	National statistics, process monitoring	Yearly after approval of the plan
	Primary production (for/post-harvest)			
	Processing and manufacturing			
	Wholesale, retail, marketing			
	Food preparation (food services)			
	Food consumption (household)			

⁴⁵ A significant expenditure may be considered either positive or negative: positive because it could represent a proxy of government's engagement in food waste reduction, negative because it could suggest that additional resources (different from food) are wasted, and food waste reduction is thus becoming a self-fuelling business.

Table set 9: Criterion - Relevance

National Food Waste Prevention and Reduction Plans <i>To what extent is the intervention still relevant?</i>			
Indicator	Calculation method	Source of data	Frequency
Territorial relevance	Share of population living within local administrative areas (NUTS3) which applied the provisions of the national plan (if they need to be applied locally)	National administrative data	Yearly after approval of the plan
Citizens' awareness	Percentage of citizens who are aware of the existence of the National Strategy (calculated on a sample)	CATI survey	Every three months
Adoption by the retail sector	Share of the selling surface of food shops which adopted a strategy for recovery of unsold food out of total selling surface of food shops at national level	Databases of big retail companies	Yearly after approval of the plan
Perception of relevance of food waste	Percentage of citizens who think that food waste is a relevant issue compared to other issues (terrorism, unemployment, etc.) (calculated on a sample)	CATI survey	Every three months
Environmental relevance	CO ₂ emissions reduction thanks to food waste reduction from years $t-1$ to year t , per capita	National statistics, process monitoring	Yearly after approval of the plan
Social relevance	Kilocalories saved thanks to food waste reduction from years $t-1$ to year t , per capita	National statistics, process monitoring	Yearly after approval of the plan

National Food Waste Prevention and Reduction Plans

To what extent have the objectives proved to be appropriate for the intervention in question?

Indicator	Calculation method	Source of data	Frequency
Stakeholder involvement	Share of stakeholders involved in each intervention out of the total number of targeted stakeholders (schools, food shops, food producers, etc.)	Administrative databases	Yearly after approval of the plan
Reduction in national food waste quantities in comparison to the EU target	National food waste reduction in t minus $t-1$ (or other baseline year) in comparison to EU target	National statistics	Yearly after approval of the plan

National Food Waste Prevention and Reduction Plans

How well do the objectives correspond to the needs within the EU and the national level?

Indicator	Calculation method	Source of data	Frequency
Environmental achievements	CO ₂ emission reduction thanks to food waste reduction in the reference year as a share of the CO ₂ emission reduction required by the most relevant international documents	National statistics, international law	Yearly after approval of the plan
Social poverty achievements	Number of recovered kilocalories thanks to food waste reduction in the reference year per undernourished person at national level	National statistics	Yearly after approval of the plan

5.4 Projects and other measures

5.4.1 Definition

Projects and other measures refer to initiatives such as: neighbourhood projects, food sharing platforms and networks, labelling, applications, which contribute to and/or are connected to food waste reduction.

Examples of projects and other measures that could undergo evaluation are:

- Food sharing initiatives;
- Food banks;
- Etc.

5.4.2 Case study: Children Education

The indicators listed in the following section are tailored to the case study outlined below.

The objectives of children educational activities are:

- awareness raising; and
- reduction of household food waste (behaviour change).

In **Finland**, "Älä Jätä" ("Don't waste") is a programme where first grade students learn how to change their behaviours to reduce food waste and improve energy and water management.

In **Germany**, the Modul Wertschätzung und Verschwendung von Lebensmitteln (Module appraisal and wasting of food)⁴⁶ proposes 26 components on how to incorporate food waste into school lesson plans. The components include topics such as "meat consumption in the past and present", and "what happens with the food that we do not eat?" Some German States plan to include education on food waste prevention into their curricula.

As of 1995 in **Greece**, Eco-schools aim to evoke eco-behaviour in students formulating and implementing an "Eco-code" (a set of environmental and social rules), and by implementing an Environmental Action Plan aimed at addressing the environmental and social needs of the school district.

In **Spain**, some Catalan schools are committed to reducing food waste. The school Segimon Comas from the village of Sant Quirze Besora near Barcelona, represents an interesting case, since the school facilitated a food waste reduction programme that was furthermore applied to the school's village. These school educational programmes, paired with school dining services actions to reduce waste are to be considered for the below indicators.

⁴⁶ Issued by the University of Paderborn and the Verbraucherzentrale Nordrhein-Westfalen (Consumer Advice Centre North-Rhine/ Westphalia) on behalf of the Ministry for Climate Protection, Environment, Agriculture, Nature Conservation and Consumer Protection of the German State of North Rhine-Westphalia.

5.4.2.1 Potential list of indicators in relation with the case study

Table set 10: Criterion - *Effectiveness*

Projects and other measures

To what extent have the objectives been achieved? What have been the (quantitative) effects of the intervention?

