



Theory of Change: Acceleration agenda for reducing food waste 2022-2025

Recommendations to the Ministry of Agriculture, Nature and Food Quality (LNV)

Dr H. (Hilke) Bos-Brouwers, Drs T.J. (Thom) Achterbosch, Dr B. (Bob) Castelein,
J.M.I. (Josianne) Cloutier MSc

PUBLIC



WAGENINGEN
UNIVERSITY & RESEARCH

Theory of Change: Acceleration agenda for reducing food waste 2022-2025

Recommendations to the Ministry of Agriculture, Nature and Food Quality (LNV)

Authors: Dr H. (Hilke) Bos-Brouwers, Mr T.J. (Thom) Achterbosch, Dr B. (Bob) Castelein, J.M.I. (Josianne) Cloutier MSc

Institute: WFBR, WEcR

This research was conducted by Wageningen Food & Biobased Research and Wageningen Economic Research, subsidised and funded by and on behalf of the Ministry of Agriculture, Nature and Food Quality.

Wageningen Food & Biobased Research
Wageningen, July 2023

Public

Report 2451

DOI: 10.18174/634947

WFBR Project Number: 6234226300

BAPS number: BO-43-110-018

Version: Final

Reviewer: Mr J.C.M.A. (Joost) Snels

Approved by: Dr H. (Henk) Wensink

Produced by: Wageningen Food & Biobased Research and Wageningen Economic Research

Subsidised, funded by and commissioned by: the Ministry of Agriculture, Nature and Food Quality

This report is: Public

The research described in this report was conducted objectively by researchers who are impartial with respect to the client(s) and sponsor(s). This report can be downloaded free of charge at <https://doi.org/10.18174/634947> or at www.wur.nl/wfbr (under WFBR publications).

© 2023 Wageningen Food & Biobased Research, an institute under the legal entity Stichting Wageningen Research.

PO Box 17, 6700 AA Wageningen, T 0317 48 00 84, E info.wfbr@wur.nl, www.wur.nl/wfbr. Wageningen Food & Biobased Research is part of Wageningen University & Research.

All rights reserved. Nothing in this publication may be copied, stored in an automated data file or made public, in any way or form, be it electronic, mechanical, by means of photocopies, recordings or any other method without prior written permission from the publisher. The publisher accepts no liability for any errors or inaccuracies.

Table of contents

Executive summary	5
Intro	5
Recommendations for a Food Waste Acceleration Agenda 2022-2025	6
1 Introduction	10
1.1 Research approach	12
1.2 Report structure	13
2 Framing of provisional recommendations	14
2.1 The problem in numbers	14
2.2 Current ambitions	16
2.3 Current interventions by Food Waste Free United (STV), Roadmaps and Top 10 rules	17
2.4 Theory of Change - Food waste	19
2.5 General orientation towards waste reduction as part of a transition to a sustainable food system	19
2.6 Building blocks of the ToC for "Acceleration agenda for reducing food waste 2022-25"	20
3 Recommendations for the Acceleration Agenda	23
3.1 Overarching recommendations	23
3.2 Recommended roles for the government	24
3.3 Recommendations by cluster	26
3.3.1 Monitoring objectives	26
3.3.2 Inclusion of the primary production sector	27
3.3.3 Across the supply chain, and system-focused	28
3.3.4 The food environment and consumers	30
3.3.5 Policy coherence	31
4 International examples	33
4.1 National programmes by EU member states	33
4.1.1 Spain	37
4.1.3 Germany	38
4.1.4 France	39
4.1.5 Ireland	41
4.2 EU Platform on Food Loss and Food Waste	43
4.3 EU Citizen panel on food waste	44
4.4. International institutions and organisations	51
4.4.1 EEAC - European Environment and Sustainable Development Advisory Council	51
4.4.2 Champions 12.3	51
4.4.3 WRI	52
4.4.4. STOA - Science and Technology Options Assessment 2013	53
4.4.5 FUSIONS & REFRESH	55
4.4.6 WWF	62
4.5 Ask CHAT-GTP	64
5 Inspiration from parallel transitions	67
5.1 National Circular Economy Programme	67
5.2 Protein transition	68
5.3 Mobility	70
5.4 Climate and energy	71

6	Conclusion	76
	References	77
	Annex - Report on external consultations	78

Executive summary

Intro

With 6 years and 9 months to go, the Netherlands faces the significant challenge of halving food waste by 2030 compared to 2015, and thereby achieving Sustainable Development Goal (SDG) 12.3. At the current rate, food waste will not be halved by 2030 (see Figure 1) but will instead be reduced by 21-46.4%¹.

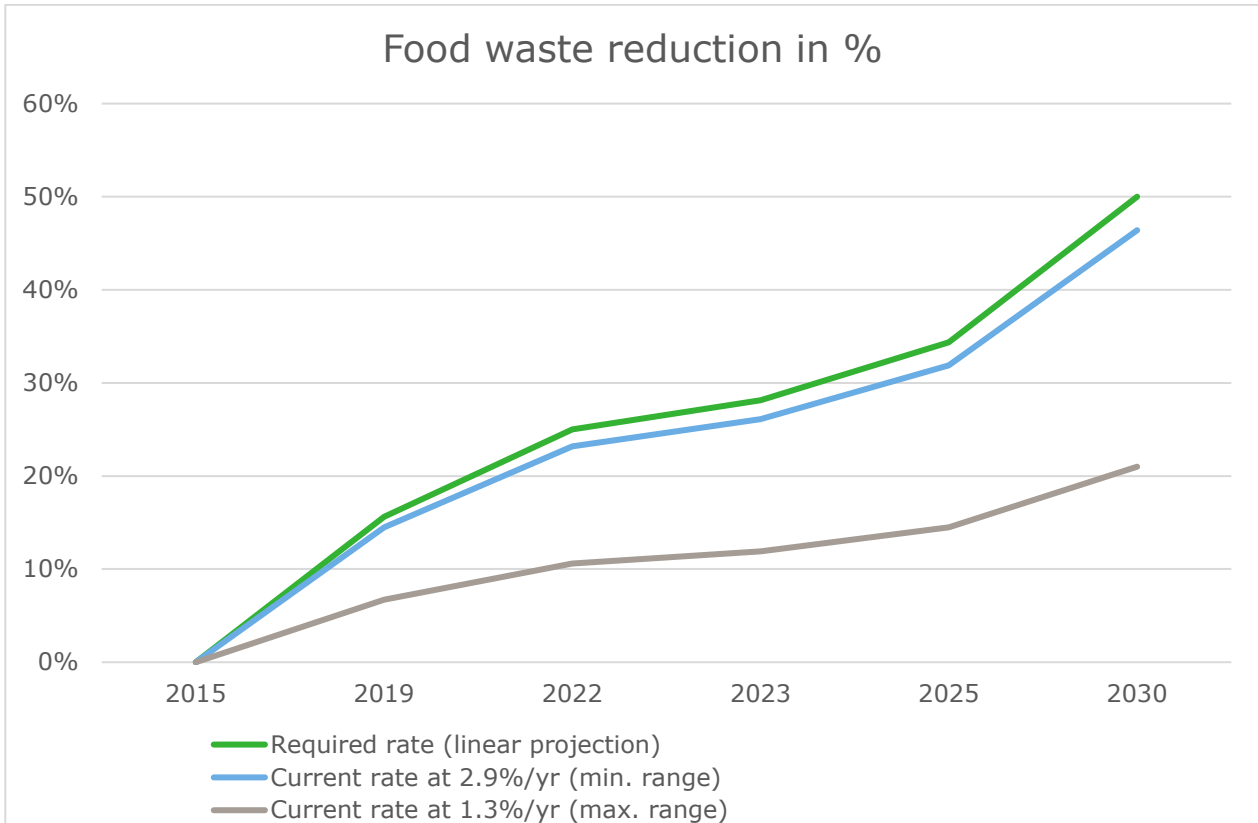


Figure 1: Comparison of required and actual current rates in relation to the halving target (projection to 2030).

In 2023, we should already have achieved at least a 28.1% reduction in food waste in order to be on track. **At the current rate, it seems unlikely we will achieve this target.**

The Ministry of Agriculture, Nature and Food Quality asked Wageningen Research to provide insights that would contribute to a Food Waste Acceleration Agenda 2022-2025, to be drawn up by the Ministry with a perspective towards 2030. The purpose of these recommendations is to provide input into what needs to be done if we are to reduce food waste by half, and what role 'the government' should play in that.

The recommendations in this report draw on a variety of inputs, including a literature review of international examples and parallel transitions, an analysis of the current agenda and interventions, and an external consultation designed to include the experience, input and priorities of relevant stakeholders in the Dutch ecosystem around reducing food waste.

¹ The figures cited represent a range from minimum to maximum amounts of wastage. They are based on the monitoring methodology used in the Food Waste Monitor updates (2009-2019). See Food Waste Monitor update 2009-2019 - WUR | Report | Rijksoverheid.nl

Recommendations for a Food Waste Acceleration Agenda 2022-2025

Overarching recommendations:

1. Focus on an integrated approach to help the Netherlands achieve food management transitions.

- a. Develop a Vision of the Dutch Food System 2030-2050 as a benchmark for choosing short- and medium-term measures.
- b. Make a clear commitment to setting a mandatory target within the European Union and to lobbying positively for this among other member states.
- c. Establish quantitative, interim targets per sector for 2025 in order to enable timely interventions if progress is slow (see table 1).

Table 1: Projection of food waste reduction by 2030.

	Required rate (linear projection)	Current rate at 2.9%/year (min. range)	Current rate at 1.3%/year (max. range)
2015	0%	0%	0%
2019	15.6%	14.5%	6.7%
2022	25.0%	23.2%	10.6%
2023	28.1%	26.1%	11.9%
2025	34.4%	31.9%	14.5%
2030	50%	46.4%	21%

2. Build on the current, successful approach, supplement this with activities that can help accelerate progress, and evaluate the efficacy of measures taken in terms of how they contribute to reaching the target and their potential scalability.

The current interventions and approach being implemented through the multi-actor, multi-level collaborative platform Food Waste Free United (STV) are effective in initiating and driving food waste reduction². This involves:

- Monitoring and reporting food waste: companies are encouraged to monitor their food waste; in addition, the Netherlands Food Waste Monitor is conducted annually and the Household Food Waste Monitor is conducted every three years.
- Food Waste Free United's work in the supply chain: a variety of activities take place to reduce food waste at companies by preventing waste and improving the valorisation of waste streams, e.g. by encouraging innovations.
- Food Waste Free United's work among consumers: efforts are made to motivate consumers to reduce their own waste; these involve the provision of practical tools through, for example, consumer campaigns, interventions and within school programmes.
- Creating an inventory of statutory obstacles: an inventory has been made of laws and regulations that impede companies from reducing food waste.

3. Make it clear that this really is no longer optional.

The current approach focuses on the known underlying causes of waste, including inefficiencies in the supply chain, imbalances of supply and demand, and unsustainable production and consumption patterns. Initiating change requires not just technological innovation but also changes in awareness, behaviour and governance as a way of reducing waste. This goes hand in hand with measuring and reporting progress and impact in accordance with a variety of indicators. An integrated approach would be based on the environmental, economic and social impacts of waste, a good understanding of how the food system is organised, the links with other policy objectives, and how stakeholders interact with each other. There are also limitations to this

² See also: Planted a seed? | Report | Rijksoverheid.nl

approach. It's not a framework specifically intended or suitable for transition thinking or systemic change. While it provides opportunities for backcasting from major future objectives, it has no underlying vision of principles, such as circularity or radical changes to the food system, that recognise the complexity of reducing waste. Indeed, this is not just about achieving lower figures for waste; rather, it's about improving the way we use food and the raw materials used in production and consumption. After all these years, there's still more of a focus on what we don't want, rather than what we do want. A long-term vision of a Dutch food system should articulate how we want to manage food and the rules and standards we want to apply.

There are several ways in which the Dutch government and specifically the Ministry of Agriculture, Nature and Food Quality (LNV) can play a role in accelerating the reduction of food waste. These roles can be broken down into:

1. The Authority
2. The Obstacle Remover
3. The Accelerator
4. The Collaborator

The proposed recommendations call for a combination of these roles.

In addition to this overarching advice, a number of recommendations are set out below to accelerate progress.

I: Monitoring objectives

- **Put more pressure on companies to increase their participation in reporting at the organisational, sectoral and individual supply chain actor level.**
 - **Improve data quality (representativeness, interpretation, expanding the criteria).**
 - **Establish interim milestones for specific supply chain actors and sectors.**
1. Transparent reporting
 2. Elaborating, broadening and supporting monitoring
 - a. Elaborating: environmental impact, economic impact, nutrient losses, land use and soil fertility
 - b. Broadening: to include the primary production sector, countries of origin, public benchmark
 - c. Supporting: interim targets per supply chain actor e and sector, automated recognition/tracking

II: Inclusion of the primary production sector

- **Develop specific interventions targeting agriculture and fishing industry to reduce losses.**
 - **Place actors in the primary production sector on an equal footing vis-à-vis other actors in the system, in order to achieve a better match between supply and demand.**
 - **Expand legal options for using plant and animal waste streams as animal feed.**
3. Making waste an integral and explicit part of agricultural policy
 4. Improving the market position of actors in the primary sector
 - a. Visibility of leading players and their solutions for reducing food waste
 - b. Accessibility of new and alternative markets
 - c. Improving negotiating position
 - i. Market price transparency
 - ii. Flexibility on product specifications and marketing standards
 - iii. Prohibiting cancellation contracts
 - d. Improving statutory protection options to safeguard the position of companies in the primary production sector
 5. Permitting the use of plant and animal waste streams as animal feed
 - a. Modifications to EU legislation
 - b. Room for experimentation and exemptions (possibly temporary)
 6. Addressing losses in international trade/imports

-
- a. Identifying scale of losses in countries of origin
 - b. Identifying scale of losses caused by import requirements / cosmetic rejections by customs
7. Modifications to vaccination and zoonosis policies that help prevent losses in animal production systems.

III: Across the supply chain, and system-focused

- **Establish agreements around preventing and reducing waste across the whole supply chain.**
 - **Address the appropriateness, prioritisation and options for using food waste streams in different ways.**
 - **Increase the sense of urgency and ownership among a wider group of businesses and organisations: there's a positive business case for tackling waste!**
 - **Introduce financial incentives for a waste-free supply chain**
8. Improving supply chain cooperation and logistics
- a. Increasing awareness of the impacts of supply chains
 - b. Promoting research and practical tests on short supply chains
 - c. Developing and supporting the 10x20x30 approach
9. Fair pricing
- a. Cost structure
 - b. Financial incentives
 - c. Impact of price incentives
10. Preventing greenwashing
11. Developing technological or other solutions for complex organic waste streams
12. Modifying food safety standards
- a. MRL values and dilution
 - b. Review of limits and standards
13. Encouraging the engagement of civil society in the Netherlands
- a. Relevance and urgency of the topic
 - b. Funding opportunities
 - c. Social norm = zero waste

IV: The food environment and consumers

- **Continue and where possible intensify information and education campaigns targeting consumers, especially those groups that (so far) are unaware of the issue or don't participate in sustainability endeavours.**
 - **Expand the role of the private sector in empowering consumers to avoid waste by offering 'zero waste' products and information on how to avoid waste.**
14. Continuing consumer campaigns
- a. Educational programmes
 - b. Targeting specific groups
15. Improving the food environment for consumers by engaging the private sector
- a. Simplifying product range and choices
 - b. Action packs for the hospitality industry
 - c. Making links to sustainable/local objectives
 - d. Expanding the provision of consumer information
 - e. Improving the separation of fruit, vegetable and other food waste
16. Discussing the role of food and feed safety within the food system

V: Policy coherence

- **Take a proactive and impact-oriented stance, facilitated by nimble policymaking.**
- **Improve interdepartmental cooperation by linking food waste to the objectives and approaches of other departments (climate, health, bio-economy, energy).**
- **Focus less on voluntary action and more on penalties and pressure backed by legislation.**
- **Share with and learn from other countries: what works, what doesn't, and why? This can deliver greater insight into impactful measures that work within national contexts and will support positive EU lobbying.**

17. Encouraging action

- a. Showcasing demonstration projects
- b. Experimenting with solutions outside of existing frameworks
- c. Raising awareness through European and international platforms
- d. A proactive attitude and short lead times when offering experimentation spaces

18. Embedding waste policy in other, related policies as well as in specific food policies

- a. Interdepartmental cooperation
- b. Creating links to related transitions
- c. Integration into the Dutch national government's circular economy initiative

19. More government pressure

- a. More stick, less carrot
 - i. Monitoring
 - ii. Mandatory targets
 - iii. Statutory framework for sustainable food systems
 - iv. EU taxonomy for investments
 - v. Common Agricultural Policy
 - vi. Revision of EU marketing standards
- b. Inspiring examples and positive lobbying

Food waste is a complex issue and it overlaps in many ways with other issues such as climate change, water use, land use, biodiversity, etc. Reducing waste therefore directly affects the objectives contained within those related issues. Waste can be translated into energy use, raw material use, emissions, water use and other KPIs. Reducing waste by a third would facilitate better use of global agricultural land, and could even reduce it: if you're not producing food destined to be wasted, you can make more efficient use of land and raw materials. There's a clear relationship, but the underlying quantifications and calculations aren't available yet. This is not so much because we lack conversion factors or calculation methods, but because the quality of data around food waste is still too weak to enable calculations at the sectoral or product level. Greater efforts will be needed around this in the near future. The recommendations provided above offer a broad array of opportunities for getting (many) more organisations and companies engaged with the issue and to scale up their efforts, with a specific role for the government to play too.

1 Introduction

With 6 years and 9 months to go, the Netherlands faces the significant challenge of halving food waste by 2030 compared to 2015, and thereby achieving Sustainable Development Goal (SDG) 12.3. Food waste has been high on the political and social agenda since 2009. A first phase (2010-2013) focused mainly on building an understanding of the causes and urgency of the problem, through dialogues between researchers, the government and industry. Between 2013-2015, the first real steps were taken to establish a clear picture of how food waste was happening and to come up with a corresponding monitoring methodology. From 2015-2018, driven in part by European research programmes such as FUSIONS and REFRESH, there was a strong focus on building and expanding partnerships along the supply chain and establishing a national agenda and programme on food waste, culminating in the establishment of the Food Waste Free United (Samen tegen Voedselverspilling, or STV) foundation in December 2018. Its first 4-year programme created roadmaps and targeted interventions – some within supply chains and others aimed at consumers – and started to get industry players to establish their own monitoring systems at both the individual business level and at a sectoral level.