Objective	Indicator ⁴⁷	Calculation method	Source of data	Frequency
Identify food waste avoidance within elementary schools (as a direct effect of the policy) and within households (as an indirect effect attributed to an application and of taught food waste practices by the child at home)	Percent of food waste avoided in school dining services	Variation in the percentage of food waste as a share of total national food production from year <i>t-1</i> to year <i>t</i> .	Regional, national statistics, process monitoring, EU FUSIONS D1.6 Impact of food waste	Yearly after implementation of child education programme
	Percent of food waste avoided in households			
	Quantity of food waste avoided in school dining services	Difference between the quantity of food waste (metric tonnes) in years <i>t</i> and <i>t-1</i>		
	Quantity of food waste avoided in households			
	Monetary savings due to food waste avoided in school dining services	Difference between the monetary value of wasted food (Euros) in years <i>t</i> and <i>t-1</i>		
	Monetary savings due to food waste avoided in households			
	Quantity of CO₂ emission reduction due to food waste avoided in school dining services	Ratio of the reduction of CO ₂ emissions (metric tonnes) thanks to reduced waste and the total annual cost of the national plan measures in the same year ⁴⁸		
	Quantity of CO₂ emission reduction due to food waste avoided in households			
Identify the reach of targeted stakeholders included within food waste educational programme	Quantity of children/respective families/teachers/school staff involved in educational programme	Evolution of total number of children/respective families/teachers/school staff involved in educational programme in years <i>t</i> and <i>t-1</i>	Statistics from school systems on inscription rates at school, teacher count, and number of family members per student	Before implementation of food waste educational programme and yearly following its implementation
Identify educational efforts made to spread awareness of food	Number of internal workshops put on for school children and	Sum of all workshops related to the food supply chain in relation	Statistics from school systems, local authorities for food waste	Periodic, whenever new workshops are launched

⁴⁷ Other indicators that are not applicable to this case study, however that could be applied to other policies are: food waste reduction (percent, quantity, monetary) in primary pre-harvest production, primary post-harvest production, wholesale/retail, etc.

⁴⁸ For a more detailed methodology for environmental assessment, please refer to EU FUSIONS deliverable "Criteria for and baseline assessment of environmental and socio-economic impacts of food waste"

Projects and other measures

To what extent have the objectives been achieved? What have been the (quantitative) effects of the intervention?

Objective	Indicator ⁴⁷	Calculation method	Source of data	Frequency
waste facts to school children and relevant stakeholders	teachers/relevant families	to a reduction in food waste post-ceding workshop	figures, planned workshops, and the EU actions against food waste platform	
Identify the implementation of school educational programs on different levels	Number of local, regional, national, and EU-wide school food waste educational programmes	Sum of projects	EU FUSIONS Deliverable: National Country Report, National ministry of environment page, regional & local statistics,	Biannually

Projects and other measures

What factors influenced the achievements observed? To what extent did different factors influence the achievements observed?

Objective	Indicator	Calculation method	Source of data	Frequency
Identify the effectiveness in promoting food waste educational programmes via media	Number of media spreads that advertise food waste educational programmes	Sum of all media spreads vs increased support at the local, regional, national level	Regional and national event pages and campaigns	Throughout the duration of the campaign
	The scale of (national) coverage of the campaigns	Population reach divided by national population in order to obtain the total percentage of population reach on educational programmes	National statistics, Census, campaign organisers	At the end of the intervention

Table set 11: Criterion - *Efficiency*

<i>Projects and other measures</i>				
To what extent has the intervention been cost effective? (Cost/benefit analysis)				
Objective	Indicator	Calculation method	Source of data	Frequency
Identify if the programme's financial cost is staying within the parameters of the allocated budget	Expenditure ⁴⁹ /reduction ratio	Ratio of the total annual cost of the school programme and the monetary value of the reduced food waste during the same year at the school in question/within the school district	School district statistics, National statistics, process monitoring	Yearly after approval of the school programme
	Labour variation	Ratio of the number of working hours necessary for implementing the plan measures and the number of working hours necessary for producing the food which was wasted during the same year	School district statistics, National statistics, process monitoring	Yearly after approval of the school programme
	Environmental efficiency	Ratio of the reduction of CO ₂ emissions (metric tonnes) thanks to reduced waste and the total annual cost of the school programme in the same year ⁵⁰	School district statistics, National statistics, process monitoring	Yearly after approval of the school programme
	Social efficiency	Ratio of the total number of kilocalories recovered thanks to reduced food waste and the total cost of the school programme in the same year ⁵¹	School district statistics, National statistics, process monitoring	Yearly after approval of the school programme

⁴⁹ A significant expenditure may be considered either positive or negative: positive because it could represent a proxy of government's engagement in food waste reduction, negative because it could suggest that additional resources (different from food) are wasted, and food waste reduction is thus becoming a self-fuelling business.

⁵⁰ For a more detailed methodology for environmental assessment, please refer to EU FUSIONS deliverable "Criteria for and baseline assessment of environmental and socio-economic impacts of food waste"

⁵¹ For a more detailed methodology for social assessment, please refer to EU FUSIONS deliverable "Criteria for and baseline assessment of environmental and socio-economic impacts of food waste"

Projects and other measures

To what extent has the intervention been cost effective? (Cost/benefit analysis)

Objective	Indicator	Calculation method	Source of data	Frequency
	Total annual direct costs related to: administration, advertising, funding, equipment, material, workshops	Annual sum of all costs related to the implementation of the school programme in relation to the total allocated budget	School district statistics, financial statements	Yearly after approval of the school programme
	Improved motivation of employees as result of implemented action	Qualitative analysis of survey analysis	In-house surveys taken by coordinators	Yearly after approval of the school programme

Table set 12: Criterion - Relevance

<i>Projects and other measures</i>				
To what extent is the intervention still relevant?				
Objective	Indicator	Calculation method	Source of data	Frequency
Identify how the educational programme, paired with the schools' dining services food waste reduction efforts are still providing added value	Relevance of the lesson plans in line with evolving food waste topics	Analysis of assessments made	Qualitative assessment of the quality of lesson plans in relation to needed updates regarding changes in food waste political arena	Yearly after approval of the school programme
	The lasting effects of the initiative (i.e. what level of long-term implementation is observed?)		Questionnaires or progress surveys taken during and after the course of the intervention, campaign organisers	Yearly after approval of the school programme

Projects and other measures

How well do the objectives correspond to the needs within the EU and the national level?

Objective	Indicator	Calculation method	Source of data	Frequency
Identify how local actions within a school district are relevant in the local/regional/ national/EU level	Ratio of number of people in need of food at the local/regional/national/EU level vs the amount of food surplus available after implementation of educational programme and school dining services implemented actions	Total number of people in need of food x amount of daily food intake needed per day per person x number of days = total needed food In comparison to the total amount of available food surplus	School district, local, regional, national and EU statistics	Yearly after approval of the school programme
	Reduction of food waste due to school programme in relation to the national or EU food waste reduction goal ⁵²	Ratio of food waste reduction impact in relation to the 2030 50% Sustainable Development reduction goal/EU Circular Economy Package goal.	Internal monitoring for measure or agreement	Yearly after approval of the school programme

⁵² As of December 2015, the European Commission's new Circular Economy package indicates that the EU-wide food waste target shall be in line with the United Nations General Assembly adopted Sustainable Development Goals for 2030 (target to halve per capita food waste at the retail and consumer levels and reduce food losses along production and supply chains). http://europa.eu/rapid/press-release_MEMO-15-6204_en.htm

5.5 Regulatory instruments

5.5.1 Definition

Regulations and regulatory instruments are governmental or ministerial orders backed by the force of law. Regulatory instruments are sometimes called "command-and-control"; public authorities mandate the performance to be achieved or the technologies to be used. Types of regulatory instruments include standards (including planning instruments), licensing, mandatory management plans and covenants.

Examples of market based instruments that could undergo evaluation are:

- Food waste reduction legislation;
- Food donation legislation;
- Redistribution of food waste;
- Etc.

5.5.2 Case study: French law on retailer food donation

The indicators listed in the following section are tailored to the case study outlined below.

On 11 February 2016, the law on the "fight against food waste" (cf. *LOI n° 2016-138 du 11 février 2016 relative à la lutte contre le gaspillage alimentaire*) was adopted and published in the Official Journal on 12 February 2016.⁵³

This law obliges supermarkets that have a surface area of at least 400m² **to facilitate food waste reduction by establishing contracts with relevant charitable organisations to donate retailer food surplus.**

Establishment of this contractual agreement is mandatory in order to firstly address liability concerns. Via these contracts, a retailer signs over the responsibility for the donated food products to the selected charitable organisation. Furthermore, the quality and usability of the donations is underlined; in practice, products can only be sent to charities before their expiration date.

Qualifying retailers are moreover obliged to manage their unsold food within one or several of the four recovery options outlined within the legislation, depending on food quality. This recovery prioritisation mirrors the EU waste hierarchy, specifically:

- Food waste prevention;
- Use of unsold and viable food (fit for human consumption) via food donation or processing;
- Recovery of unsold and viable food (fit for animal consumption) into feedstock; and
- Recovery into compost for agriculture or for energy recovery, including biogas.