Viewed against what’s been achieved at a national level to reduce food waste, it’s clear that food waste has recently been moving in a downward trend. Based on the annual updates of the Netherlands Food Waste Monitor³ since 2009, it’s evident that in 2019, compared to the baseline year of 2015, food waste was down by 6.7-16.2% (from 1,771 - 2,552 kt to 1,514 - 2,380 kt). At the current rate, the aspiration of halving food waste by 2030 is unlikely to be achieved. If we project current rates to 2030, food waste reduction appears to range between 21% and 46.6% (see Figure 2 and Table 2 for more detailed information).

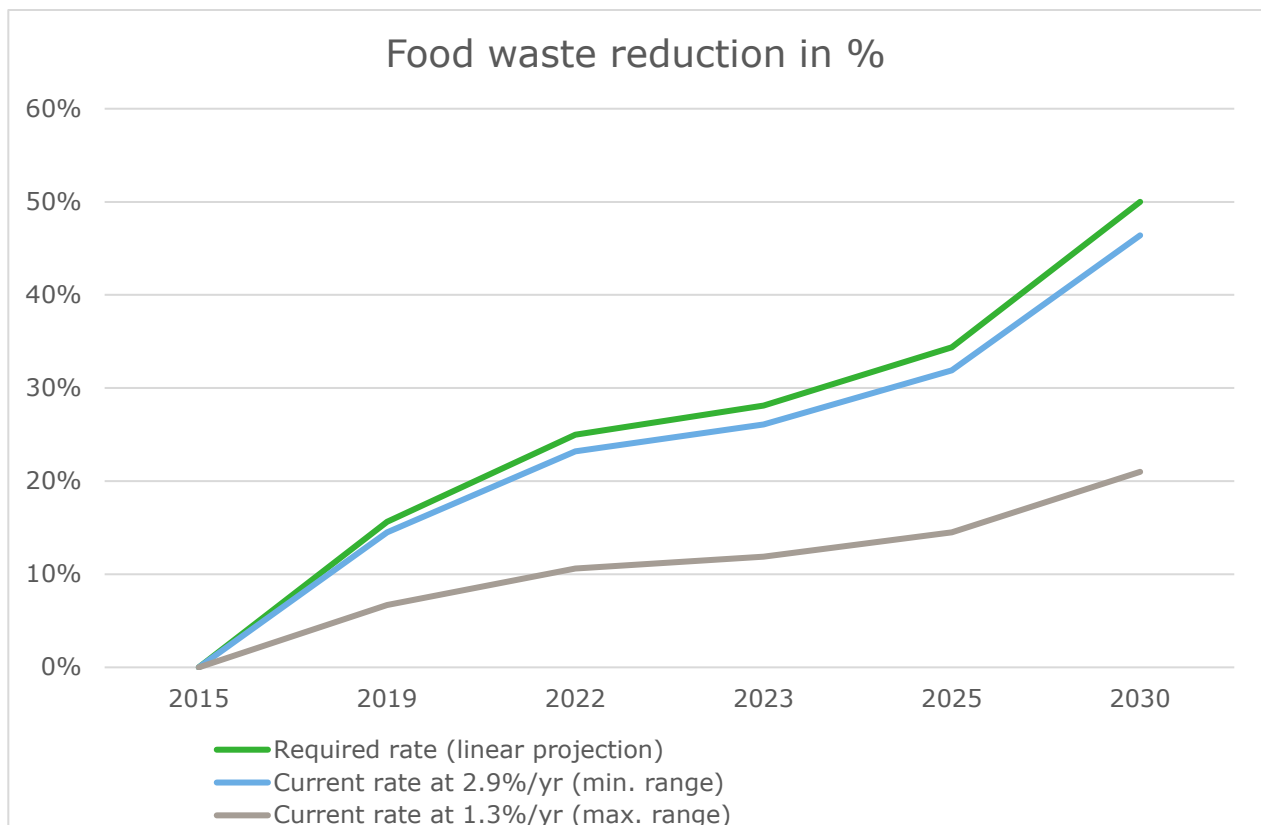


Figure 2: Comparison of required and actual current rates in relation to the halving target (2023 projection).

³ Source: Food Waste Monitor - WUR

Table 2: Projection of food waste reduction by 2030 (% reduction: 2015 as baseline reference year).

	Required rate (linear projection)	Current rate at 2.9%/year (min. range)	Current rate at 1.3%/year (max. range)
2015	0%	0%	0%
2019	15.6%	14.5%	6.7%
2022	25.0%	23.2%	10.6%
2023	28.1%	26.1%	11.9%
2025	34.4%	31.9%	14.5%
2030	50%	46.4%	21%

By 2023, we should have reduced food waste by at least 28.1% in order to stay on track, but at the current rate we are projected to have achieved 11.9-26.1%. To achieve our aspiration of halving food waste, by 2025 we need to have accelerated progress so that food waste is 34.4% less than it was in 2015. This represents an acceleration of 8.3-22.5% over the next two years.

The calculations used for these figures assume that production, consumption and the population remain constant. This does not entirely reflect the complex reality. There's still a lack of good quality data at the sectoral and product level, even though measurements have been taken for more than a decade. The figures above should therefore be interpreted as a simplified representation of a trend, and not as exact science. We have also assumed a linear rate of reduction across the 16 years from 2015 to 2030. It's fair to say that progress in the first few years has been slower because of the experimental and small-scale nature of the changes needed within the food system. Change takes time. However, over the past eight years we haven't yet seen a major trend reversal, although there's been a decline in waste among consumers and in supermarkets since 2018.

When we consider other challenging transitions (climate, energy), it's evident that scaling up to larger volumes, bringing in more stakeholders and creating systemic transitions is not something that just happens automatically.

It's increasingly clear that if we are to achieve a halving of food waste compared to the 2015 baseline year, we need to take bigger and faster steps. There are already many good examples or potential techniques available, both at home and abroad, but across business and government as a whole there still isn't enough of a focus on urgency, acceleration and scaling up.

We need to reassess, fine-tune and follow up on the ambitions and interventions set out in the first food waste agenda (2018-2021) so that we can clearly articulate what we need to do to realise our objectives in the Netherlands, and which interim results we would need to achieve (see Figure 3 for an illustration). The Ministry of Agriculture, Nature and Food Quality (LNV) asked Wageningen Research to provide insights that would contribute to a Food Waste Acceleration Agenda 2022-2025, to be drawn up by the Ministry, with a perspective towards 2030. The purpose of these recommendations is to provide input into what needs to be done if we are to reduce food waste by half, and what role 'the government' should play in that.

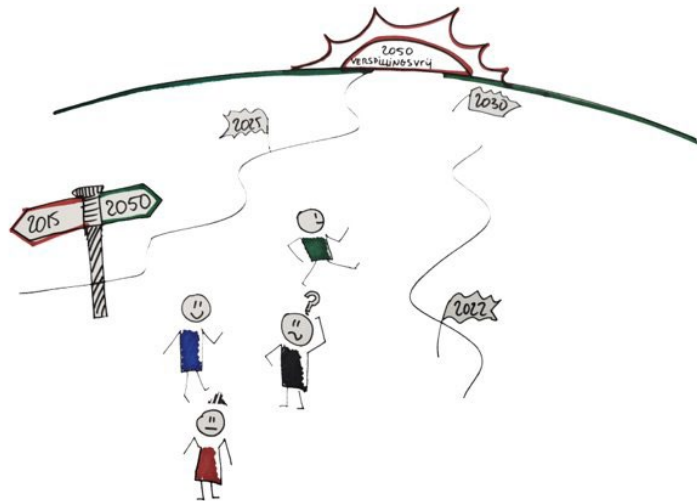


Figure 3: Towards 2050 with zero food waste.

The research questions set by the Ministry are as follows:

1. What should the interim results be, and how can we monitor our progress along the way (quantitative and qualitative key indicators [KPIs])?
2. How does this process fit into other, related transitions and impacts (such as climate change, water, land use, biodiversity, etc.)? From kilo to impact, how does waste make a difference?
3. What is the assumed role in this of relevant actors in the Dutch food system? What will it take to engage (many) more organisations and companies and to scale up their involvement? What should the government be doing as part of this?

1.1 Research approach

The recommendations in this report are based on a variety of inputs (see Figure 4).

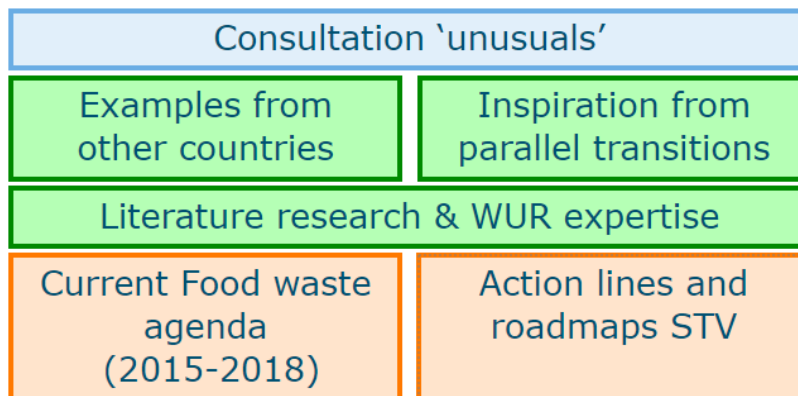


Figure 4: Gathering of inputs for provisional recommendations.

The project took a phased approach, looking back over recent years and ahead towards 2025 - 2030 - 2050. It explicitly included the experience, input and priorities of relevant stakeholders from the Dutch ecosystem around food waste. **Interviews** were used as a way of discussing the current agenda and interventions with representatives of Food Waste Free United (STV) and the Ministry of Agriculture, Nature and Food Quality (LNV). In addition, the project team carried out **literature review**, particularly on **examples from other countries** (including qualitative analysis of national food waste programmes in European member states,

Australia, the UK and the US), and looked for **inspiration from parallel transitions** in areas such as energy, mobility, the built environment, and climate, where also firm ambitions for 2030 and 2050 have been articulated in government policy. Drawing on expertise within the team, the current agenda/interventions were translated into the **Theory of Change approach**, in order to develop a framework to identify interventions for 2022-2025, including a perspective towards 2030.

The purpose of the **consultation with 'unusuals'** (organisations not yet actively engaged with the issue of food waste) was to seek inputs from a variety of representatives of networks and companies in and around the food system with regard to new or (more) extensive measures to accelerate the reduction of waste and to reflect on the role of the Ministry of Agriculture, Nature and Food Quality (LNV) in this.

This external consultation was supported by an **independent facilitator**, Mariken Gaanderse (Fonkeling).

As part of the consultation, an online kick-off event was organised on 18 October 2022 to explain the background and approach. This meeting was recorded and shared with a list of more than 110 'unusuals'. Almost 30 of them participated in one of the three in-depth online consultation sessions on 2, 4 and 8 November 2022 (see Figure 5), and the concluding session held on 15 December 2022 at the WTC, The Hague. Reflecting on the participation in the consultation, we feel that we were largely successful in reaching the target group. Even so, there are huge gains to be made by engaging with stakeholders who do not feel that the topic of 'waste' is immediately relevant to them. We were able to build links between several stakeholders, including some from the financial sector, NGOs and other policy departments, from the perspective of short supply chains and with a focus on multi-actor engagement). The report by Ms Gaanderse is included as an annex to this report for the sake of thoroughness and transparency.

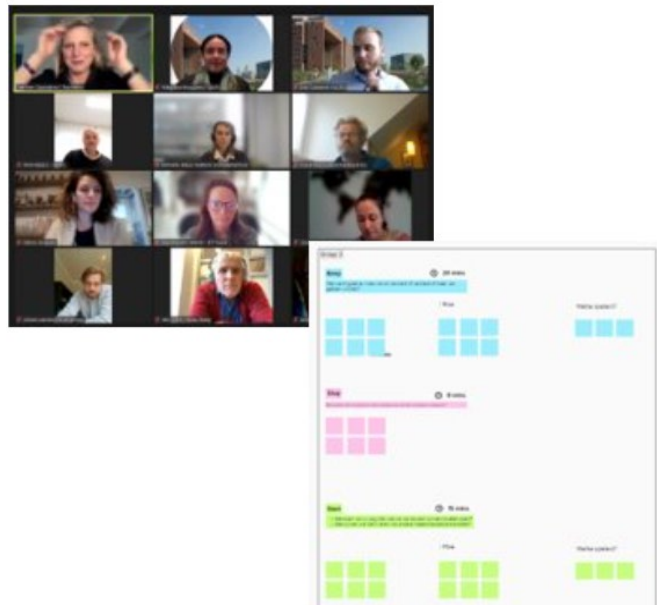


Figure 5: Screenshots of the in-depth online session and the MIRO board used for capturing inputs by stakeholders.
Source: authors

1.2 Report structure

This report is based on the various inputs used to compile our recommendations. These fall into three parts. Part 1 (chapter 2) explains the framing of the recommendations based on an explanation of current issues, ambitions and interventions. It also explains the Theory of Change approach and introduces the building blocks of the recommendations for the Food Waste Acceleration Agenda. Part 2 (chapter 3) provides an overview of the recommendations, broken down into overarching recommendations, the roles that the government can play, and recommendations for each cluster. Part 3 (chapters 4 and 5) looks in more depth at inspiring examples from other countries and parallel transitions, to provide some background for the proposed recommendations. Finally, Chapter 6 provides a conclusion and suggestions for follow-up research.

2 Framing of provisional recommendations

This chapter describes the various backgrounds and frameworks that have been used to formulate the provisional recommendations. It includes explanations of the 'food waste in figures' problem (2.1), the current ambitions of the Dutch government (2.2), and the interventions, roadmaps and top 10 ground rules used by Food Waste Free United (STV) as a starting point for framing the provisional recommendations (2.3). We then describe the Theory of Change (ToC) approach (2.4) that we have used to structure inputs into a set of actionable clusters in line with the purpose of the underlying research. To do this, we started by converting the current 2018-2021 agenda and STV's roadmaps and interventions into the ToC 'format'. Then, based on a literature review and initial insights from the interviews and consultation, we compiled the new outcome and activity clusters.

2.1 The problem in numbers

The most recent figures on food waste use 2020 as a baseline year. The new, mandatory national monitoring requested by the EU⁴ reveals that as a whole, the member states generate around 57 Mt of food waste per year. Figure 6 below shows how this is broken down into economic sectors (in kg per person per year).

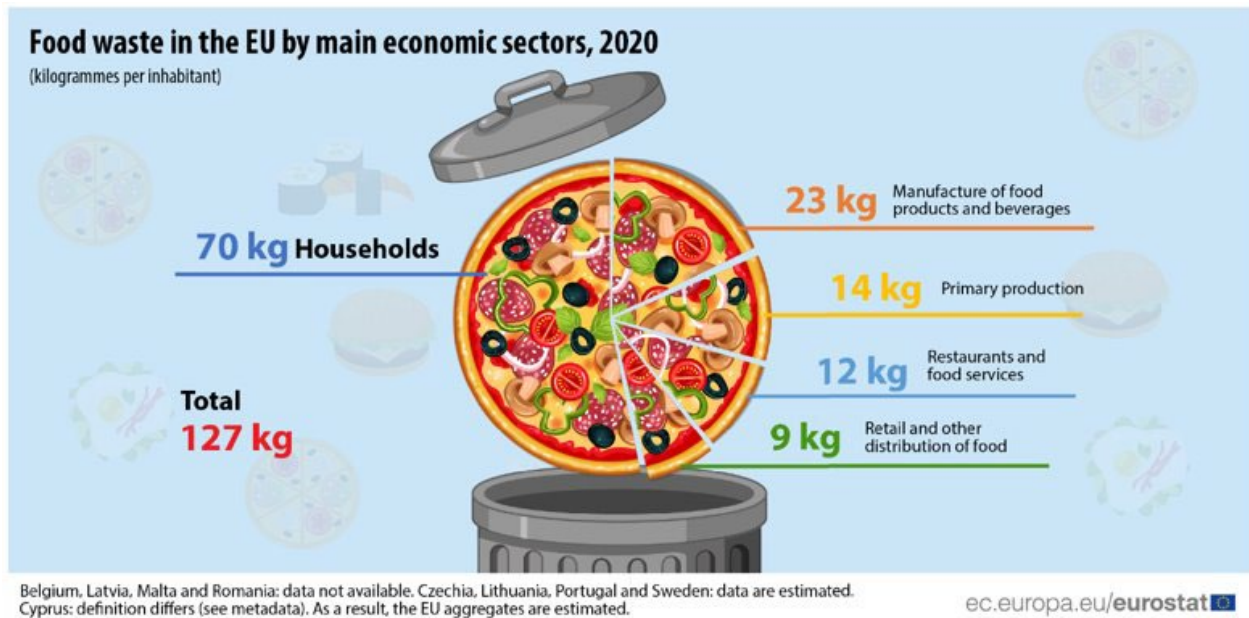


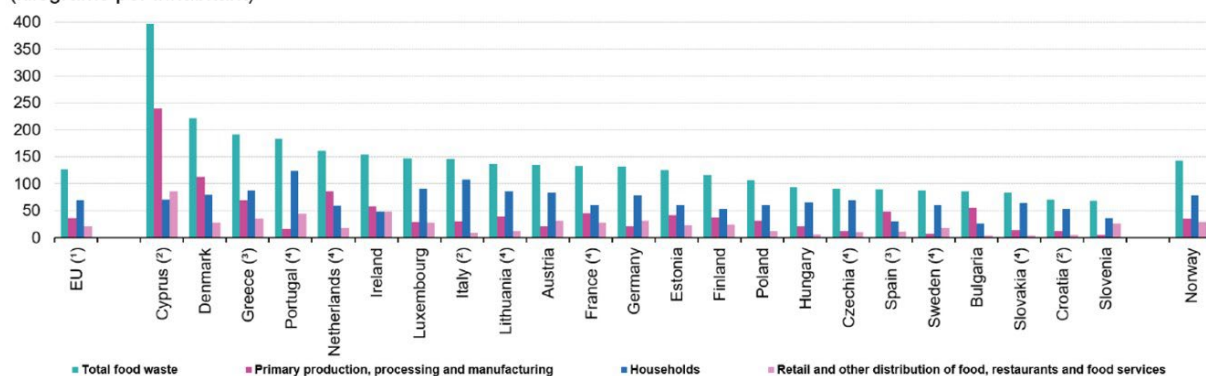
Figure 6: Distribution of food waste in EU by main economic sectors.
Source: Eurostat 2022.