⁵³ Journal Officiel de la France (2015). LOI no 2016-138 du 11 février 2016 relative à la lutte contre le gaspillage alimentaire (1) https://www.legifrance.gouv.fr/jo_pdf.do?id=JORFTEXT000032036289

5.5.2.1 Potential list of indicators in relation with the case study

Table set 13: Criterion - *Effectiveness*

<i>Regulatory instruments</i>				
To what extent have the objectives been achieved? What have been the (quantitative) effects of the intervention?				
Objective	Indicator	Calculation method	Source of data	Frequency
Reduce food waste at the retail level	Food waste reduction (percent)	Variation in the percentage of food waste as a share of total national food production from year t and $t-1$ to year t .	National statistics, process monitoring, EU FUSIONS D1.6 Impact of food waste	Yearly after approval of the plan
Reduce food waste at the retail level	Food waste reduction (quantity)	Difference between the quantity of food waste (metric tonnes) in years t and $t-1$ ⁵⁴	National statistics, process monitoring	Yearly after approval of the plan
Reduce food waste at the retail level	Food waste reduction (monetary)	Difference between the monetary value of wasted food (Euros) in years t and $t-1$	National statistics, process monitoring, EU FUSIONS D1.6 Impact of food waste	Yearly after approval of the plan
Donate retailers food surplus to charities	Quantity of food surplus donated to charities	Sum of food surplus donated quantities	Retail manager/Signed delivery note	Every time a donation takes place

⁵⁴ For more information on how to quantify food waste at the retail level, please refer to EU FUSIONS Food Waste Quantification Manual: Tostivint, C., Stenmarck, Å., Quedstedt, T., et al. (2015), Food Waste Quantification Manual. <http://www.eu-fusions.org/phocadownload/Publications/Food%20waste%20quantification%20manual%20to%20monitor%20food%20waste%20amounts%20and%20progression.pdf>

Regulatory instruments

What factors influenced the achievements observed? To what extent did different factors influence the achievements observed?

Indicator	Calculation method	Source of data	Frequency
The number of retailers actively participating in initiative/event	Number of companies and organisations	National statistics	Yearly
The number of charities collecting and distributing food surplus	Sum of food surplus donated (tonnages).	Retailer and charity/food bank internal data	Throughout the duration of the intervention
The financial cost contributing to the implementation of the legislation: paying staff, logistics etc.	Sum of all costs related to the intervention	Financial statements	At the end of implementation of the legislation
The number of staff involved (retail staff and charity volunteers)	Sum of all involved retailers and volunteers	Charity volunteers, Retail manager	At the beginning and throughout the implementation of the legislation
The number of charities receiving the retailer's food surplus	Interviews retailers and volunteers	Charity volunteers, Retail manager	At the beginning and throughout the implementation of the legislation
The number of food surplus collections	Interviews retailers and volunteers	Charity volunteers, Retail manager	At the beginning and throughout the implementation of the legislation
The number of cars transporting food surplus from the retailers to the charities	Interviews retailers and volunteers	Charity volunteers, Retail manager	At the beginning and throughout the implementation of the legislation
Charities' capacity	Interviews retailers and volunteers	Charity volunteers, Retail manager	At the beginning and throughout the implementation of the legislation

Table set 14: Criterion - *Efficiency*

<i>Regulatory instruments</i>			
<i>To what extent has the intervention been cost effective? (Cost/effectiveness analysis)</i>			
Indicator	Calculation method	Source of data	Frequency
Total direct costs related to implementing the legislation (staff hired, management of food surplus, quantification of food surplus, capacity, transport, food waste disposal, etc.)	Annual sum of all costs related to the implementation of the law in relation to the total allocated/estimated budget per retailer and per charitable organisation	Campaign statements organisers, financial	At the end of the intervention

<i>Regulatory instruments</i>			
<i>To what extent are the costs (qualitative) involved justified, given the changes/effects which have been achieved?</i>			
Indicator	Calculation method	Source of data	Frequency
The total budget and quantity of food surplus saved via food donation	Benchmark of the quantity of food donated before and after actions are set in place	Retail manager	At the end of the implementation of the legislation
The total budget of food surplus management	Ratio between the costs related to donation of food surplus and the costs related to the disposal of food surplus	Retail manager	At the beginning and throughout the implementation of the legislation
Comparison of surveys	In-house surveys taken by coordinators	Before and after implementing the measure /bi-annual	At the end of the implementation of the legislation

Table set 15: Criterion - Relevance

<i>Regulatory instruments</i>			
To what extent is the intervention still relevant?			
Indicator	Calculation method	Source of data	Frequency
Amount of avoidable food waste still occurring in the supply chain	Sum of edible food (tonnes) within supply chain minus food surplus (comprising all steps in the food supply chain)	Internal statistics from all stakeholders involved	Bi-annually
Amount of avoidable food waste which is sent to landfill or incineration	Direct measurement of food surplus which is being disposed at the retail level.	Retail manager	Bi-annually

<i>Regulatory instruments</i>			
To what extent have the objectives proved to be appropriate for the intervention in question?			
Indicator	Calculation method	Source of data	Frequency
Number of conventions signed by retailers with charities	Sum of conventions signed by retailers	Retail managers	Yearly
Number of retailers donating food surplus to charities	Sum of retailers donating food surplus to charities	Retail managers	Yearly
Number of charities collecting food surplus from retailers	Sum of charities collecting food surplus from retailers	Charities	Yearly
Quantities of food surplus donated to people in need	Direct measurement	Charities	Yearly

5.6 Voluntary agreements

5.6.1 Definition

Voluntary Agreements involve a number of organisations within a sector or across multiple sectors who sign up to a commitment to take action against a specific target. As a policy tool, they can be a useful alternative to legislation. Voluntary agreements can also be examples of social innovation.