Broken down across the different member states, we can see that the Netherlands 'scores' relatively highly, as the fifth most wasteful country (see Figure 7).

⁴ This monitoring requirement is included in the Revised Waste Framework Directive (EC/2018/851); see full text here: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32018L0851>

Food waste by sector of activities by Member State, 2020

(kilograms per inhabitant)



(*) Estimated data

(*) Definition differs in some figures.

(*) Definition differs or estimates in some figures

(*) Estimates in some figures.

Source: Eurostat (online data code: env_wasfw)

eurostat

Figure 7: Food waste (total/per sector) by member state in kilograms per person per year. Source: EUROSTAT, 2022.

In the Netherlands, the annual Food Waste Monitor⁵ has been tracking food waste since 2009, as shown in this trend graphic (see Figure 8).

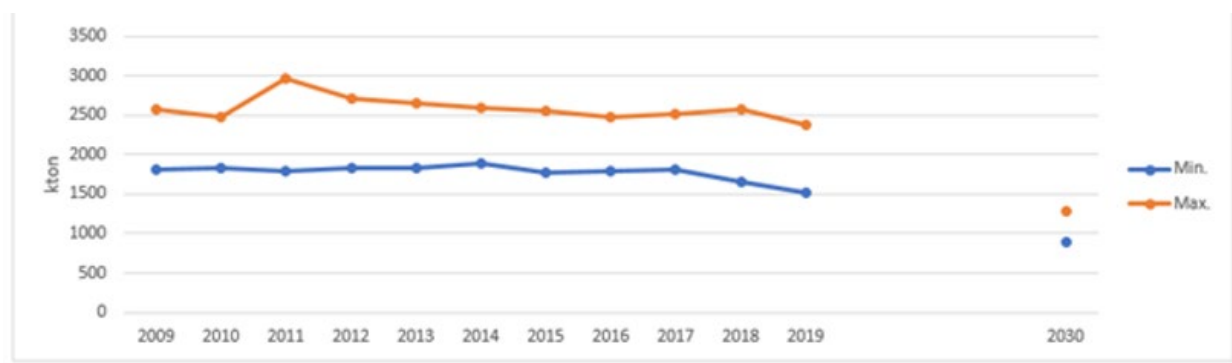


Figure 8: Amount of food waste in the Netherlands 2009-2019 (in kt/year). Source: Based on Vollebregt & Soethoudt, 2021)

These figures have a minimum and maximum value derived from the methodology used. The actual figure moves up and down within this range. Based on these figures, the aspiration to halve food waste can be expressed in figures as follows:

➔ 2015: Baseline year for SDG targets

Total amount of waste: between 1,771 – 2,552 kt

Per person: 105 – 152 kg/per person per year

➔ 2019: Interim result

Total amount of waste: between 1,514 – 2,380 kt

Per person: 88 – 138 kg/per person per year

Reduction achieved: between 6.7-14.5% less waste

➔ 2030: Halving food waste means achieving the following, maximum quantities:

Total amount of waste: between 886 – 1,276 kt

Per person: 57.5 – 76 kg/per person per year

⁵ See the full Food Waste Monitor - Update 2009-2019 here:

<https://www.rijksoverheid.nl/documenten/rapporten/2022/03/08/monitor-voedselverspilling-update-2009-2019-wur>

Based on this data, it's apparent that compared to the baseline year of 2015, waste decreased by 6.7-16.2% in 2019, from 1,771 – 2,552 kt to 1,514 – 2,380 kt. At the current rate, we do not appear to be on track to halve food waste by 2030. A reduction of around 1.3-2.9% per year would get us to 949.3-2,016 kt compared to the 886-1,276 kt aimed for. Compared to the linear rate of progress, which would result in a halving of waste by 2030, food waste should be down by 25% in 2022. However, the actual figure is expected to be between 10.6-23.2%. By 2023, we should have already reduced food waste by at least 28.1% in order to stay on track, but at the current rate that figure is projected to be between 11.9-26.1%. To achieve our aspiration of halving food waste, by 2025 we need to have accelerated progress so that food waste is at least 34.4% less than it was in 2015 (1,162 – 1,674 kt). A new time frame for a possible Food Waste Acceleration Agenda could use the projection below (see Table 3).

Table 3: Projection of food waste reduction by 2030.

	Required rate (linear projection)	Current rate at 2.9%/year (min. range)	Current rate at 1.3%/year (max. range)
2015	0%	0%	0%
2019	15.6%	14.5%	6.7%
2022	25.0%	23.2%	10.6%
2023	28.1%	26.1%	11.9%
2025	34.4%	31.9%	14.5%
2030	50%	46.4%	21%

This projection could also be based on the recently mandated European monitoring carried out by EUROSTAT. The first results of this monitoring were published in 2022, using 2020 as a baseline year. However, because no data on the SDG baseline year of 2015 using the European monitoring methodology has been published, we have opted to base the numerical projection above on the Netherlands Food Waste Monitor. That's because this monitor has tracked annual food waste going back to 2009.

2.2 Current ambitions

Our efforts to identify building blocks have taken into account the ambitions already put in place by the Dutch government and the Ministry of Agriculture, Nature and Food Quality (LNV). These relate in particular to the global and European **target of SDG 12.3**, which is for waste to be halved by 2030⁶. The Dutch government recently articulated a renewed commitment to this at COP 27 in Sharm El-Sheik (November 2022), linking climate targets to the reduction of waste (also referred to as Nationally Determined Contributions). This '**123 Pledge**', which was also declared by 35 other countries, was coordinated by UNEP and FAO⁷. The Netherlands explicitly expressed its intention to actively try and design an ambitious European **Farm-to-Fork Strategy**⁸ by focusing on reducing food waste throughout the supply chain and not just at the retail and consumption level. However, it should also be noted that progress on the SDG 12.3 target is not explicitly included in the SDG 2022 report for the Netherlands compiled by Statistics Netherlands⁹.

The review of the Food Agenda 2016-2020 (March 2022, Ministry of Agriculture, Nature and Food Quality¹⁰) also articulates a number of ambitions by the then Minister Staghouwer, including "[...] efforts to continue pursuing the approach developed for this purpose and to achieve a clearly discernible further reduction of food waste both among consumers and further up the supply chain." Interventions made to this end have included agreeing milestones with relevant stakeholders, and working with relevant research institutions to identify the steps needed to accelerate progress towards achieving the food waste targets (and the shift in

⁶ Source: <https://sdgs.un.org/goals/goal12>

⁷ Source: <https://www.unep.org/technical-highlight/new-123-pledge-set-mobilize-global-action-food-loss-and-waste-key-climate>

⁸ See: https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en

⁹ Source: <https://longreads.cbs.nl/monitor-of-well-being-and-sdgs-2022/sustainable-development-goals-sdgs-in-the-dutch-context/>

¹⁰ Source: <https://www.rijksoverheid.nl/documenten/kamerstukken/2022/03/29/evaluatie-voedselagenda-2016-2020-en-het-voedselbeleid>

protein consumption). The following interventions, drawn from the overall food policy, are also relevant to the reduction of food waste:

- Actively engage in knowledge sharing and networking;
- Further develop standardisation and pricing tools;
- Manage food environments as a way of influencing consumer choices;
- Improve skills and awareness (among other things based on the social norm);
- Convenience and price (including levies/tax increases to influence prices) (in relation to the affordability of sustainable and healthy foods);
- Develop and manage an implementation strategy for an integrated food policy.

The objectives and interventions outlined above are an important step in shaping food policy. "For the term of the current cabinet, I have made a total of €12 million in additional funding available from the Ministry of Agriculture, Nature and Food Quality (LNV) to deliver this. Naturally, we expect the various supply chain partners to make a significant contribution too. I will be discussing with them their efforts in areas such as reducing food waste, creating a more sustainable food supply, procuring more sustainable food, marketing, and the way we design our food environments. The objective is to come to agreements that reflect what is articulated in our Coalition Agreement, with supermarkets being expected to take steps to demonstrably make their product ranges more sustainable and animal-friendly."

2.3 Current interventions by Food Waste Free United (STV), Roadmaps and Top 10 rules

Food Waste Free United (STV¹¹) is an independent foundation founded in 2018, having emerged from pilot projects that were carried out as part of the European Horizon 2020 REFRESH project¹². STV bases its work on the 'Target-Measure-Act'¹³ approach. The organisation establishes voluntary agreements with relevant civil society organisations and private sector players to encourage them to become trailblazers in reducing food waste. It currently works with more than 110 organisations. STV's interventions are structured as follows (see Figure 9):



Figure 9: STV interventions.

Source: STV Infographic – www.samentegenvoedselverspilling.nl.

¹¹ See: <https://www.samentegenvoedselverspilling.nl>

¹² See: <https://www.eu-refresh.org>

¹³ For more details of this approach, see for example: <https://wrap.org.uk/taking-action/food-drink/initiatives/food-waste-reduction-roadmap>

Roadmaps have been formulated for all sectors, with innovation challenges within the Food Waste Reduction Transition Pathway amounting to 1 million tons (see Figure 10).

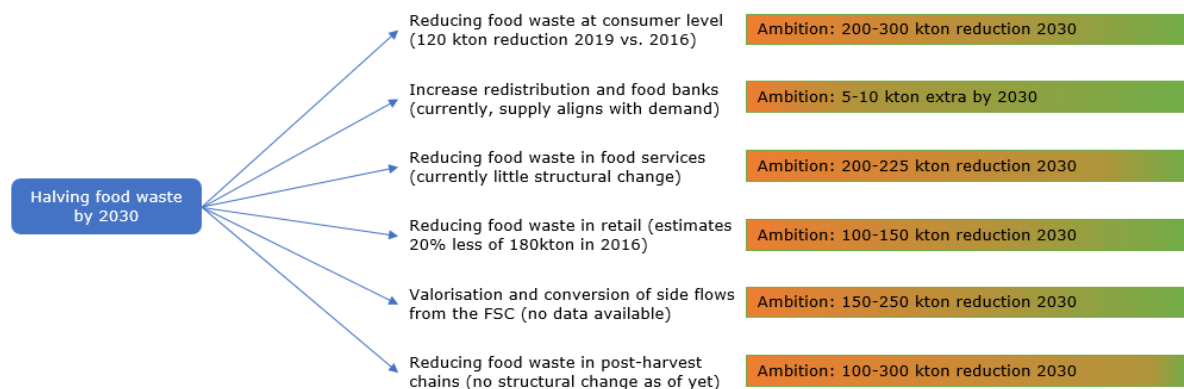


Figure 10: STV Roadmaps.
Source: STV 2022 annual plan.

These roadmaps serve as pathways for impact. Every year, the roadmaps establish priorities based on the following principles:

- Maximum impact (50% reduction, SDG12.3) and Responsible Circular Food System as a long-term ambition;
- Improving and maintaining unity (based on the key stakeholders and the ecosystem);
- The intention that all available public and private resources be organised in an integrated and structured way by a mission-driven, independent non-profit organisation;
- A single portal in the Netherlands to handle any questions related to food loss and waste;
- All actors in the food chain recognise their place in the agenda;
- Attractive nucleus for additional funding and multiplier (public and private) with 'value for money';
- Accessing new sources of funding where possible.

Between 2019 and 2020, STV's Intervention 4 worked on drawing up a strategic Top 10 to change the 'rules of the game', which included scrapping legislative roadblocks so that organisations become incentivised or even required to minimise waste and optimise their use of waste streams. The top 10 Rule Changes¹⁴ are as follows:

1. Harmonising the Dutch definition of food waste with that of the EU, so that food destined as 'fodder' is not considered food waste.
2. Focusing the Common Agricultural Policy (CAP) on production that closely matches demand, removing all incentives for overproduction and harmonising legislation between EU member states.
3. Removal of financial incentives for 'rolling over' unsold products.
4. Decoupling pet food standards from food and livestock feed standards, so that food waste can be used in animal feed (without compromising animal health).
5. Deploying targeted tracking & tracing technologies and adapting regulations to enable rejection at product or batch level to avoid entire consignments being rejected when there's an anomaly.
6. Making efforts to amend European legislation on animal feed (such as the Feed Ban) so that waste streams containing possible (traces) of animal-origin or by-products from the supply chain can be used in animal feed.
7. Developing an overarching vision and the harmonisation of integrated policies (in the Netherlands and EU) for the relationship between packaging, packaging waste and food waste so that packaging optimises product preservation while also helping to optimise its potential to be recycled.

¹⁴ See: Bos-Brouwers et al., 2020. Changing the rules of the game – impact and viability of measures based on policy, laws and regulations related to the causes and prevention of food waste. 529887 (wur.nl)

-
8. Using financial incentives to encourage the valorisation of organic waste streams (reducing waste and avoiding low-grade use of organic waste in industry, for example through the pricing of raw materials and through emission allowances).
 9. Clarifying expiry dates (Best Before / Use By) for consumers and businesses.
 10. Legislating the use of smart sensor technology for flexible shelf-life labelling.

In addition to the priorities described here, STV has indicated that it will continue to focus on a number of other activities which complement the current agenda and interventions.

These include:

1. Harmonising the interpretation, clarity and enforcement of standard-setting laws and regulations, especially those focused on food safety and marketing standards. The aim is not to change or remove the relevant legislation, but to ensure that ministries, authorised government agencies and supply chain actors agree on how to interpret and apply it in a consistent way.
2. Building further on efforts to encourage the private sector to self-report on food waste, but without resorting to statutory obligations (in accordance with Intervention 1).
3. Developing and publishing a food waste benchmark based on data aggregated at the sectoral level (in accordance with Intervention 1).
4. Supply chain relationships: Establishing shared responsibility among all actors in the supply chain in terms of accounting for losses of raw materials and coming up with solutions. This would include new private agreements and modifications to supplier contracts. It would also include interventions related to procurement and sustainable purchasing criteria in the catering sector (in line with the 2018-2019 hotspot of "Cosmetic aspects of trading standards").

2.4 Theory of Change - Food waste

The Ministry of Agriculture, Nature and Food Quality has often used the Theory of Change methodology to come up with multi-year policy and innovation agendas for a variety of social issues related to agriculture, water and food. A theory of change for an intervention describes the set of activities that make up the intervention and how they are seen to fit together as a way of achieving certain desired outcomes and delivering certain effects in relation to social issues. Part of the brief for this study was to come up with an acceleration agenda that aligns with the ToC approach used in the multi-year social innovation agenda (MMIP) for Agriculture, Water and Food.¹⁵ The MMIP D2 ToC specifically articulates one desired outcome as 'achieving 50% less food waste, as part of healthy and sustainable behavioural change among consumers'.

2.5 General orientation towards waste reduction as part of a transition to a sustainable food system

Food waste is an outcome of the way in which we organise food production, processing, distribution, consumption and waste disposal. We can reduce waste by changing our behaviour. Drastically reducing food waste will require a fundamental change to the food system. Given the immense scale of the challenge to cut food waste by half within a decade, we can think of this as a socio-environmental transition requiring the participation of all actors in the food system, but one which is also difficult to enforce. The biggest lever of change in this transition process is the shift in the social acceptability of food waste. The drivers of this transition are consumer and industry awareness, financial and economic incentives, regulation, and innovation. In recent years, the movement towards reducing food waste has been characterised by various measures and activities mainly targeting households, the food industry and the retail sector. The quantitative effects of those interventions have fallen short of expectations. Even so, significant progress has been made in addressing this social issue (see Figure 11).

¹⁵ See: <https://kia-landbouwwatervoedsel.nl/wp-content/uploads/Schemas-Theory-of-Change.pdf>

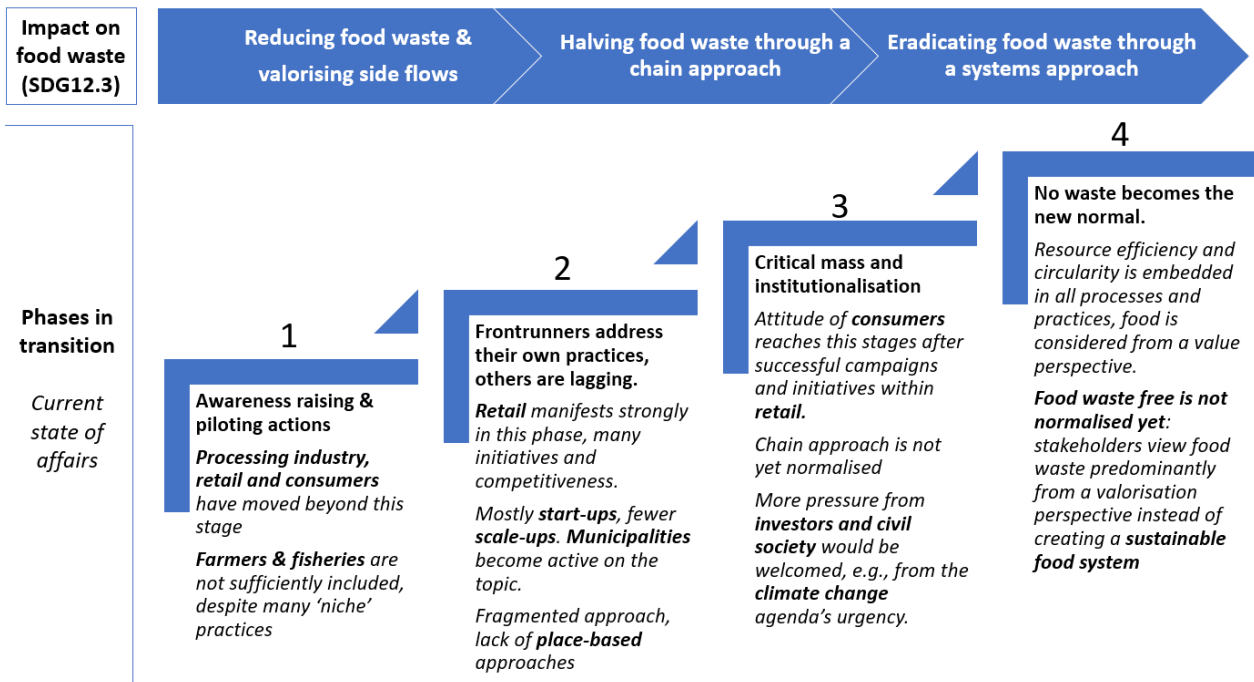


Figure 11: An outline of the current state of affairs in the transition towards reducing food waste.