Examples of voluntary agreements that could undergo evaluation are:

- awareness and information campaign for households and companies' staff members;
- increase in food redistribution activities (from companies to social organisations) as well as establishment of food sharing (between private households);
- optimisation of processes along the food supply chain (ordering system, transport, returned goods, product availability, demand-oriented assortment);
- funding of research activities;
- integration of food prevention projects and activities from all partners within the initiative website and communication;
- opportunity to develop joint communication activities;
- support to school projects (e.g. teaching materials, awards, project ideas);
- etc.

5.6.2 Case study: "Leftover Lunch" & Courtauld Commitment 3

The indicators listed in the following section are tailored to the case studies outlined below.

Leftover Lunch

This voluntary agreement was promoted in 2014 by Sitra - the Finnish Innovation Fund. Jyväskylä city council started the trial to try and prevent overproduced food going to waste. Leftover lunch was implemented for and catered to individuals who would not otherwise eat two warm meals per day, e.g. siblings, parents and grandparents of the pupils, elderly people and unemployed. These people can benefit from these events also by getting useful opportunities to go out and having social contacts.

After school lunch time canteens open the doors for neighbourhood people who can have lunch at a very low price, food is sold at a bargain price of 1.5 €. The price was based on the cost of milk, bread and butter, the traditional side dishes of a Finnish school meal, with the main dish effectively free of charge.

Other municipalities, including Espoo, Oulu and Rovaniemi, are keen to try similar schemes. Today over 20 towns are selling food after lunch. Sitra has also made a guide slide show for school canteens and school managements on how to organise and inform about food left from the lunch.

Courtauld Commitment 3

The Courtauld Commitment 3⁵⁵ was launched early May 2013 and ran until 2015. It aims to build on previous Courtauld Commitments to further reduce the weight and carbon impact of household food waste, grocery product and packaging waste, both in the home and the UK grocery sector. The Courtauld Commitment 3 includes action in the food and drink retail supply chain and the Love Food Hate Waste (LFHW) consumer behaviour change activity.

The impact of the commitments, at the conclusion of Courtauld Commitment 3 is predicted to be a cumulative reduction of:

- 1.1 million tonnes of waste,
- 2.9 million tonnes of CO₂(e) and
- A cost benefit of £1.6 billion to consumers, food and drink sector and local authorities. During the three phases of the Courtauld Commitment, a 20% reduction in household food waste could be achieved.

The agreement is funded by Westminster, Scottish, Welsh and Northern Ireland governments and delivered by WRAP.

⁵⁵ WRAP. Courtauld Commitment 3, 2013. Website available here <http://www.wrap.org.uk/content/what-is-courtauld>

5.6.2.1 Potential list of indicators in relation with the case study

Table set 16: Criterion - *Effectiveness*

Voluntary agreements <i>To what extent have the objectives been achieved? What have been the (quantitative) effects of the intervention?</i>				
Objective	Indicator ⁵⁶	Calculation method	Source of data	Frequency
Identify food waste avoidance within schools participating in the food distribution programme in comparison to the amount of needy individuals benefitting from the programme/food waste avoidance in the home and the retail sector via application of Courtauld Commitment 3	Percent of food waste avoided via food redistribution services/application of Courtauld Commitment 3	Variation in the percentage of food waste as a share of total national food production from year <i>t</i> and <i>t-1</i> to year <i>t</i> in comparison to number of needy people fed	Regional, national statistics, process monitoring, EU FUSIONS D1.6 Impact of food waste, WRAP: Courtauld Commitment 3 statistics	Yearly after implementation of food redistribution programme/ Courtauld Commitment 3
	Quantity of food waste avoided via food redistribution services/application of Courtauld Commitment 3	Difference between the quantity of food waste (metric tonnes) in years <i>t</i> and <i>t-1</i> in comparison to number of needy people fed		
	Monetary savings due to food waste avoided via food redistribution services/application of Courtauld Commitment 3	Difference between the monetary value of wasted food (Euros) in years <i>t</i> and <i>t-1</i> in comparison to number of needy people fed		
	Quantity of CO₂ emission reduction due to food waste avoided via food redistribution services/application of Courtauld Commitment 3	Ratio of the reduction of CO ₂ emissions (metric tonnes) thanks to food redistribution and the total annual cost of the national plan measures in the same year ⁵⁷ in comparison to number of needy people fed		
Identify the reach of targeted stakeholders included within food waste educational	Quantity of needy individuals benefitting from food surplus redistribution	Evolution of total number of children/respective families/teachers/ school	Statistics from school systems/retail sector on number of benefitting individuals	Before implementation of food surplus redistribution programme and yearly following

⁵⁶ Other indicators that are not applicable to this case study, however that could be applied to other policies are: food waste reduction (percent, quantity, monetary) in primary pre-harvest production, primary post-harvest production, wholesale/retail, etc.

⁵⁷ For a more detailed methodology for environmental assessment, please refer to EU FUSIONS deliverable "Criteria for and baseline assessment of environmental and socio-economic impacts of food waste"

Voluntary agreements

To what extent have the objectives been achieved? What have been the (quantitative) effects of the intervention?

Objective	Indicator ⁵⁶	Calculation method	Source of data	Frequency
programme/targeted home & retail sector	programme/application of Courtauld Commitment 3	staff/retail staff involved in educational programme in years n- and n-1 in comparison to number of needy people fed		its implementation
Identify educational efforts made to spread awareness about the benefits of redistributing food surplus/application of Courtauld Commitment 3	Number of internal workshops organised for the community/retail sector	Sum of all workshops related to the food supply chain in relation to a reduction in food waste post-ceding workshop	Statistics from school districts, local authorities for food waste figures, planned workshops, and the EU actions against food waste platform, WRAP: Courtauld Commitment 3 statistics	Periodic, whenever new workshops are launched
Identify the implementation of school food surplus redistribution activities (<i>applicable to Leftover Lunch</i>)	Number of local, regional, national, and EU-wide school food surplus redistribution activities	Sum of actions	EU FUSIONS Deliverable: National Country Report, National ministry of environment page, regional & local statistics,	Yearly after implementation of food redistribution programme

Voluntary agreements

What factors influenced the achievements observed? To what extent did different factors influence the achievements observed?

Objective	Indicator	Calculation method	Source of data	Frequency
Identify the effectiveness in promoting the food surplus initiative/Courtauld Commitment 3	Number of media spreads that advertise food surplus redistribution activities/Courtauld Commitment 3	Sum of all media spreads vs increased support at the local, regional, national level	Regional and national event pages and campaigns, retail sector implementing Courtauld Commitment 3, WRAP: Courtauld Commitment 3 statistics	Yearly after implementation of food redistribution programme/Courtauld Commitment 3
	The scale of (national) coverage of the leftover lunch action/ Courtauld Commitment 3 amongst consumers	Population reach divided by national population in order to obtain the total percentage of population reach on educational programmes/ Courtauld Commitment 3 outreach	National statistics, Census, campaign organisers, retail sector implementing Courtauld Commitment 3, WRAP: Courtauld Commitment 3 statistics	Yearly after implementation of food redistribution programme/Courtauld Commitment 3

Voluntary agreements

What factors influenced the achievements observed? To what extent did different factors influence the achievements observed?

Objective	Indicator	Calculation method	Source of data	Frequency
	The number of food chain actors actively participating in initiative/event	Number of schools and retail organisations involved in order to carry out the initiative	School district, dining services statistics, retail sector implementing Courtauld Commitment 3, WRAP: Courtauld Commitment 3 statistics	Yearly after implementation of food redistribution programme/Courtauld Commitment 3

Voluntary agreements

To what extent did different factors influence the achievements observed?

Objectives	Indicators	Calculation method	Source of data	Frequency
Identify any positive or negative factors in relation to the achievements	Quantity of food surplus not redistributed due to logistical or infrastructural problems (e.g. insufficient storage capacity or refrigeration issues/primary packaging	Sum of food surplus not donated minus the sum of food surplus donated (tonnages)/sum of food surplus not purchased because of insufficient packaging minus the sum of food surplus purchased	School district statistics, retail sector implementing Courtauld Commitment 3, WRAP: Courtauld Commitment 3 statistics	Yearly after implementation of food redistribution programme/Courtauld Commitment 3

Table set 17: Criterion – Efficiency

<i>Voluntary agreements</i>				
To what extent has the intervention been cost effective? (Cost/benefit analysis)				
Objective	Indicator	Calculation method	Source of data	Frequency
Identify if the programme's financial cost is within the parameters of the allocated budget	Expenditure ⁵⁸ /reduction ratio	Ratio of the total annual cost of the redistribution programme and the monetary value of the redistributed food surplus within the same year at the school in question within the school district/ Ratio of the total annual cost of the application of the Courtauld Commitment 3 and the monetary value of the food saved the same year via innovative packaging	School district statistics, National statistics, process monitoring, retail sector implementing Courtauld Commitment 3, WRAP: Courtauld Commitment 3 statistics	Yearly after approval of the school programme/Courtauld Commitment 3
	Labour variation	Ratio of the number of working hours necessary for implementing the redistribution programme/Courtauld Commitment and the number of working hours	School district statistics, National statistics, process monitoring, retail sector implementing Courtauld Commitment 3, WRAP: Courtauld Commitment 3 statistics	Yearly after approval of the school programme/ Courtauld Commitment 3
	Environmental efficiency	Ratio of the reduction of CO ₂ emissions (metric tons) thanks to redistributed food surplus/application of Courtauld Commitment 3 (innovative packaging) and the total annual cost of the programme in the same year ⁵⁹	School district statistics, National statistics, process monitoring, retail sector implementing Courtauld Commitment 3, WRAP: Courtauld Commitment 3 statistics	Yearly after approval of the school programme/ Courtauld Commitment 3
	Social efficiency	Ratio of the total number of kilocalories recovered thanks to reduced food waste and the total	School district statistics, National statistics, process monitoring, retail sector implementing	Yearly after approval of the school programme/ Courtauld Commitment 3