It's also important that we don't perceive the reduction of food waste as being separate from other social challenges related to the food system. Food systems also have a part to play in solutions to address issues such as climate change, biodiversity decline, environmental pressures, raw material scarcity, public health and social cohesion. A broad perspective of 'sustainable food systems' includes all of those objectives.

2.6 Building blocks of the ToC for "Acceleration agenda for reducing food waste 2022-25"

The ToC framework used by the Ministry of Agriculture, Nature and Food Quality (LNV) for its mission-driven innovation programmes on agriculture, food and water comprises three levels:

- Output and activity (term: 2020-2023),
- Outcome (2030-2050) and
- Impact (2050).

A noticeable feature here is that the time horizon is comfortably long-term and there seems to be a gap between Output and Outcome.

For the 2022-2025 acceleration agenda, we have used the following time scales:

- Output and Activity (2022-2025),
- Outcome (2025-2030)
- Impact (2030).

Impact 2030

The acceleration agenda for reducing food waste aims to get the Netherlands on track to meet **SDG 12.3** by 2030 through interventions targeting relevant actors and behaviours. This ambition is on a par with the long-term quantitative impact.

Assumptions: Actors will switch to an approach based on the **sustainability of the entire food system**.

The approach to food waste during 2018-2021 was implicitly aimed at achieving long-term objectives around the efficient use of scarce raw materials. This will not be sufficient when it comes to the acceleration agenda.

If we want the acceleration agenda to contribute to a "sustainable food system in which all food has value and a small footprint", we need to take a food systems approach and place it in the context of other related transition processes.

IMPACT (2025-2030)

A sustainable food system with a small environmental footprint, and all food has value

The Netherlands achieve SDG 12.3 target of halving food waste by 2030, in:

Primary production

Processing industry

Retail

Food services

Consumers

Redistribution

Figure 12: Impact 2030.

Outcome 2025-2030

The Outcome for 2025 is for the Netherlands to meet a **new interim target** that keeps the 2030 target within reach. If we want to be on track for SDG 12.3 by 2025, we need to have already substantially reduced food waste by then. As we reach the later years of implementing the acceleration agenda, we can expect a slower rate of reduction, or diminishing returns.

Assumptions: Aside from the quantitative target, by 2025 a range of mechanisms should also be in place that will lead to further reductions. The food waste agenda 2018-21 laid the foundations for tackling waste in the Netherlands.

By 2025, the scaling-up phase needs to be in full swing:

- For waste attributed to consumers, the acceleration agenda will focus on the **out-of-home** segment (food service) and on opportunities within the **retail segment** to make **conscious purchasing and consumption choices** that contribute to waste.
- For industry, the focus is on encouraging **supply chain managers**, especially supermarkets and wholesalers, to implement **preventative measures across the supply chain** as a “normal” part of business operations and supply chain management, and on creating incentives in the form of **science-based targets** (based on partnerships supported by investors and other stakeholders).
- This broader approach emphatically includes **primary producers**. For primary producers, the focus is on participation in the waste agenda. Food waste on farms, in the horticulture sector and in the fishing industry must all be included in the definition of avoidable losses. Efforts will focus on ending the practice of food being destroyed, and instead ensuring it is valorised through **direct, local channels and initiatives**.
- For the national government, the focus is on embedding food waste reduction in **coherent policy agendas** around climate-smart and sustainable food systems in which food is valorised to the greatest possible extent and with minimal losses. This will require a shift from **kilos to impact** for CO₂ emissions and other system objectives.

Outcome (2025)

Interim target in 2025 of (35%) reduction of food waste, including obligatory monitoring of process

Removing incentives in order to minimize food waste and to maximize valorisation

Tipping point for businesses: reducing food waste becomes a necessity, not a nicety

Consumers change behaviours and food routines to reduce food waste

Avoided food waste accounts for climate change targets

Chain approach for science-based targets, coordinated from retail and buyers' organisations with suppliers

Scaling consumer oriented innovation with institutional players and municipalities

Including primary production from a circular vision on biomass resources

Figure 13: Outcome 2025-2030.

Output and activity (2022-2025)

Basis: Intensification of current Food Waste Free United (STV) interventions and roadmaps:

1. Monitoring progress and impact: measurement by means of both an individual and collaborative approach
2. Working together to reduce food waste in the supply chain: stakeholders and trailblazers pool their capacity, networks and knowledge in order to develop innovative solutions
3. Working together to reduce food waste among consumers: sustainable behavioural changes by means of campaigns, interventions, living labs
4. Changing the rules of the game: strengthening legislation and tools for a circular economy

Additional activity clusters: specifically targeting acceleration and scaling-up for 2022-2025

- Broader and more elaborate monitoring
- Inclusion of the primary production sector
- Consumer-focused innovation in the food environment
- Scalable supply chain approach
- Hands-on government participation

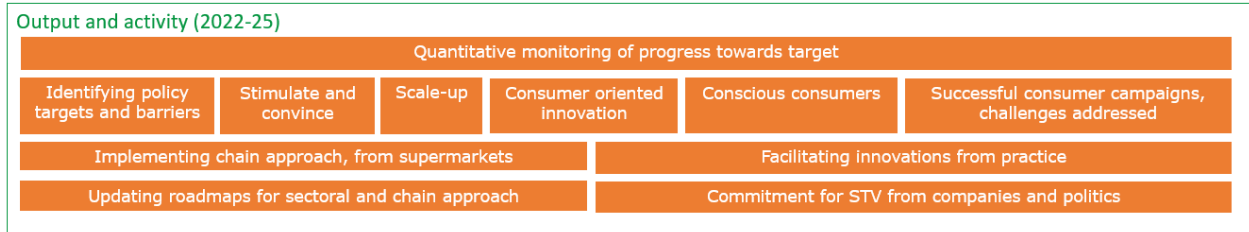


Figure 14: Output and activities 2022-2025.

3 Recommendations for the Acceleration Agenda

The recommendations in this report are divided into overarching recommendations and cluster-based recommendations, in line with the formulation of outcomes and activities as described in the ToC approach in the previous chapter.

3.1 Overarching recommendations

1. Focus on an integrated approach to help the Netherlands achieve food management transitions.

- a. Develop a Vision of the Dutch Food System 2030-2050 as a benchmark for choosing short- and medium-term measures.
- b. Make a clear commitment to setting a mandatory target within the European Union and to lobbying positively for this among other member states.
- c. Establish quantitative, interim targets per sector for 2025 in order to enable timely interventions if progress is slow (see Table 4).

Table 4: Projection of food waste reduction by 2030.

	Required rate (linear projection)	Current rate at 2.9%/year (min. range)	Current rate at 1.3%/year (max. range)
2015	0%	0%	0%
2019	15.6%	14.5%	6.7%
2022	25.0%	23.2%	10.6%
2023	28.1%	26.1%	11.9%
2025	34.4%	31.9%	14.5%
2030	50%	46.4%	21%

2. Build on the current, successful approach, supplement this with activities that can help accelerate progress, and evaluate the efficacy of measures taken in terms of how they contribute to reaching the target and their potential scalability.

The current interventions and approach being implemented through the multi-actor, multi-level collaborative platform Food Waste Free United (STV) are effective in initiating and driving food waste reduction¹⁶. This involves:

- Monitoring and reporting food waste: companies are encouraged to monitor their food waste; in addition, the Netherlands Food Waste Monitor is conducted annually and the Household Food Waste Monitor is conducted every three years.
- Food Waste Free United's work in the supply chain: a variety of activities take place to reduce food waste at companies by preventing waste and improving the valorisation of waste streams, e.g. by encouraging innovations.
- Food Waste Free United's work among consumers: efforts are made to motivate consumers to reduce their own waste; these involve the provision of practical tools through, for example, consumer campaigns, interventions and within school programmes.
- Creating an inventory of statutory obstacles: an inventory has been made of laws and regulations that impede companies from reducing food waste.

3. Make it clear that this really is no longer optional.

¹⁶ See also: Planted a seed? | Report | Rijksoverheid.nl

The current approach focuses on the known underlying causes of waste, including inefficiencies in the supply chain, imbalances of supply and demand, and unsustainable production and consumption patterns. Initiating change requires not just technological innovation but also changes in awareness, behaviour and governance as a way of reducing waste. This goes hand in hand with measuring and reporting progress and impact in accordance with a variety of indicators. An integrated approach would be based on the environmental, economic and social impacts of waste, a good understanding of how the food system is organised, the links with other policy objectives, and how stakeholders interact with each other. There are also limitations to this approach. It's not a framework specifically intended or suitable for transition thinking or systemic change. While it provides opportunities for backcasting from major future objectives, it has no underlying vision of principles, such as circularity or radical changes to the food system, that recognise the complexity of reducing waste. Indeed, this is not just about achieving lower figures for waste; rather, it's about improving the way we use food and the raw materials used in production and consumption. After all these years, there's still more of a focus on what we don't want, rather than what we do want. A long-term vision of a Dutch food system should articulate how we want to manage food and the rules and standards we want to apply.

The recommendations offered in this report are based on a review of the existing approach, drawing on examples from other countries, parallel transitions and the open stakeholder consultation.

3.2 Recommended roles for the government

This report outlines provisional recommendations to the Dutch government, and in particular to the Ministry of Agriculture, Nature and Food Quality (LNV). The underlying research revealed clear opportunities for the government to get involved and play a role in accelerating the tackling of food waste. Four appropriate roles are described below. We recommend that the government take on different roles depending on the intervention.

1. The Authority

Take a less voluntary approach, and set expectations for demonstrable progress. There are several options here, including:

- Monitoring and self-reporting at the company/sector level;
- Adoption of Key Performance Indicators (KPIs) with respect to:
 - o Related policies
 - o Existing management and certification systems
 - o Mandatory waste plan for the private sector
- Calling for binding EU targets as part of the current European consultation for new legislation;
- Prioritising forms of valorisation for waste streams that are more effective than fermentation;
- Improving opportunities, accessibility and feasibility of donation to food banks and other charitable organisations. There seems to be little support among donors or recipients for legislation to make this mandatory (in line with the French model), but there is room for scaling up. Improvements to infrastructure and operational necessities are a key focus area here. Financial support in areas such as collection and storage would be desirable.
- Preventing overconsumption, for example by banning volume discounts: retailers are not going to voluntarily stop trying to attract customers in this way;
- Having waste criteria included in investments or loans through financial institutions and investment funds (e.g. following the example of impact funding, or Rabobank's SDG loan);
- Introducing internal procurement policies for food-related activities, at all levels of government.

A caveat to this role is that obligations can also have counterproductive effects. It's therefore important that this role be constantly monitored for its effectiveness and efficiency. There isn't always enough information available to estimate the specific impact of obligations within the context

of the Netherlands. In particular, when obligations are embedded in legislation, there will need to be room for interim evaluations and adjustment wherever necessary.

2. The Obstacle Remover

- Offering space to experiment with new concepts for the speedy and accurate processing of waste streams, particularly with regard to using waste streams for animal feed. Be transparent about this as well, to attract a wide range of interested parties.
- Contributing to active lobbying at the national/EU level for the expansion of legal options at the interface of human/animal health, food and feed safety and food waste, including legislation on animal by-products, food safety, and various standards for contaminants, and microbiological and chemical substances. This could also include issues such as vaccinations and zoonoses in farm animals¹⁷. Doing so will require cooperation with relevant departments within Dutch and European government institutions, as well as making use of the parliamentary route.
- Removing import tariffs or criteria that – intentionally or unintentionally – incentivise wastage (with due regard to food safety).
- Where competition rules are found to be obstacles to an integrated supply chain approach, they should be assessed on a case-by-case basis.

A caveat to this role is also the constant monitoring of effectiveness and efficiency. There's often a specific reason and background to existing barriers, and they may be justifiable from a different perspective. Any reassessment should therefore take a plural perspective and must be coordinated with different stakeholders.

3. The Accelerator

- Expressing greater urgency, keeping the issue high on the agenda, and linking it to other objectives that can also more readily be achieved if waste is reduced (specifically: climate targets, protein transition, biodiversity, circular agriculture and circular economy).
- Proactive interlocutor.
- Sharing good examples and resources for interventions, including at the provincial/municipal level, and doing so in a way that responds to the needs of organisations so that the examples resonate with them and they can start to take action themselves.
- Encouraging the STV / multi-stakeholder platform approach for other countries; serving as an example will mean our own performance remains constantly in the spotlight.
- Focusing on initiatives that demonstrably contribute to a reduction in waste.
- Promoting fair pricing and transparency: a wasteful system should be more expensive/unappealing than one with zero waste.

A caveat to this role is making impact visible and measurable, so that successful examples and initiatives have more room to grow.

4. The Collaborator

- The systemic nature of food waste makes collaboration with other ministries a necessity. This calls for an intensification or re-intensification of inter-ministerial cooperation, and establishing shared responsibility across ministries.

A caveat here is that a ministry cannot be held responsible for a component or approach located beyond its own remit.

¹⁷ Note on the relationship with food waste: vaccinations can prevent outbreaks of animal diseases (zoonoses), reducing the need to cull animals and making more of them available for the food system. Vaccination is relevant not just from a veterinary perspective but also in terms of rules related to exports.

3.3 Recommendations by cluster

3.3.1 Monitoring objectives

The monitoring and reporting of food waste is a key part of tackling the issue. Since 2009, the quantity of food wasted in the Netherlands has been monitored annually at national level, broken down by unavoidable, potentially avoidable and avoidable waste streams and by their destination according to Moerman's ladder (donation, animal feed, fermentation, composting, incineration, landfill). Since 2018, efforts have been made in collaboration with Food Waste Free Unite (STV) under Intervention 1 ("Measuring Together") to incentivise self-reporting by individual businesses and by sectors as a whole, as well as to increase transparency and take targeted action against waste hotspots. As of 2022, it's mandatory for all European member states to provide static data on waste at the country level, with optional scope to also report data at the sectoral level. 2020 is used as the baseline year. Benefits of monitoring: a better understanding of the scale of waste and where it occurs, thereby facilitating the development of a targeted approach.

Accelerate to 2025:

- **Put more pressure on companies to increase their participation in reporting at the organisational, sectoral and individual supply chain actor levels.**
- **Improve data quality (representativeness, interpretation, wider criteria).**
- **Establish interim milestones for specific supply chain actors and sectors.**

Measures that could contribute to this:

1. Requiring **transparent reporting** at different levels: individual supply chain actors, sectors and at the organisational level. This would improve the transparency of the food chain, improving our ability to identify and address inefficiencies.
 - a. A link to the upcoming mandatory sustainability reporting under the European Corporate Social Responsibility Directive (CSRD)¹⁸, which will be introduced in several phases from 2024 as a follow-up to the Non-Financial Reporting Directive (NFRD)¹⁹. The exact requirements in terms of information to be provided have not yet been determined. Given the relevance of waste to both environmental and social parameters, and the inclusion of food waste in the broader waste category, there is scope to include a paragraph on mandatory waste here. The options around this need to be further explored, including in a European context.
 - b. A link to the introduction of the European legal obligation to reduce waste. Impact assessment and negotiations are taking place this year, with implementation due to be effective from 2026 at the earliest.
 - c. Encouraging the inclusion of waste criteria for loans and investments from investors (such as impact investors), financial institutions, etc.
 - d. Encouraging the inclusion of waste indicators (KPIs) within existing management systems, quality labels and certifications, such as quality management, procurement criteria and the hospitality industry hygiene code.
 - e. Investigating the impact of compulsory legislation on means-tested interventions (including obligatory donations as per the French model since May 2015²⁰).
2. Aiming to **elaborate, broaden and support** the monitoring of waste and its environmental and socio-economic impacts.

¹⁸ For more information, see: https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en

¹⁹ See the relevant directive here: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32014L0095>

²⁰ See the relevant legislation here: Gaspillage alimentaire | Ministères Écologie Énergie Territoires (ecologie.gouv.fr)

Elaborate:

- a. Quantitative indicators for **environmental impact** (greenhouse gas emissions), **economic impact** (euros), **nutrient losses, land use and soil fertility**. This will also statistically provide data substantiating the links to related policies, and enable calculations of the potential contribution to and impact on achieving multiple goals. This calls for additional research funding, preferably with the involvement of relevant food system stakeholders.

Broaden:

- b. Measure food losses and their causes in the **primary production sector**. This requires the development of additional methodologies that are aligned with the current monitoring method. A four-year Horizon Europe project on this topic was launched in 2022, but our recommendation is not to wait, and to demonstrate that the Netherlands is taking the initiative here as well. As well as increasing the involvement of Dutch agriculture and fisheries, monitoring results can also contribute to policy development at the European level.
- c. Clarify **losses in countries of origin caused by exports to the Netherlands (and possibly transit countries)**, including CO₂ effects ("emission leakage").
- d. Develop and publish a **public benchmark** like the one made available to the retail sector in 2021 and 2022. This allows companies to assess their performance against their peers.

Support:

- e. Establish **interim objectives for individual supply chain actors and sectors as a whole**, providing insight into the number of companies participating and their representativeness vis-à-vis the market and their share of waste in the supply chain.
- f. Make **information and/or guidelines** for monitoring – including interpretations of definitions, measurement methods, and data quality – available and easily accessible. Wherever possible, use common industry communication channels, and involve Food Waste Free United (STV).
- g. Encourage the development of **automated recognition/tracking** of waste streams, including increasingly advanced/detailed information on composition. This will open up opportunities for higher-value applications, as well as information to help companies themselves reduce their waste.

3.3.2 Inclusion of the primary production sector

Although losses on land and water do not officially count in the legal definition of waste, a significant proportion of all food produced never reaches the food chain. These losses have a variety of legal, commercial and natural causes. As the primary production sector is the real starting point for the Dutch food system, it must also be an integral part of possible solutions to reduce waste in the system. The sector is facing some major challenges and is therefore under a lot of pressure. Trailblazing companies are increasingly demonstrating that it is in fact possible to operate in a regional and circular way, with zero waste, and to participate in high-value supply chain concepts.

Accelerate to 2025:

- **Specific actions aimed at reducing losses in agriculture and fisheries.**
- **Ensure that actors in the primary production sector are on an equal footing vis-à-vis other actors in the system, in order to achieve a better match between supply and demand.**
- **Expand legal options for using plant and animal waste streams as animal feed.**

Measures that could contribute to this:

3. Making food loss and waste an **integral and explicit part of agricultural policy**, such as circular agriculture, regional development and thematic policies. This could include nitrogen policies and fertiliser legislation. Doing so will contribute to the long-term viability of the agricultural sector and the scale of animal production systems.

-
4. **Improving the market position** of actors in the primary production sector.
 - a. Improving the **visibility** of and providing a platform for **trailblazers** to push for a switch to circular supply chain concepts.
 - b. Developing a **joint approach against unfair commercial practices** in relation to private marketing standards and contract terms, including instances of last-minute cancellation and rejections based on cosmetic factors.
 - c. Creating **access to new/alternative markets** for products that would otherwise be unsold.
 - d. Improving **bargaining powers** with buyers by:
 - i. Increasing **transparency** around market prices;
 - ii. Focusing on **flexibility** regarding cosmetic product specifications and classifications in the terms and conditions used for suppliers and marketing standards, promoting the social acceptance of new marketing standards as a new social norm;
 - iii. **prohibiting** cancellation contracts or only allowing deals where the entire crop/harvest is purchased (preferred supplier).
 - e. Improving **legal protections** for farmers and fishers so they can negotiate fair prices.
 5. Permitting and encouraging the use of **plant and animal waste streams** as animal feed.
 - a. Targeted, active lobbying in European working groups and in parliament to promote **amendments to the European legislation** on animal by-products. Where necessary, funding additional scientific research on safety aspects and on acceptance within the supply chain and among consumers, preferably through comparative studies with other member states.
 - b. Promoting the use of suitable and permitted waste streams in animal feed wherever this is not yet being done, or is being done only in a limited way. This could include retail channels, e.g. by providing **experimental space** through exemptions (temporary or otherwise).
 6. Developing an approach to losses attributed **to international trade/imports**.
 - a. Assess the scale of **losses in origin countries** related to imports, and those in the Netherlands related to exports (pre-departure). What opportunities can be identified to reduce this cross-border waste in partnership with the private sector and civil society organisations?
 - b. Assess the barriers that could be removed from **customs and/or food safety legislation** to increase the threshold for rejection without compromising the ecosystem and health risks (MRLs). Meanwhile, look into alternative high-value destinations for rejected import consignments, once they have already reached ports or airports. Currently, rejected consignments are 100% guaranteed to be wasted. What else could be done with these rejected products?
 7. Assessing whether adjustments to current **vaccination and zoonosis policies** could help prevent losses attributed to culling and other measures to avoid the spread of animal diseases, without compromising food safety or general security.

3.3.3 Across the supply chain, and system-focused

Some very specific, targeted measures can reduce waste within a company or sector, without any need for coordination or interaction with buyers or suppliers. In many cases, however, waste is a result of inefficiencies that arise between different actors within a supply chain, meaning they're a consequence of how the food system is organised. That's why we need to assess waste across the supply chain, and take a system-focused perspective. Some considerations include: 'Should everything always remain as food?', 'Which uses of waste streams do we prioritise?', 'What is the overall picture of how we use biomass?'. At present, it's not always clear whether a reduction of waste in one part of the system has been achieved at the expense of more waste being created in other parts of the supply chain. There's also the issue of competing claims on the available biomass (e.g. waste streams being used for bioenergy and biomaterials in order to reduce fossil fuel consumption and import dependency), along with the problem that we aren't currently able to deliver high-value uses for complex organic waste streams. Because this is such a complex

issue, many companies and organisations still don't consider waste to be an urgent problem. They don't see what they can do about it. Indeed, the negative outcomes of waste aren't always visible: people don't see it reflected in the true price of production.

Accelerate to 2025:

- **Establish agreements around preventing and reducing waste across the whole supply chain.**
- **Address the appropriateness, prioritisation and options for using food waste streams in different ways.**
- **Increase the sense of urgency and ownership among a wider group of businesses and organisations: there's a positive business case for tackling waste!**
- **Introduce financial incentives for a waste-free supply chain**

Measures that could contribute to this:

8. Encouraging **better supply chain cooperation and logistics**:
 - a. **Increasing awareness** of losses/waste streams arising between participants in the supply chain, e.g. around delivery specification requirements (cutting methods, remaining shelf life) to avoid shifting waste along the supply chain, and of how better estimates of required quantities can help reduce overproduction.
 - b. **Improving the development of short supply chains**, using supplementary research and highlighting good practices to identify the advantages and disadvantages of short supply chains in reducing waste.
 - c. **Developing and supporting the international 10x20x30²¹ approach and also actively communicating it and calling for participation.** This will encourage supply chain participants to jointly look for solutions and to come up with responses based on any hotspots they identify. It could be done in parallel to STV's existing cluster approach (e.g. around bread and circular animal feed) and could be a prelude to scaling up.
9. **Fair pricing**: internalising the true price of production, including the impact of food waste, in food prices. This makes companies more aware of the cost of waste, and encourages them to take measures to improve their practices.
 - a. Requiring transparency regarding **cost structures** in the supply chain.
 - b. **Using incentives (including financial ones)** to encourage companies to reduce waste through, for example, a system of carbon credits or the introduction of tax credits for those who can demonstrate the extent to which their waste-reduction measures have proved effective. A relevant issue here is the need to develop a verifiable and reliable system, and to also consider opportunities to join in with European initiatives.
 - c. Conducting supplementary research to calculate and test the **knock-on effect of price incentives** ('bad' being more expensive and/or 'good' being cheaper) on wastage.
10. **Preventing greenwashing** by requiring (scientific) evidence that 'waste reduction' claims are attributable to the effectiveness of particular strategies. Businesses must be encouraged to be transparent about the measures they use, including sharing targets and the actions they take. Participation in third-party certification can enable their efforts and the environmental benefits to be verified.
11. Encouraging the **development of technological (or other) solutions for complex organic waste streams**, both in terms of collection and processing. At present, the recycling sector isn't sufficiently engaged with efforts to reduce waste. How can the separation of the organic fractions of municipal solid waste (at source or later) contribute to new or higher value fractions? Focus on developing new technologies, including bio-refinery. It will be helpful to draw up a timeline, e.g. for plant-based (2025), mixed (2030), wet residues (2035).

²¹ For more details, see for example: <https://champions123.org/10-20-30> In a 10x20x30 initiative, 10 companies each commit to working with 20 of their key suppliers to halve waste by 2030.

-
12. Exploring the impact on waste reduction of modifications to **standards in the context of food safety**.
 - a. When Maximum Residue Limit (**MRL values**) are set, we should be considering the effects of dilution on these maximum values and whether these effects are a good thing. If you keep diluting, at some point the problematic substance is no longer measurable.
 - b. Clarifying grounds for **reconsidering limits and standards**, based on supplementary research and consultation with relevant businesses.

 13. Encouraging the **involvement of Dutch civil society** in the issue of food waste.
 - a. Emphasising the **relevance and urgency of the topic**, and how it relates to the stated priorities of civil society organisations.
 - b. Improving **funding opportunities** for campaigns or social initiatives aimed at reducing waste among consumers, especially among vulnerable groups; either through their own resources or through private institutions/funds.
 - c. Modifying the **social norm** in the supply chain, so that zero waste is considered normal, and waste is something to be avoided.

3.3.4 The food environment and consumers

The vast majority of waste surveys identify consumers as being a segment of the food system where a lot of waste occurs. This has naturally led to a strong focus on consumer-facing measures both in the Netherlands and across Europe. These measures often involve educating consumers to improve their understanding of how to buy, cook and store food without creating waste (including an understanding of expiry dates). Alongside this active engagement of consumers, it can also be useful to make positive interventions in food environments where there's scope for modifying consumer behaviour, especially when the two approaches are combined.

Accelerate to 2025:

- **Continue and where possible intensify information and education campaigns targeting consumers, especially those groups that (so far) are unaware of the issue or don't participate in sustainability endeavours.**
- **Expand the role of the private sector in empowering consumers to avoid waste by offering 'zero waste' products and information on how to avoid waste.**

Measures that could contribute to this:

14. Continuing and intensifying the long-term funding of **consumer campaigns**, based on social norms and an understanding of the drivers of behavioural change. These can focus on different target groups and on product groups with the highest levels of waste (bread & pasta, vegetables, fruit, potatoes and dairy; and products with high environmental impacts, including meat and meat products, dairy, coffee and tea).
 - a. **Educational programmes** for groups such as schoolchildren, young adults, and families with young children, among others. These can be oriented towards integrated food programmes (healthy, safe, sustainable), and draw on examples of successful programmes from other countries (e.g. China's 'food waste education programme'²²).
 - b. **Targeted:** focus also on target groups behind the trailblazers, using appropriate incentives and measures.

15. **Improving the food environment** of consumers by **activating and supporting the private sector** in developing, implementing, testing and scaling up:
 - a. Making a **zero-waste product range an easy option for consumers** (portion sizes, packaging methods [shareable/sealable/smart], TTI indicators, diversity of products, non-standard 'sharing'/portioning methods for animal (or other) products, unusual products).

²² For more information, see: <http://en.people.cn/n3/2020/0903/c90000-9747296-6.html>

- b. Expanding the use of **support tools** that help people improve the way they shop/cook/store (e.g. 'Food buddy', shopping list, etc.)
- c. Encouraging the development of **action packs for the hospitality industry**.
- d. Encouraging **targets for sustainable and/or local food and combining them** with waste reduction. This should be done in coordination with the Ministry of Health, Welfare and Sport (VWS).
- e. **Expanding the use of consumer information**, specifically on waste (e.g. visual cues/icons for expiry dates). Follow-up research on this will be conducted by WUR in 2023 through a practical pilot with the private sector. It's also important to consider ways of piggybacking on other forms of consumer information, including for example Eco-score (on the environmental impact of products), and expanding these to include waste criteria. Research is currently being done into this as part of the EU project ZeroW, involving the Dutch Nutrition Centre and WUR.
- f. Improving the **separation at source of fruit, vegetable and other types of organic waste**, especially in urban areas.

16. Organising a broad social debate on the **role of safety within the food system**, to raise consumer awareness of potential food hazards and risks and in turn reduce the amount of food that is needlessly thrown away.

3.3.5 Policy coherence

Good policy is a prerequisite for preventing waste. Being inextricably linked to climate and energy, it's important to build waste reduction explicitly into those essential transition processes for them to succeed. Specific themes include climate, energy, nitrogen, methane (manure), fermentation and broader discussions around the use of waste streams and the prioritisation of available biomass in the context of secure and resilient agri-food systems, the circular bio-economy, packaging, waste management, agriculture and animal feed.

Accelerate to 2025:

- **Action- and impact-oriented, with faster modification of policies to enable that.**
- **Interdepartmental cooperation: constructive consideration of other departments' objectives and approaches.**
- **Less voluntary action and more penalties and pressure backed by legislation.**
- **Learning from other countries: what works?**

Measures that could contribute to this:

- 17. **Encouraging action:** from planning to execution, working with supply chains
 - Show that it can be done: organise and **showcase model projects** based on at least two supply chains that set an example.
 - Make **successful practical interventions** clear and accessible to others: learn from what's being done in practice, and in other countries.
 - Be bold and **experiment** with solutions found outside the existing (Dutch) policy framework. For example, in the UK, 'surplus' has been designated as an intermediate category between food and waste, allowing for a reorientation of the precautionary principle in our laws around food and consumer product safety.
 - Draw attention to Dutch model projects **in European and international lobbying/platforms**.
 - Offer room for experimentation by adopting a **proactive attitude and short lead times** for making decisions.
- 18. **Embedding waste policy in related policy areas as well as in the national government's interdepartmental food policy**
 - a. The Ministry of Agriculture, Nature and Food Quality (LNV) is not solely in charge of all relevant policy areas and legislation: these are complex issues involving several departments. **Interdepartmental cooperation** is therefore essential. Discuss openly any bottlenecks that stand in the way of contributing to related transitions.

- b. **Linking food waste to related transitions** such as the circular economy and climate calls for effective coordination with relevant policy departments. The obvious relationships are with:
- The politics of agriculture and fisheries, including biomass (Ministry of Agriculture, Nature and Food Quality, LNV)
 - Energy transition and climate action (Ministry of Infrastructure and Water Management, I&W)
 - Public health including food safety (Ministry of Health, Welfare and Sport, VWS)
 - Circular economy including waste management (Ministry of Infrastructure and Water Management, I&W)
 - Living environments and environmental objectives, including packaging (Ministry of Infrastructure and Water Management, I&W)
 - Food security and social cohesion (Ministry of Agriculture, Nature and Food Quality, LNV; Ministry of Health, Welfare and Sport, VWS; Ministry of Social Affairs and Employment, SZW)
 - Entrepreneurship policy and the politics of innovation (Ministry of Economic Affairs and Climate, EZK; Ministry of Foreign Affairs, BuZa)
 - The food and biomass sectors are not included in the current **Circular Economy policy programme**. This omission should be **rectified as part of the next revision**. This omission is symbolic of many other missed opportunities, where the Ministry of Agriculture, Nature and Food Quality (LNV) might otherwise have made progress on reducing food waste through related policy areas.
 - The Ministry of Health, Welfare and Sport (VWS) is pursuing policy objectives on waste (especially among consumers), food security and food safety, and these are opportunities for the Ministry of Agriculture, Nature and Food Quality (LNV). The Ministry of Agriculture, Nature and Food Quality (LNV) needs to **take on and acquire or get more of a leadership role** in interdepartmental cooperation.

19. More **government pressure**

- a. Active lobbying for **stricter requirements and less optional participation** from the EU, for example around
- i. **Monitoring** waste
 - ii. **Mandatory targets** for halving waste (Flagship Initiative of the Farm to Fork Strategy to propose binding targets²³)
 - iii. Statutory framework for **sustainable food systems** (Flagship Initiative of the Farm to Fork Strategy to propose a legal framework for sustainable food systems FSFS)²⁴
 - iv. **EU taxonomy for investment**, outlining which economic activities contribute to climate change mitigation and how to determine whether an economic activity may have significant negative impacts on other environmental objectives²⁵
 - v. **Common Agricultural Policy** (CAP) and Common Fisheries Policy
 - vi. Revision of **EU marketing standards** (Initiative to revise EU marketing standards for agricultural products)²⁶
- b. Showcase **inspiring examples** and organise **positive lobbying** for targeted obligations.

²³ See information on this policy process here: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13223-Food-waste-reduction-targets_en

²⁴ See information on this policy process here: https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy/legislative-framework_en#:~:text=The%20proposal%20for%20a%20legislative,to%20sustainable%20food%20systems%20easier

²⁵ See the full EC/2021/2800 directive here: https://ec.europa.eu/finance/docs/level-2-measures/taxonomy-regulation-delegated-act-2021-2800-annex-1_en.pdf

²⁶ See information on this policy process here: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12772-Agricultural-products-revision-of-EU-marketing-standards_en

4 International examples

4.1 National programmes by EU member states

The EU Platform on Food Loss and Food Waste recently launched the EU Food Loss and Waste Prevention Hub as an online resource for sharing and making accessible relevant information concerning good examples, strategies, evaluations, etc. The website of this Prevention Hub also features an overview of national programmes in members states to tackle food waste. Visitors to the site can also see the main actions and objectives established by each country.

See below for the information provided by the Netherlands to the Hub²⁷:

Member State Page : Netherlands

Report



Food waste data – national:
Per capita: 161 kg in 2020
In total: 2 811 000 tonnes in 2020



Food waste data – sectoral:
Primary production: 463 045 tonnes in 2020
Processing and manufacturing: 1 million tonnes in 2020
Retail and other distribution of food: 209 805 tonnes in 2020
Restaurants and food services: 83 035 tonnes in 2020
Households: 1 million tonnes in 2020



Targets:
Halve food waste by 2030 and reduce food losses

Contact point

- [Ministry of Agriculture, Nature and Food Quality](#)
- [Food Waste Free United Foundation](#)

Target

In several policy documents, the Dutch government has confirmed its commitment to achieve the Sustainable Development Goal Target 12.3 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.

²⁷ See: European Food Loss and Waste Prevention Hub (europa.eu)

Measure

The first national monitor on total food waste in the Dutch food supply chain was published in 2009 and it has been updated annually. The Ministry of Agriculture, Nature and Food Quality commissions the national monitoring, which is done by the Wageningen Food and Biobased Research Institute. The most recent data from 2018 indicate an average of 123 kilos of food waste per capita (minimum 96 kilos and maximum 149 kilos). The total amount of food waste has on average declined by 6 kilos per capita per year. This monitor does not include data from households.

There is a separate monitor on households' food waste in the Netherlands, which is repeated every 3 years. Since the first monitoring carried out in 2010, a reduction of 29% has been achieved. In 2010, 48 kilos of food were wasted per person, decreasing to 41.2 kilos in 2016 and to 34.3 kilos in 2019. There has been a particularly strong reduction in the wastage of bread, dairy produce, fruit and vegetables, although these food types still remain among the most discarded products by consumers. In addition, a lower volume of drinks was poured away via the sink or toilet (45.5 litres of fluid per person in 2019, as compared to 57.3 litres in 2016).

In 2018, the Netherlands focused on collecting food waste data from the retail sector, as well as information on the amount (kilos) of sold food per product group and destinations, covering large Dutch supermarkets (83.8% net turnover from the whole market share in 2018). The results of the study showcased that:

1. potatoes, vegetables and fruit have the highest contribution to supermarket food waste (34.5%), followed by bread and pastry (31.5%) dairy, eggs and chilled convenience products (13.3%);
2. the total food waste accounts for 1.7% of the amount sold;
3. the main waste destinations are biogas, composting and animal feed; and
4. 5-10 product groups are responsible for 80-90% of food waste.