⁵⁸ A significant expenditure may be considered either positive or negative: positive because it could represent a proxy of government's engagement in food waste reduction, negative because it could suggest that additional resources (different from food) are wasted, and food waste reduction is thus becoming a self-fuelling business.

⁵⁹ For a more detailed methodology for environmental assessment, please refer to EU FUSIONS deliverable "Criteria for and baseline assessment of environmental and socio-economic impacts of food waste"

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To what extent has the intervention been cost effective? (Cost/benefit analysis)

Objective	Indicator	Calculation method	Source of data	Frequency
		cost of the school programme/retail sector in the same year ⁶⁰	Courtauld Commitment 3, WRAP: Courtauld Commitment 3 statistics	
	Total annual direct costs related to: administration, advertising, funding, equipment, material, workshops	Annual sum of all costs related to the implementation of the redistribution programme/Courtauld Commitment 3 in relation to the total allocated budget	School district statistics, financial statements, retail sector implementing Courtauld Commitment 3, WRAP: Courtauld Commitment 3 statistics	Yearly after approval of the school programme/Courtauld Commitment 3

⁶⁰ For a more detailed methodology for social assessment, please refer to EU FUSIONS deliverable "Criteria for and baseline assessment of environmental and socio-economic impacts of food waste"

Table set 18: Criterion - Relevance

Voluntary agreements				
To what extent have the objectives proved to be appropriate for the intervention in question?				
Objective	Indicator	Calculation method	Source of data	Frequency
Assessment of different implemented actions or components of the policy to determine the intervention's relevance	Relevance of communication instruments used (outreach per communication instrument)	Total number of contacts per capita: number of hits to the dedicated website (if relevant), number of calls received to the dedicated phone number (if relevant), and number of received emails to the dedicated generic project email (if relevant).	Local and school district data, retail sector implementing Courtauld Commitment 3, WRAP: Courtauld Commitment 3 statistics	Every month after implementation of communication instrument/Courtauld Commitment 3
	Stakeholder involvement	Share of stakeholders involved in the food redistribution/application of Courtauld Commitment out of the total number of stakeholders solicited	Administrative databases, retail sector implementing Courtauld Commitment 3, WRAP: Courtauld Commitment 3 statistics	Yearly after approval of the school programme/Courtauld Commitment 3
	Reduction in national food waste quantities in comparison to the EU target	National food waste reduction in t minus $t-1$ (or other baseline year) in comparison to EU target	Local and school district data, national landfill and incineration statistics	Yearly after approval of the school programme/Courtauld Commitment 3
	Number of school districts that redistributes food surplus compared to those that send food surplus to landfill, incineration, and other outlets/number of retailers that apply Courtauld Commitment 3 (and inherently reduce sending to landfill) compared to those that do not apply it	Sum of school districts that donated vs the sum of companies that send food surplus to landfill and other outlets (tonnages)/ Sum of school districts that apply Courtauld Commitment 3 vs the sum of companies that do not	Local and school district data, national landfill statistics, retail sector implementing Courtauld Commitment 3, WRAP: Courtauld Commitment 3 statistics	Yearly after approval of the school programme/Courtauld Commitment 3
	Amount of food surplus donated (by companies) vs amount of food surplus sent to landfill or	Sum of food surplus (in tonnes) that was donated vs the sum sent to landfill (tonnages)/ Sum	Retailer and charity/food bank internal data, national landfill statistics	Yearly after approval of the school programme/Courtauld Commitment 3

Voluntary agreements

To what extent have the objectives proved to be appropriate for the intervention in question?

Objective	Indicator	Calculation method	Source of data	Frequency
	incineration (by companies)/ Amount of food waste avoidance via application of Courtauld Commitment 3 vs baseline year	of food surplus (in tonnes) sent to landfill in year n minus baseline year		
	Out of the total amount of food surplus, the ratio of surplus food in food industry redistributed for human consumption (<i>applicable to Leftover Lunch</i>)	Amount of surplus food for human consumption divided by the total amount of food surplus.	National statistics	Yearly

Voluntary agreements

How well do the objectives correspond to the needs within the EU and the national level?