As regards the 'out-of-home' sector, researchers prioritised measurement activities on the hospitality sector, restaurants, companies, fast services, institutions and fuel stations. A food waste challenge was organised for restaurants. Regarding company catering, previous studies showed that display waste levels are the most significant, whereas more recent studies revealed that kitchen waste is almost comparable to the former and should not be neglected when collecting data.

In relation to other sectors of the food supply chain, Wageningen runs questionnaires among primary producers and fruit and vegetable trade organisations, and they have also developed sector specific measurement templates with 1-2 companies, which are representative for the sector.

The Netherlands estimates food losses in the primary sector based on an existing database.

Act

Combating food waste is a priority for the Dutch government, who actively collaborates with actors across the food supply chain (companies, research and non-governmental organisations) to reduce and prevent food waste through the [Food Waste Free United Foundation](#) **voluntary agreement**. Its signatories are committed to achieving the Sustainable Development Goal Target 12.3. The government facilitates and supports actions in this field and regularly reports to the parliament on the implementation of its food waste prevention agenda. The focus of the Dutch policy regarding food waste is on (1) preventing the occurrence of food waste (2) minimizing the amount of food waste and (3) using the food surplus that occurs according to the food use hierarchy. Actors in the food supply chain are encouraged and stimulated to use this hierarchy in order to give the highest value to their secondary resources. The Foundation started off as the 'Taskforce Circular Economy in Food', established in 2017 under the EU-funded [REFRESH project](#) to shape the national food waste prevention agenda.

The mission of Food Waste Free United Foundation is to be a catalyst for the transition to a food system without waste and food chains in which raw materials are retained in an efficient and effective manner. The members of the voluntary agreement inspire, activate and connect entrepreneurs in the food chain and consumers, in order to reduce food waste. The Foundation contributes to the national food waste prevention agenda by:

1. Monitoring progress;
2. Joining forces to combat food waste across the food supply chain;
3. Joining forces to combat food waste by consumers;
4. Changing the rules.

The climate agreement introduced a number of measures to strengthen the Food Waste Free United Foundation voluntary agreement. Measures include the provision of a yearly budget of €1 million to help increase the reach and impact of food waste prevention awareness campaigns aimed at consumers and companies, as well as commitments from signatories of the voluntary agreement to actively engage 80% of their respective members in the work of the Foundation.

The [Dutch Alliance on Sustainable Food](#) established in 2013 brings together six branch organisations covering the whole food supply chain (excluding consumers) and has a strong focus on preventing and reducing food waste and reusing secondary resources. The Dutch government works together with the alliance, increasing synergies between its members and other actors (e.g. the Dutch Association of Food Banks).

In order to save surplus food from the catering industry, festivals and exports during the Covid-19 pandemic, an online business-to-business marketplace has been established to give food a valuable destination. The online B2B Marketplace allows the reporting of available food quantities, linking supply and demand, crowdsourcing solutions. The latter means that for predicted large flows without demand, solutions are sought within the network of companies. Other initiatives have also been implemented to facilitate the **recovery and redistribution of surplus food** (e.g. [Fruit & Veggie Brigade](#), [Soupalicious](#)), including an online solution put in place for the HORECA sector ([InStock Market](#)). A digital platform for structural and large-scale recovery, processing and redistribution of surplus food is currently being developed in the Netherlands, based on learnings from the online B2B Marketplace developed during Covid-19.

In order to **raise awareness** about food waste among consumers, the Food Waste Free United Foundation and the Ministry of Agriculture, Nature and Food Quality launched in 2019 a national campaign called '[How #waste free are you?](#)' ([#Verspillingsvrij](#)), giving practical tips on how to prevent food waste at home. The campaign aims to reach 5 million consumers and to inspire 30% of the Dutch population to actively reduce their food waste. The campaign is supported by a large group of media influencers and members of the Foundation and its main target are families with young children, being the group that discards most food. Becky the mascot became the face of the campaign in order to further incentivise people to take action against food waste.

The consumer campaign continued in 2020 with **date marking** as its main theme, in order to help consumers distinguish between 'use by' and 'best before' dates and to offer them clear advice on how to treat these two different date marks, which could help them avoid about 5 kilos of food waste every year.

As a part of the campaign, every year during [Waste-Free Week](#) consumers are encouraged to be #Waste-free and to sign up and participate in various related challenges. Many actors are involved in carrying out actions during the week, helping consumers waste less food by, for example, distributing tools such as measuring cups, fridge and freezer stickers, as well as informative materials on the issue. Related activities are also carried out in schools.

The theme of reducing food waste is included in existing **educational materials**, namely Taste Lessons, 'Know what you eat' and the Citizenship Course, being linked to education about healthy nutrition, food safety, origin and sustainability. Specific challenges are held in which students in secondary and higher vocational education are encouraged to come up with practical solutions to the issue of food waste.

Companies can receive **financial support** for tailor-made advice to cut food waste in their operations, by applying to the voucher scheme launched by the Ministry of Agriculture, Nature and Food Quality in 2019 and managed by Wageningen University & Research. Companies requesting a new or innovative solution can apply for a voucher of up to a maximum of €15,000 ex. VAT, where they contribute at least the same amount in cash. The solutions / innovations found are then actively shared with other companies.

In 2021, the [first loan](#) that rewards the reduction of food waste with lower interest rates was granted by the Dutch financial institution Rabobank.

In order to stimulate innovation and public-private partnership projects, Top Consortia for Knowledge and Innovation (TKI) have been set up within nine top sectors, including in the agri-food sector. In TKIs, entrepreneurs and scientists look for ways to market innovative products and services as well as solutions against food loss and waste.

The following subsections outline national programmes of or recently introduced legislation within other EU member states around the prevention of food waste. These are provided here as examples of how the challenge of reducing food waste can be tackled. Spain, Germany, France and Ireland have been chosen for the diversity of their approaches: Spain and France – legislation-oriented; Germany – dialogue-oriented; Ireland – a specific approach for 2023-2025.

4.1.1 Spain

A new law against food waste was passed in June 2022²⁸. Its main points are listed below:

Key points

- Hotel industry required to offer customers leftover food at no extra cost and in recyclable containers.
- To avoid food waste, businesses will have to determine where any food is destined to go, with the assumption that the highest priority will always be human consumption through food donation or redistribution.
- Excess donation will be regulated through partnership agreements between companies, civil society initiatives and other non-profit organisations or food banks.
- Civil society entities receiving donations need to create a system to record the receipt and redirection of any food received and delivered.
- Where food is no longer fit for human consumption, the preferred options (in order of priority) are: production of animal feed, use as a by-product in another industry, or use as waste to generate compost or biofuels.
- Commercial businesses will have sales lines dedicated to “ugly or imperfect” products.

Fines and penalties for non-compliance

- Failing to follow the priority hierarchy is a minor offence, punishable by fines of up to €2,000.
- A failure by retailers and hospitality businesses to give away unsold products suitable for human consumption in accordance with a pact or agreement is a minor infringement.
- Refusing to work with government agencies and public bodies to quantify food waste is a minor offence.
- Not having a prevention plan is considered a serious offence and is punishable by a fine of between €2,001 and €60,000.
- An accumulation of serious infringements within a two-year period is considered a very serious infringement and can be punished by a fine of between €60,001 and €500,000.

²⁸ Source: La Moncloa. 07/06/2022. Government of Spain approves pioneering law against food waste [Government/Activity of the Council of Ministers]

4.1.3 Germany

National strategy for food waste reduction (2019)²⁹ [in English]

Approach: strategy reflects the fact that reducing food waste is a task for society as a whole. Civil society, industry, administration and scientists are therefore called upon to become involved in the implementation.

1) Policy framework

- Federal Government/Lander body
- AG Indikator SDG 12.3 working group on reporting
- Overarching national dialogue forum
- Sectoral dialogue forums

2) Process optimization in the industry

- Analysis of production processes in order to determine where food waste arises and measures can be deployed.
- Regular monitoring and adapting of business processes in order to minimise food waste during production and transportation.
- Promotion of innovations that improve processes with respect to waste reduction and acceleration of their implementation in practice.
- Incorporation of action against food waste into routine corporate activities.
- Consideration of measures to prevent food waste through innovative logistic systems, e.g. needs-based order volumes, more flexible (more frequent) delivery of goods and a redistribution of goods between branches or price adjustments.
- Analysis of the interfaces between the sectors and development and implementation of cross-sectoral measures in the dialogue fora.
- Enhancement of transparency along the food supply chain via the provision of data on the recording of food waste in consensus with the actors of the food supply chain.
- Examination of inclusion of relevant interest groups and options for cooperation.
- Review of marketing and advertising claims with regard to their impact on the appreciation of food and the associated food wastage.

3) Changes in the behaviour of all sectors

- The BMEL's Too good for the bin! initiative will be further developed to become the umbrella brand for communicating the National Strategy for the whole food supply chain.
- Social media such as Instagram, Twitter and Facebook are increasingly used in communication, particularly in order to reach adolescents and young adults.
- Food business operators are called upon to continue to integrate the subject into initial and further training schemes, raise the awareness of staff and customers regarding food wastage and increase know-how on how to prevent food waste.
- Schools and day-care centres for children are integrating the subject into educational materials (education and training curricula, project work) on sensitising and raising the awareness of children, adolescents and young adults.
- Training of teaching staff and development of proposals for materials and methods for all federal states in order to integrate the subject of food appreciation into curricula.
- Evaluation of the application, acceptance and effectiveness of teaching material in order to develop it further, as appropriate.
- Successful activities and projects run by the federal states will be continued.

4) Potential arising from research and the digital transformation

Digital innovations should be analysed with regard to their benefits within the food supply chain, from primary produce right up to the consumers. The high transparency, decentralised data networks, swift data availability and traceability aspect should also be used to reduce food wastage

²⁹ Source: https://www.bmel.de/SharedDocs/Downloads/EN/_Food-and-Nutrition/Strategy_FoodWasteReduction.pdf?__blob=publicationFile&v=3

4.1.4 France

Garot Law (2016)³⁰ [in English]

In February 2016, France adopted a pioneering law on fighting food waste that meant supermarkets were forbidden to destroy unsold food products and were compelled to donate it instead. This law constituted the starting point of the fight against food waste through banning its destruction and facilitating donation. Since the adoption, its scope has been extended further, as defined through new decrees and laws.

This "Garot Law" established an anti-food waste action hierarchy in the following order:

- Food waste prevention through discounts and awareness raising...
- Donation to charity organisations
- Animal feed
- Composting or anaerobic digestion
- Disposal

It includes the following measures:

- Obligation to establish a partnership with a charity organisation to donate unsold food products, for supermarkets of more than 400 m²
- Food retailers are forbidden to destroy unsold food products still fit for consumption

Extensions in 2019³¹:

- Extension of the obligation to donate unsold food products to mass catering (preparing more than 3,000 meals a day) and the food industry (whose annual turnover exceeds €50 million)
- Extension of the ban of destruction of unsold food products fit for consumption to mass catering and the food industry
- Obligation to offer a doggy-bag option for commercial catering
- Obligation for some actors in the food industry and mass catering sector to make publicly available their commitment to reduce food waste

The anti-waste law (2020)³²

This law, aimed to achieve a circular economy was voted upon at final reading in both Houses, following a conclusive Joint Committee which concluded this autumn's debates in the Senate and then in the National Assembly. This law is the outcome of a wide consultation with all the stakeholders (local authorities, companies, NGOs) launched in October 2017 and the result of a broad political consensus involving most of the political groups in the Parliament.

It largely responds to the expectations of our citizens with respect to ecology through daily life measures with a concrete ecology which preserves resources, health, purchasing power, and economic and industrial development in the regions.

The law contains about fifty measures providing for:

- new obligations with the creation of new Polluter pays sectors to include new product families in the circular economy (toys, sports and do-it-yourself equipment, building materials, cigarette butts, sanitary textiles) and the requirement of transparency on the environmental and health impacts of products, on waste management;
- new prohibitions to control irreversible ecological ambitions, particularly on the use of single-use plastics and to combat wastage of both food and non-food unsold products.
- new tools to better control and sanction offences against the environment (greater power of the Mayors to fight against littering and illegal dumps), to support companies in their eco-design initiatives (with bonus/malus-type incentive systems) and assist citizens in new consumption practices (repairability index, information on endocrine disruptors, simplifying the sorting process, development of deposit-systems).

The national waste prevention program includes several measures to reduce food waste and it ensured continuity of actions foreseen in the first French national pact on food waste, enforced in 2013. Led by the

³⁰ Source: LOI n° 2016-138 du 11 février 2016 relative à la lutte contre le gaspillage alimentaire (1) - Légifrance (legifrance.gouv.fr)

³¹ Source: Ordonnance n° 2019-1069 du 21 octobre 2019 relative à la lutte contre le gaspillage alimentaire - Légifrance (legifrance.gouv.fr)

³² Source: INSIDE_The anti-waste law in the daily lives of the French people (ecologie.gouv.fr)

French ministries in charge of agriculture and the environment, as well as ADEME, the **national pact** was renewed in 2017 until 2020 to respond to a growing concern regarding food waste and a new legislation framework. Measures from the National Pact include:

Cross-cutting measures concern all stakeholders

1. Participate in the work of the National Pact to combat food waste
2. Collaborate with State services and relay the results of work carried out jointly

Measures uniting partners according to their field of action

3. Participate in the quantification of food waste
4. Promote food donation
5. Support systems for collecting and redistributing food donations
6. Support collective catering players in a given territory in food waste prevention and food donation operations
7. Develop systems for recovering, processing and donating unsold food on public food markets
8. Promote the swarming of gleaning and participate in the development of associated best practices
9. Promote the emergence of innovative practices in the fight against food waste
10. Promote the emergence of new partnerships between actors/sectors of the food chain
11. Implement actions to prevent and/or reduce food waste internally
12. Support and participate in actions to raise awareness and educate actors within its network of influence
13. Support and participate in awareness-raising actions for the general public
14. Support the initial training of future food professionals
15. Support the continuing education of future food professionals
16. Participate in the definition of a French position on the fight against food waste supported by the State within European and international bodies

4.1.5 Ireland

National food waste prevention road map 2023-2025³³ (direct copy from original text)

Key Priority Actions for the first Roadmap 2023-2025 ⁵	
Regulatory <ul style="list-style-type: none">• Establish statutory basis for preparing, updating and review of National Food Waste Prevention Strategy (Roadmap) – Circular Economy and Miscellaneous Provisions Act 2022.• Engage in process following Commission proposal on EU Food Waste Reduction Target.• Engage in process regarding Commission proposal on revised rules on Date Marking under the Food Information for Consumers Regulation.	Food Waste Charter <ul style="list-style-type: none">• Launch revised Food Waste Charter.• Extend the Food Waste Charter to food supply chain businesses to establish industry agreement on food waste prevention.• Build knowledge and develop capacity for food waste measurement and prevention in food sector businesses.• Establish Food Waste Charter Action Group with sub sectoral working groups to collectively address food waste measurement and reduction in the food supply chain.• Review the effectiveness of the voluntary approach to food waste measurement and reporting to determine if there is a need to set mandatory requirements for measurement and reporting.• Identify and conduct studies to build evidence base for food waste prevention actions in food sector businesses.
Food Waste Measurement and Reporting <ul style="list-style-type: none">• Fulfil annual reporting obligations on food waste data reporting to EU.• Publish the national food waste statistics and reporting methodology for food waste data collection, validation and reporting for the purpose of reporting on Ireland's official statistics on food waste and progress made in reducing food waste.• Recommend food waste baseline dataset that links to 2030 food waste reduction target.• Promote the use and integration of the EPA's standard national food waste measurement protocol for use in key sectors via:<ul style="list-style-type: none">» Engagement with DAFM, relevant bodies and working groups (e.g., related to Food Vision 2030 implementation)» Engagement with Origin Green Programme» Engagement with Bioeconomy Policy Implementation Group» Engagement with reactivated Retail Sector Action Group» Engagement with Sectoral Representative Bodies	Food Donation – Redistribution <ul style="list-style-type: none">• Investigate the potential impact of a prohibition on the destruction of edible food in advance of its 'use by' date.• Investigate the regulatory and legal barriers to 'Good Samaritan' acts of donation and whether mandatory donation of edible food from retail outlets would reduce food waste.• Using the EPA's Food Waste Charter, support a voluntary target with retailers and the processing industry for a percentage of edible food to be donated.• Examine options that supports a significant increase in the capacity and scale of the surplus food redistribution sector (e.g. in the charity sector).• Support surplus food redistribution initiatives including redistribution of surplus food arising from sectors such as retail and primary production. Identify and support surplus food redistribution activities that can further combat food poverty.

³³ Source: <https://www.gov.ie/en/publication/824c3-national-food-waste-prevention-roadmap-2023-2025/>

Key Priority Actions for the first Roadmap 2023-2025

- Support social enterprises and community-based initiatives that promotes surplus food redistribution.
- Raise awareness on food redistribution and donation including the use of consumer and local business facing technology platforms that facilitate food redistribution and donation. Presentation to the Retail Forum.
- Work with key sectors (e.g., primary production and retail sectors) to examine how food waste due to product specification related aspects (e.g., misshapen fruit and vegetables) can be avoided.

Food Waste Segregation

- Introduce incentivised pricing for Commercial waste to support an increase in the segregation of waste.
- Make the provision of an organic waste bin mandatory as part of a waste collection service for all households.
- Roll out the provision of kitchen food waste caddies (via MyWaste.ie campaigns) to householders that have an existing organic bin collection service.

Communications, Education and Awareness

- Prepare overarching communications and awareness plan on food waste prevention related to delivery of the Roadmap.
- Roll out Stop Food Waste Communications and Awareness activities including National Stop Food Waste Day on 1st March.
- Roll out Food Waste Recycling Awareness activities including an annual National Food Waste Recycling Week.
- Identify education and training supports for organisations (e.g., food processors, hospitality and food services) that can incorporate robust food waste measurement and prevention activities.

Research and Innovation

- Provide funding for research, piloting and demonstration on food waste topics (e.g., via EPA and DAFM Research Programmes, Green Enterprise funding, Circular Economy Innovation Grant Scheme, Rural Innovation and Development Fund).
- Prepare a compendium of existing and completed research, innovation, piloting and demonstration, on food waste prevention.
- Establish a Register of Priority Research and Innovation Topics on Food Loss and Food Waste.

Green Public Procurement

- Update Green Public Procurement Policy that includes examining how food waste prevention can be further strengthened in the government and public sector.

Monitoring, Evaluation, Review and Knowledge Sharing

- Establish Food Waste Prevention Task Force and sub-sectoral groups.
- Coordinate Forum on Food Waste.
- Participate in the work of the EU Platform on Food Losses and Food Waste and associated subgroups.
- Provide annual updates on food waste (via the EPA's national waste statistics reporting) to chart the progress of the impact of Ireland's National Food Waste Prevention Programme and progress towards meeting Ireland's food waste reduction targets.
- By end of the first Roadmap period set interim targets for food waste reduction for inclusion in the next Roadmap.
- Undertake annual review of Food Waste Prevention Roadmap.

4.2 EU Platform on Food Loss and Food Waste

In December 2020, 47 recommendations³⁴ were published by the EU Platform on Food Loss and Food Waste, following a 2-year consultation process with member states and stakeholders. The following is a summary.

Cross-cutting recommendations

1. Develop national strategies for preventing and reducing food loss and waste, in line with SDG target 12.3
2. Integrate food loss and waste reduction as part of food policy strategies and programmes
3. Integrate food loss and waste reduction as part of climate action strategies and programmes
4. Scale up food loss and waste prevention action in the food supply chain
5. Address and fill the data gaps: improve availability and quality of data on food loss and waste levels and their related impacts (social, economic, environmental)
6. Improve action design, monitoring, evaluation and knowledge sharing regarding food waste prevention interventions
7. Integrate food loss and waste in education and professional training, both in public and private sectors
8. Raise awareness of food waste prevention for all of us in our role as consumers, promoting value of food and working to shift social norms so that wasting food is no longer socially acceptable
9. Provide information on involvement in food waste prevention actions
10. Improve use of date marking
11. Strengthen capacity for innovation, promoting circularity and new market opportunities
12. Incentivise food waste prevention
13. Ensure financial (and other) support to help players take action in their operations (focus on SMEs, farmers)

Recommendations for Primary Production

14. Carry out further research on marketing standards
15. Strengthen the position of food producers in the food supply chain
16. Better align supply with demand
17. Improve resource efficiency and reduce food losses in agriculture by improving animal health and welfare and access to innovation
18. Strengthen financial support to farms to drive modernisation with a focus on tackling food losses and food waste
19. Include farmers and their cooperatives and farming service providers in research and innovation activities from the beginning of the process

Recommendations for Manufacturing Stage

20. Encourage integration of food waste prevention throughout the business/supply chain (from raw material buying to marketing, logistics etc.)
21. Better planning/forecasting for raw material buying
22. Monitor, measure and report on food loss and waste quantities in order to identify and take action on hotspots
23. Take full account of critical role of packaging in ensuring food quality, safety and preventing food waste
24. Offer consumers right portion sizes
25. Improve date marking practices and consumer understanding of date marking and other relevant food information jointly with other stakeholders
26. Where food surpluses cannot be avoided, prioritise food redistribution to humans before facilitating safe food to feed transition
27. Increase sales of co-products and create more innovative products that utilise such co-products
28. Increasing the diversity of market opportunities through processing
29. Provide on-label or on-line information to consumers about better food management

³⁴ Source: https://food.ec.europa.eu/system/files/2021-05/fs_eu-actions_action_platform_key-rcmnd_en.pdf

Recommendations for Retail Stage

30. Establish trustful relationships with suppliers and share data and forecasting information to match supply and demand
31. Make food waste prevention/reduction a company priority
32. Date marking: agree on accurate date marking to provide long shelf-life without compromising safety or quality and consider the role of innovation (e.g. bar codes)
33. Greater use of food repurposing in store (e.g. processing unsold fruit/vegetables)
34. Use consumer research to better understand causes of food waste at home and tailor products, discounts and promotions to help consumers prevent food waste at home
35. Monitor, measure and report on food waste quantities in order to identify and take action
36. Put in place a favourable framework to encourage food waste reduction

Recommendations for Hospitality / food services

37. Provide support to small businesses to increase their knowledge and capacity-building
38. Motivate and engage businesses to adopt measures against food waste in their operations
39. Identify solutions to the logistical challenge linked to the collection of small quantities of food in multiple locations
40. Monitor actions' efficiency and effectiveness by setting SMART objectives and KPIs
41. Help to influence consumer expectations/behaviour to reduce and prevent plate waste

Recommendations for Consumer level

42. Individual and community behaviour change
43. Develop and use a wider range of methods to better understand consumer behaviour as regards food waste and design effective solutions
44. Increase use and development of audience segmentation

Recommendations for Food donation

45. Promote the uptake of the EU guidelines on food donation and, where needed, adopt national guidelines and/or legislation to further facilitate food donation
46. Promote the use of surplus food for food donation both in quantity and quality
47. Innovate and modernise food donation

4.3 EU Citizen panel on food waste

A Citizen Panel on Food Waste was organised by the European Commission (EC) in late 2022 and early 2023. The following is a description of the Panel and a summary of the recommendations provided by it in February 2023.

Description of citizen panel

For the first time, the [European] Commission organised [Citizens' panels](#) in order to exchange views with citizens and harness their insights on how to step up action to reduce food waste in the EU. The first Citizens' panel met between December 2022 and February 2023 to discuss food waste. The outcome of this panel are citizens' recommendations to support the Commission's work on food waste, including the legislative proposal to set EU food waste reduction targets. These recommendations also serve as a guide to help Member States in achieving the future targets.



Photo: Sante Food Waste Team 10-12 February 2023

Topic blocks

1. Cooperation in the food value chain: from farm to fork (1 - 7)
2. Food business initiatives (8 - 15)
3. Supporting consumer behavioural change (16 - 23)

Table 5: Overview recommendations.*

Title	In favour	Against	Abstain	Total
1 The closer the farmer, the happier the consumer: Less waste, more sustainability	120	15	5	140
2 Tastes of home: Public and private support for local farming to reduce food waste	119	9	12	140
3 Share don't waste!	93	31	16	140
4 Sharing of data and best practices across Europe	97	27	16	140
5 Gathering data across the food supply chain	101	28	11	140
6 Citizens' voices matter: Citizen participation in European food policy	91	37	12	140
7 Just picked: The value of seasonal food	103	26	11	140
8 EU-wide food exchange network	84	41	14	139
9 Planned purchases and redistribution	85	38	16	139
10 Restaurants stand for "enjoy without wasting"	113	17	9	139
11 All waste has a weight	73	48	18	139
12 A mandatory reporting system for transparency coupled with penalties and rewards	68	56	15	139
13 EU-wide legislation on the destruction of unsold food products – a peer learning approach across Member States	109	20	10	139
14 Transparency on food waste for visibility and action	102	22	15	139
15 Innovation in packaging and use of packaging when needed	116	18	5	139
16 Broadening the definition of food waste in order to save unharvested food	110	19	10	139
17 Encouraging adults to take action on food waste as a priority	113	20	6	139
18 Nutritional awareness and sustainable food in primary and secondary schools	123	9	7	139
19 Promote and support food sharing applications and platforms connecting consumers with each other	97	25	17	139
20 Save food, save money: A European campaign against food waste in cooperation with food retailers on four weekends a year	98	31	10	139
21 "Stop food waste": A week of food waste awareness at school	116	16	7	139
22 To provide consumers keys to be aware and independent on their impact on food waste and to understand how to process, preserve and reuse a product before and after the date of the product has passed	108	26	5	139
23 The implementation of standardized practices at the retail level when promotion to consumers products close to the expiration date.	109	18	12	139

*This table is an adaptation of table 1, page 2 of the original publication

Table 6: 10 measures with high panel scores.

NO.	Title
18	Nutritional awareness and sustainable food in primary and secondary schools
1	The closer the farmer, the happier the consumer: Less waste, more sustainability
2	Tastes of home: Public and private support for local farming to reduce food waste
15	Innovation in packaging and use of packaging when needed
21	"Stop food waste": A week of food waste awareness at school
10	Restaurants stand for "enjoy without wasting"
17	Encouraging adults to take action on food waste as a priority
16	Broadening the definition of food waste in order to save unharvested food
13	EU-wide legislation on the destruction of unsold food products - a peer learning approach across Member States
23	The implementation of standardized practices at the retail level when promotion to consumers products close to the expiration date.

Explanation per measure:

18: Nutritional awareness and sustainable food in primary and secondary schools

We recommend the inclusion of the topics of sustainable food and nutrition in primary and secondary schools' curricula, either through the creation of a new mandatory standalone course, as they already exist in some countries, and/or its inclusion in existing mandatory subjects. This recommendation aims to increase pupils' awareness of food waste through discussions on socioeconomic values, sustainable production and consumption, shopping behaviours, household economics, and practical experiences bringing schools and farms closer together. To make this recommendation happen, there are two pre-conditions for which we expect the EU to act. First, we need a multi-stakeholders awareness raising campaign to create and increase momentum around the topic (recommendation 20). Second, we need to support teachers through trainings, and pedagogical exchanges and materials, capitalising on existing networks and proven best practices. Acknowledging that these changes can take time to be implemented, it is important to organise already action days or weeks on the topic of food waste in schools, with the mobilisation of different societal actors (recommendation 21).

1: The closer the farmer, the happier the consumer: Less waste, more sustainability

We recommend that the EU continues their work with policies and initiatives to support small-scale producers in the trade with retailers and supermarkets. Large retailers/processors have a clear power advantage in this relationship, and often steer the trade in their favour, sometimes resulting in food waste. Three aspects need specific attention:

- The EU, and its member states, should encourage retailers and supermarkets to always use the closest producer possible. Furthermore, they should investigate and develop incentives that motivate the retailers to follow these recommendations.
- The EU needs to monitor and track the ban on last minute cancellations from 2019 and be ready to intervene if it is not followed.
- The EU needs to continue working with policies on ugly/wrong shaped food and investigate further what are the consequences of these rejections regarding waste.

2: Tastes of home: Public and private support for local farming to reduce food waste

We recommend local & regional authorities to support local farmers with practical solutions and initiatives aiming to reduce food waste. The goal is to encourage stakeholders to cooperate more closely to drive these initiatives and thereby create a sustainable food system that benefits both farmers and consumers. Several initiatives are suggested for local authorities to initiate:

- Tax reliefs and subsidies for small scale farmers.
- Support to find new markets where local farmers are protected from unfair power relations with retailers, as example by allocating public spaces for sales.
- Encourage inclusive processes and initiatives with value chain stakeholders for the work with food waste, as example by promoting the use of "food waste apps" in a city.
- Support associations and other actors that are supporting local farmers in food waste issues, such as food banks.

15: Innovation in packaging and use of packaging when needed

We recommend investing further in scientific research on innovative and alternative sustainable ways of packaging. This helps to increase the life span, improve the package size to reduce food waste, and ensure better food safety for its transportation. The EU should support this financially and politically through appropriate programs, such as the funding of start-ups and smaller innovating forces. Furthermore, we recommend supporting retailers to sell food without packaging, where it is possible, without compromising food security.

21: "Stop food waste": A week of food waste awareness at school

We recommend organizing a "thematic week" in schools on food waste to raise awareness on the topic among young children and teenagers. The week would adopt a form and content depending on the age of the pupils. In primary school and for younger children, the week should focus on raising awareness through games. The European Commission would create and distribute a toolkit for schools and teachers in all the EU languages on how to raise awareness on food waste at schools and how to discuss and organize activities on this topic in relation with their own teaching subjects. The toolkit would include guidelines with proposed activities to not overburden teachers and should be easily accessible online. Younger pupils would be rewarded by receiving a certificate (with EU Logo). National states would implement the week depending on the functioning of their respective education system and of their academic calendar. Schools would be free to decide what activities they want to organize during the week, with the help of the toolkit made available for teachers.

10: Restaurants stand for "enjoy without wasting"

We recommend to the European institutions the following plan to limit food waste in restaurants. Once certain quality criteria (like the ones outlined below and some others) are met, all types of restaurants should be allowed to show a logo (which is harmonised across the EU). The logo would advertise the possibility to take leftovers home and waiters should provide packages for food to take leftovers home. Those restaurants that implement the logo plan would write on their menus an additional text stating "you can take your leftovers home". If there are still leftovers of prepared food, they should be offered to employees. If there are leftovers of raw food from the kitchen, they should be offered to Food Banks/other charity institutions. If food is inedible, it should be used to produce renewable energy. To encourage restaurants to meet these quality criteria (or further quality criteria), financial support should be given to restaurants to carry out this plan. A tax relief could serve as a financial incentive and additional aid could be granted. As leftovers from kitchens can be weighed or measured, they could be monitored and taken into consideration for the tax relief

17: Encouraging adults to take action on food waste as a priority

We recommend that every member state should implement a program for adults to raise awareness and knowledge about the cost of food waste and the benefits of preventing it at national, regional, and local level. This should be based on best available data (recommendation 5) to underline the urgency of the problem. It should include apps (recommendation 18), campaigns (recommendation 4 and 20), further education and training for people working in the food industry, in-house training programmes for professionals as well as documentaries and television programs on the topic. Some possibilities could be short ads showing the benefit of reusing food, promote Sunday as leftover day, create game shows with cooking competitions for young adults to involve the broadcasters. Informing people about the economic and environmental benefits of not wasting food is important in simple messaging or nudges. A key contributor to the dissemination of information could be the media, especially the public service radio stations and television, print media, social media, public institutions, museums and retailers. 8 Existing EU institutions could develop resources to support member states (for example, the House of European History).

16: Broadening the definition of food waste in order to save unharvested food

We recommend that unharvested food should be integrated in the European definition of food waste. We also want farmers to have the possibility to commercialize less than perfect but still edible products. To avoid food loss farmers should get signs which proclaim that unharvested food may be harvested by private households and NGO's. This idea must be communicated to two groups:

- to the citizens via the campaign that is developed in recommendation 20.
- and to the farmers via the member states ministries for agriculture. The latter should implement this recommendation in coordination with local municipalities and producer unions

13: EU-wide legislation on the destruction of unsold food products - a peer learning approach across Member States

It must be ensured that food products are used in different phases before being thrown away. The priority is on avoiding food waste, but, if not possible, the following cycle applies: Human consumption, animal consumption, biofuel, and composting. The member states are responsible for the required infrastructure to be in place to enable implementation. The EU sets an overarching goal to reduce food waste by a certain percentage. Member states set national standards so that the EU goal is collectively achieved. Member states can implement either voluntary or mandatory measures for companies to comply with. The reduction needs to be quantifiable. After a pilot phase that focuses on supermarkets, and adjustments based on peer learning, the best practice should be a guideline for all member states.

23: The implementation of standardized practices at the retail level when promotion to consumers products close to the expiration date

We recommend that the purchase of products close to their expiration date be revalued by asking businesses to adopt a strategy for managing and valuing these products for the consumers. Indeed, it is a question of improving the perception by households of these products so that they are not intended for only one part of the population. This strategy is divided into several parts: - a regulatory implementation part at the European level by creating a section dedicated to these products. Easily accessible and identifiable upon entering the store to promote better consumption practices by all users, regardless of income; - The development of a communication policy highlighting "common sense" and the attractiveness of the products, as well as the responsible purchasing approach. Promotional overconsumption aspects should not be on the front communication line. - Encourage retailers to adapt their policy of putting new products close to their expiration date on the shelves at peak times (adapted to the practices of consumers in different European countries).

Table 7: Top 10 measures with low panel scores.

No.	Title
12	A mandatory reporting system for transparency coupled with penalties and rewards
11	All waste has a weight
8	EU-wide food exchange network
9	Planned purchases and redistribution
6	Citizens' voices matter: Citizen participation in European food policy
20	Save food, save money: A European campaign against food waste in cooperation with food retailers on four weekends a year
3	Share don't waste!
5	Gathering data across the food supply chain
4	Sharing of data and best practices across Europe
22	To provide consumers keys to be aware and independent on their impact on food waste and to understand how to process, preserve and reuse a product before and after the date of the product has passed

Explanation per measure:

12: A mandatory reporting system for transparency coupled with penalties and rewards

We recommend establishing a reporting system (especially like ISO certification) to set specific standards across the whole value chain including producers, manufacturers, retailers, supermarkets, restaurants, and hotels. It should distinguish between large and small/medium size enterprises (SMEs) based on existing categories to classify company sizes. There should be penalties if standards are violated and rewards if companies overperform. There should be a relative fine system proportional to the gravity of the offense and the size of the company. Rewards should primarily be based on a label system, for example, ABC grades, or potentially financial incentives especially for SMEs. Independent and external auditors must be tasked with reporting, not the companies. Public authorities at the member-state level (e.g., ministries or regulatory bodies) are in charge to ensure implementation and monitoring. The data should be publicly accessible and enable peer learning. The Commission should have an oversight and coordination function.

11: All waste has a weight

We recommend that organisations in charge of waste management are obliged to weigh, scale or measure organic waste. In the short term, the plan should focus on public institutions (e.g., schools and hospitals), entire neighbourhoods or districts and in the long-term, it should also include private households. Representatives of these institutions/districts and, at a later stage private households should regularly receive reports and comparisons to previous periods and comparisons to other entities. This leads to more awareness and is an incentive to reduce food waste. It does not have to be measured in the same way in all countries, it is sufficient if it is comparable in a respective country.

9: Planned purchases and redistribution

We recommend developing a legal framework to harmonise member states' legislation on practices for the entire supply chain regarding the redistribution of surplus and about to expire food, considering safety regulations and forecast data. Purchases should be adjusted to what will be sold. Supermarkets and suppliers could be incentivised with benefits (for example, through tax breaks) from selling at a lower price or donating.