Objective	Indicator	Calculation method	Source of data	Frequency
Identify how local actions within a school district/retailer organisation are relevant in the local/regional/national/EU level	Ratio of number of people in need of food at the local/regional/national/EU level vs the amount of food surplus available after implementation of educational programme/school dining services/Courtauld Commitment 3	Total number of people in need of food x amount of daily food intake needed per day per person x number of days = total needed food In comparison to the total amount of available food surplus	School district, local, regional, national and EU statistics, retail sector implementing Courtauld Commitment 3, WRAP: Courtauld Commitment 3 statistics	Yearly after approval of the school programme/Courtauld Commitment 3
	Reduction of food waste due to school programme/Courtauld Commitment in relation to the national or EU food waste reduction goal ⁶¹	Ratio of food waste reduction impact in relation to the 2030 50% Sustainable Development reduction goal/EU Circular Economy Package goal.	Internal monitoring for measure or agreement, retail sector implementing Courtauld Commitment 3, WRAP: Courtauld Commitment 3 statistics	Yearly after approval of the school programme/Courtauld Commitment 3
	Reduction in national CO ₂ emissions in comparison to the EU target	The ratio of CO ₂ emission reduction thanks to food waste reduction (via food redistribution/enhanced packaging) in the reference year compared to former years.	Local and school district data, national landfill statistics, retail sector implementing Courtauld Commitment 3, WRAP: Courtauld Commitment 3 statistics	Yearly after approval of the school programme/Courtauld Commitment 3

⁶¹ As of December 2015, the European Commission's new Circular Economy package indicates that the EU-wide food waste target shall be in line with the United Nations General Assembly adopted Sustainable Development Goals for 2030 (target to halve per capita food waste at the retail and consumer levels and reduce food losses along production and supply chains). http://europa.eu/rapid/press-release_MEMO-15-6204_en.htm

6 Interpreting the results

By the end of this chapter, readers will:

- Critically assess the results of the evaluation without taking into account external factors that may lead to false interpretation of the success or failures of a policy;
- Draw conclusions and recommendations based on the qualitative and quantitative assessment; and
- Identify possible adjustments.

6.1 Consolidating evidence and data

An important task in all evaluations is to bring together the evidence collected from different steps of its methodology. After having gone through all the evaluation questions, the evaluator should gather the data obtained using self-developed indicators and analyse the results in order to establish whether the policy can ultimately be considered as effective, efficient, relevant, coherent and has EU added value.

The following questions could guide the evaluator while conducting the analysis: What are the answers to the original research questions? Do the results support each other, or are there apparent contradictions?

The role of the evaluator is to draw together quantitative and qualitative evaluation evidence in order to assess whether the answers to the different questions are consistent. For example, the following scenarios may occur when interpreting the results:

- An awareness raising campaign managed to involve a great number of actors, received a lot of media attention, etc. but has limited evidence of its impact on food waste reduction. The evaluator should ensure that relevant indicators were used (costs, actors involved, publications, number of participants at public events, etc.), before drawing concrete conclusions about the policy's effectiveness or ineffectiveness.
- A policy maker implemented a certification and labelling scheme, but only one retailer has obtained the label. The policy is considered to be inefficient. With this in mind, the evaluator should look for reasons as to why this happened using other evaluation evidence, for example through surveys, etc.
- A policy is fully implemented, all the processes are seen to have worked as expected, but the impact is not the desired one. For example, retailers signed up to a commitment to take action to reduce food waste against a specific target. The evaluation shows that more and more retailers sign the commitment and that they engage in food waste reduction activities. However, the reduction of food waste is very limited. Again, other steps of the evaluation might suggest explanations for this, for example there might be evidence that although they redistribute their food surplus to charities, their food orders increase.

A mix of scenarios is possible. It is the evaluator's role to find the most appropriate solutions. It is important to mention that these conclusions should not be considered robust findings in their own right, but rather hypotheses which can serve for further testing. Conclusions which are clearly supported by evidence should be set apart from those which need further testing.

6.2 Filling in data gaps

To be noted that if **policy makers do not have data on the quantity of food waste at the national level, EU FUSIONS EU-28 data set is recommended to be used.** Although this data does not cover all topics addressed in Chapter 5, it may serve as relevant support in data collection. The estimates were calculated using a combination of national waste statistics and the findings of selected research studies. This data is available as of April 2016.

It is also recommended to quantify food waste by using the **EU FUSIONS Food Waste Quantification Manual**⁶², in order to guide policy makers with the quantification of food waste at different steps of the supply chain. This Manual can also be used as a reference by researchers who collect data on behalf of national authorities, as well as by national statistical offices. This manual is also available as of April 2016.

⁶² Tostivint, C., Stenmarck, Å., Quested, T., et al. (2015), Food Waste Quantification Manual. <http://www.eu-fusions.org/phocadownload/Publications/Food%20waste%20quantification%20manual%20to%20monitor%20food%20waste%20amounts%20and%20progression.pdf>

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Policy Evaluation Framework

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