6: Citizens' voices matter

Citizen participation in European food policy Building on the Conference on the Future of Europe and the current EU Citizen Panel on food waste, we recommend the establishment of local and national citizen engagement fora. These fora would be tasked with following, monitoring and offering advice on national strategies to implement EU directives on reducing food waste from the perspective of citizens. We further recommend that the EU Platform on Food Waste should include citizens' representation and engagement that coordinates exchanges between the engagement fora. At both a national and EU level, the fora should offer a platform for information sharing and mutual learning between citizens and consumers, stakeholders, and policy makers.

20: Save food, save money: A European campaign against food waste in cooperation with food retailers on four weekends a year

We recommend that the EU coordinates a campaign focusing on shops selling food (food retailers, supermarkets, hypermarkets, smaller shops) to be deployed in the Member States. This campaign would focus on 4 weekends each year. It would focus on the topic "save food, save money". It would be up to the different Member States to decide which weekends to pick. The choice of date should be based on the objective to raise awareness on food buying habits (for example around national or cultural celebrations) and seasonality (for example around the crop time). The campaign would be an initiative from the European Union, which would develop a uniform visual design (same logo, colour code, etc.) for all member states. The campaign would then be implemented at the national level and adapted based on the specificities of each country, their annual calendar, food habits, etc.

3: Share don't waste!

We recommend that food banks and redistributors in general should be financially supported at a basic level by governments through a structural scheme, common across Europe, instead of primarily working by private donations (but not 100% funded, so it does not turn into a business). We also recommend a platform that connects the various apps that already exist, that connect retailers to food banks; that platform should be user-friendly and efficient. The platform should be managed centrally. We also recommend that the food

redistributed (donated or sold at a lower price) from retailers to food banks is given away in good time and good condition, preferably 3-5 days before it goes bad (rather than the current 48-hour guideline). The incentive to do this could be a tax deduction for retailers, that decreases the sooner you get to the expiration date. They must donate a minimum amount of food to be eligible for this deduction.

5: Gathering data across the food supply chain

We recommend that data on how, where, who, why and when food waste occurs across the food supply chain gets collected by an EU body or other agencies or research institutions. This could be through:

- Individual consumer behaviour through app measurement.
- Face-to-face collection of data, through the Eurobarometer survey.
- Surveys sent to schools and other educational organizations. Could be before/after a school intervention targeting food waste.
- Use citizen panel citizens as a representative cohort for research purposes.
- Journalling study of consumer behaviour could be an intervention study. Inspiration from consumer scan panels of BE/NE.
- Using scientifically validated measures from universities.
- Observational studies - specifically studying actual waste amounts by drawing on existing waste management processes of towns and municipalities.
- Collecting and comparing invoices from supermarket/farmer interactions.
- Standardizing forms for reporting waste.

4: Sharing of data and best practices across Europe

We recommend that governments in each country share their data and best practices on actions to target all steps of the food waste chain, from producers to consumers, to the European Commission's platform for food waste. This information will then be managed and analysed by a special committee of EU researchers that work to spread out the good practices and make them easily accessible. The data on good practices should be categorized by types of production and types of consumption. In addition to that, we want to promote a network of cities/regions which access the data and utilize the practices that work best for them, based on similar consumption and production patterns. The network is set up for these localities to learn from each other based on these similarities. The concept of "twin cities" could be applied for this purpose: Cities with similar food waste issues work together to solve them.

22: To provide consumers keys to be aware and independent on their impact on food waste and to understand how to process, preserve and reuse a product before and after the date of the product has passed

We recommend the deployment of information tools to enlighten and (re)equip consumers in their ability to judge whether the product is truly expired. To make consumers aware of the use of their food products, we are in favour of better identification of the labelling of the date: same place for each product and larger font size. Furthermore, we want to affix a QR code directly on the product label (the possibility of also using the barcode). What is the purpose of this? To transmit information on the best ways to preserve it, to recognize (by the taste and the smell) if it is still consumable, and to transmit culinary tips to transform the product (example of adapted recipes). The producers are for us the best placed to formalize the information available via the QR code. Concerning unlabelled products such as fruits and vegetables, the QR code should be put where the products are sold to avoid unnecessary packaging. For this source of information to be accessible to everyone, we are not betting essentially on digital technology. We also wish that paper communication tools (guide available in supermarkets for example) be made available.

4.4. International institutions and organisations

4.4.1 EEAC - European Environment and Sustainable Development Advisory Council

Towards a sustainable food system (2022)³⁵

Food system innovations focus on the challenges that lie ahead. Food prices should reflect the true costs of production, including damage to the climate and biodiversity caused by emissions and overly intensive land use. Overarching principles are needed as a way of guiding better coordination between agricultural policy, environmental policy and consumer policy. Those various policies need to be able to deliver a resilient European food system guaranteed to provide a sustainable food supply that has low environmental and ethical impacts, and that helps to assure food and nutrient security and healthy lives for current and future generations. In so doing, we need to ensure that:

- ➔ Healthy, sustainable foods are available to all European consumers at prices that reflect true costs, in line with the polluter-pays principle
- ➔ Food is produced in appropriate quantities using processes that perform to the highest reasonable level of environmental and ethical standards, and regenerate climate-resilient and healthy agro-systems
- ➔ The food system works as inclusively as possible and relationships between actors in the food chain are balanced, providing fair incomes for people to live on and fair working conditions for farmers and other workers
- ➔ New technologies are developed, and that we encourage the use of the best available technologies in relation to climate change and ecosystem services, while adhering to the precautionary principle

Policy implementation takes into account a wide range of issues including relationships with third countries, other sectors using biomass, the circular economy, the potential of digitalisation, the role of the food environment in consumer behaviour and the substantial differences in natural conditions and environmental issues between European regions.

- Advocating for the certification of all companies as a way of determining the sustainability of individual companies and their production methods.
- Using digital solutions to reduce administrative burdens
- Classifying companies from dark green to red, and using this as the basis for assigning eco-labels to companies and products. This could be used as a way of informing consumers, and for government procurement policies and allocation of payments under the CAP.
- Requiring sustainable procurement. Purchase of a minimum percentage of sustainable products at an additional cost. Companies can then decide to channel those products through a quality label or merge them into their standard offering. This will make the market more sustainable and ensure that consumers start to pay for the true costs of production.

4.4.2 Champions 12.3

Champions 12.3 Progress Report 2022³⁶ (in English)

As of the end of 2021, **just a handful of countries measured their food loss and/or waste throughout the entire human food supply chain**, including Argentina, Australia, Canada, Colombia, Denmark, Israel, Italy, Japan, Finland, Mexico, **the Netherlands**, New Zealand, Norway, Saudi Arabia, Slovenia, Spain, Sweden, the United Kingdom, and the United States.¹ This group constitutes about 12 percent of the global population, which is well short of the 2019-21 milestone of “Countries with 40 percent of the global population have quantified base-year FLW and have started reporting on FLW.” For this milestone, we give a red assessment. However, there is reason to believe that measurement at the country level will improve over time, as new tools become available to countries.

The Food Loss Index, developed by the FAO, estimates food losses occurring within a country from farm gate up to (but not including) food retail (FAO 2018). The complementary Food Waste Index, developed by UNEP,

³⁵ Source: Towards-a-sustainable-food-system--An-EEAC-Network-Position-Paper-PV.pdf

³⁶ Source: <https://champions123.org/publication/sdg-target-123-food-loss-and-waste-2022-progress-report>

estimates food waste occurring from the retail stage of the food supply chain through the household consumption stage (UNEP 2021). Additionally, in 2019, the European Commission adopted a common methodology for EU countries to measure food loss and waste. The first monitoring exercise carried out for 2020 will be published in autumn 2022. (European Commission n.d.).

Also, the ISO has assembled a working group for the purposes of "standardization of food loss and waste, providing a framework for food organizations throughout the food chain, to work actively and effectively with measuring and reduction of food loss and waste" (ISO 2021).

In light of these developments, it is possible that additional countries will begin reporting in the near future.

Champions 12.3 – 123 Pledge³⁷

The #123 Pledge is hosted by WRI, UNEP and FAO and will be launched at COP27 (2022) but will continue towards COP28 (2023).

The '123 Pledge' is a call to action for governments, companies, institutions and single entrepreneurs (like chefs) to prioritize fighting food loss and waste within their climate action agenda.

Organizations taking the '123 Pledge' must meet a number of requirements designed to ensure impact, progress and transparency toward a worldwide goal of halving food loss and waste by 2030, in line with the UN Sustainable Development Goal 12.3. Commitments must include a climate angle and be timebound and measurable. Commitments must also tie to at least one of five priority areas:

1. Integrating food loss and waste reduction into country and company climate strategies;
2. Reducing food loss and waste along supply chains;
3. Stimulating action at the national and subnational (city) level;
4. Measuring, reporting and creating policy and regulatory frameworks for food loss and waste reduction; and
5. Supporting behaviour change at the consumer level through awareness, education, and enabling conditions.

4.4.3 WRI

Reducing food loss and waste: ten interventions to scale impact³⁸ (in English)

This publication is intended to inspire midlevel managers within governments, companies, nongovernmental organizations, and research institutions to start to pursue one or more of these interventions— typically in some form of collaboration between sectors. Although it is not an "implementation manual," it lays out the basic foundations for these 10 interventions:

1. Develop national strategies for reducing food loss and waste.
2. Create national public-private partnerships to tackle food loss and waste.
3. Launch a "10 × 20 × 30" initiative to get supply chains working on reducing food loss and waste.
4. Invigorate efforts to strengthen value chains to reduce smallholder losses.
5. Launch a "decade of storage solutions."
6. Shift social norms to make wasting food socially unacceptable.
7. Go after the hotspots of food loss and waste-related greenhouse gas emissions.
8. Scale up financing for food loss and waste reduction technologies, enterprises, and programs.
9. Overcome the food loss and waste data deficit.
10. Advance the research agenda on food loss and waste.

³⁷ Source: <https://champions123.org/123pledge>

³⁸ Source: <https://www.wri.org/reducing-food-loss-and-waste-ten-interventions-scale-impact>

4.4.4. STOA - Science and Technology Options Assessment 2013

Technology options for feeding 10 billion people – options for cutting food waste (2013)³⁹

Published 10 years ago as an input into the development of the EU Platform on FFW and various national strategies, based on a technology perspective. The summary recommends 14 points:

- 1. Set a mandatory target**, which regional and local authorities can translate into their own achievable targets. By their nature, mandatory targets are better for tracking progress and for determining the effectiveness of different measures. There's also a recommendation to establish voluntary commitments with a variety of individual sectors to reduce waste.
- 2. Improve the availability and reliability of data on waste.**
Establishing definitions and interpretations, and using harmonised methodologies, can help improve data quality. It's recommended that this be done at the sectoral level, at the very least.
- 3. Review national/EU legislation on food safety.**
Efforts to reduce waste and to prevent health risks to humans and animals can lead to some conflicts. Certain standards (e.g. in relation to contamination, MRLs and hygiene legislation regarding packaging and storage) might be identified as being unnecessary to safeguard human health, and if they lead to unnecessary waste, they could be reconsidered. This does require additional research to ensure that it is safe to exceed established limits.
- 4. Amending European marketing standards.**
It's recommended that the whole system of legal marketing standards be revamped, replacing it with a new system based not on visual features but purely on quality, taste, nutritional value and production methods. This new system should be designed in consultation with relevant actors, civil society organisations and scientific experts.
- 5. Opening up alternative market channels for primary sector products.**
Specifically for those products that do not meet marketing standards, and focusing on direct marketing systems, such as farmers' markets, cooperatives, social initiatives and 'community supported agriculture'. This would be aimed at short supply chains and be based around natural and seasonal variation. Some supplementary research would be needed to flesh out this approach, and to understand any potential negative rebound effects.
- 6. Streamlining shelf-life information on packaging.**
Resolve consumer confusion around the interpretation of 'use by' and 'best before' dates, with input from the EU legislator to clarify guidelines. 'Best before' dates should also indicate the 'real' shelf life, without unnecessary margins. For products with a stable shelf life, the removal of the date requirement should be considered. National governments and supermarkets are advised to set up consumer campaigns. The retail sector could work with the food processing industry to consider omitting other shelf-life-related information (e.g. 'display until') altogether, and to instead mark down (dynamically) the prices of products that are approaching their expiry date.
- 7. Improving workflows and supply chain management.**
Encourage the use of state-of-the-art equipment in the food processing industry to save raw materials, monitor waste streams, and rework them into the system. Processes could be improved by, for example, reducing cleaning requirements, and not mixing ingredients any earlier than necessary. Producers and retailers need to have robust agreements in place so that they can match demand and supply as efficiently as possible. Governments can support this by setting up special advisory programmes. The aim here is integrated supply chain management.
- 8. Awareness-raising campaigns.**
Information and knowledge are crucial to behavioural change. Consumer campaigns need to be initiated aimed at improving the way people use food (buying, shelf life, storing, cooking, using leftovers), and targeting specific audiences. This could be done in partnership with retail and the hospitality industry, through various channels. Educational programmes for schoolchildren should also address the importance of food skills.
- 9. Fighting waste in the hospitality sector.**
This includes flexibility in portion sizes on menus, from 'all-you-can-eat' to 'pay-by-weight'. The hospitality industry should be given the opportunity to test out various options. Should they fail to

³⁹ Source: [https://www.europarl.europa.eu/RegData/etudes/STUD/2013/513515/IPOL-JOIN_ET\(2013\)513515_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2013/513515/IPOL-JOIN_ET(2013)513515_EN.pdf)

implement measures voluntarily, the government can start mandating demonstrably effective options. As well as addressing portion sizes, this could include purchasing practices, storage/cooling, staff training, menu planning and waste monitoring.

10. Economic incentives.

There's a broad consensus that the undervaluing of food stems from lower market prices. In this context, many experts consider economic tools to have the potential to boost consumer perception of the value of food. EU member states should review their VAT laws to remove any incentives with the potential to cause food waste. One option to consider is the lowering of VAT on food, or the introduction of different rates related to the environmental impact of the product. Any social inequalities triggered by this tax harmonisation should be compensated for with income support financed by the additional tax revenues. A possible alternative to taxing food consumption would be taxing food waste.

11. Taxes and surcharges on waste management.

Taxes and surcharges on waste management, such as those applied to landfill or incineration, can be regarded as economic incentives to avoid waste because they contribute to the total cost of waste treatment. If waste management taxes are to be used as a way of preventing food waste, a number of conditions will need to be met. First, households and commercial businesses (especially retail and the out-of-home sector) need to be required to separate their food waste. Second, existing regulations that promote and subsidise the use of renewable energy in Europe should be reassessed to identify any conflicting incentives with regard to preventing food waste. It's particularly counterproductive for national legislators to impose high taxes to process food waste if they're also providing subsidies for generating energy from waste.

12. Promote donation and redistribution.

Even when every opportunity to prevent food waste has been exploited, there will always be a certain amount of surplus food. Food redistribution programmes are a proven instrument for using those surpluses efficiently and in a way that benefits economically marginalised groups. It's important to check whether European legislation in this area should be amended to bring it in line with the US Good Samaritan Act to reduce the legal liability of donor organisations and charities redistributing surplus food. Without such an amendment, there is a strong incentive to throw away unsold products rather than donating them. It's also important to assess whether financial incentives would help to develop the European food bank system further.

13. Sharing networks for surplus food.

Giving away surplus food for free to people who need it is a reasonable approach to saving food that would otherwise be thrown away, and making it available for people to eat. This can be done privately too. The aim of consumer-help platforms is not just to provide infrastructure for food sharing, but also to educate consumers on how to properly handle food. National governments should consider providing financial support to private sharing networks and removing any bureaucratic hurdles. Research projects should be initiated to measure and improve the effectiveness of these networks.

14. Assessing technological developments with regard to waste.

A variety of technological innovations are available to help reduce food waste at every stage of the food chain. Some are already widespread, such as intelligent ordering systems for supermarkets and RFID technology to collect data during distribution. Newer technologies include smart packaging labels, and smart refrigerators and waste buckets. They promise convenience and less waste, but it's unclear whether they will really contribute to reducing food waste. As these technologies are still in their infancy, they still need more research and a careful assessment of their pros and cons. Both the EU and national governments should therefore initiate research into a variety of technological solutions, taking into account national differences. This should include field tests.

4.4.5 FUSIONS & REFRESH

FUSIONS - Analysing food waste policies across the EU-28⁴⁰ (in English)

FUSIONS (Food Use for Social Innovation by Optimising waste prevention Strategies) is an EU FP7-funded project running from 2012 to 2016, that has the ambition to contribute to achieving a resource efficient Europe by significantly reducing food waste across the supply chain through socially innovative approaches. To achieve this ambitious goal, FUSIONS focuses on the harmonisation of the definitions of food waste, on the assessment of different methodologies and information sources to collect reliable data, on the identification of opportunities to improve food use by developing and evaluating feasibility studies for creating a better understanding of the impact and appropriateness of specific social innovation options. Moreover it contributes to policy making at the EU and national level by identifying and analysing socially innovative solutions for optimised food use, including socio-economic incentives and improved legislation aimed at food safety and hygiene regulation, labelling, food redistribution, and awareness and education campaigns, based on the discussions and findings of the FUSIONS European Multi-stakeholder Platform.

Based on the findings of the FUSIONS project, six groups of recommendations concerning policies, practices and effective approaches for food waste prevention and reduction in the EU28, on both European and Member State (MS) level, are suggested. These recommendations and guidelines can support the development and implementation of a common European policy framework for food waste prevention. The recommendations are listed below.

1. On defining food waste and developing a methodology for its measurement

- Recommendation 1.1: Establish a common framework for food waste definition. A major finding within FUSIONS entails the establishment of a harmonized definitional framework to measure and monitor food waste across EU-28. The advantages are manifold and deliver a baseline for progress monitoring and identification of hot spots for prevention and reduction measures. It support facts-based policy development as well as serving as a benchmarking instrument demonstrating successful endeavours to tackle food waste on MS and EU level. Therefore, the EC should adopt a common definition of food waste to be used by Member States as a reference for food waste quantification, monitoring and reporting. We recommend using the definition and related definitional framework developed within the FUSIONS project through careful and concise analysis and consultation, resulting in a flexible, encompassing framework, that allows for different perspectives in scoping desirable and undesirable destinations to fractions of food removed from the food supply chain.
- Recommendation 1.2: Establish a standardised methodology for data collection. The FUSIONS food waste baseline estimate study (published March 2016) identified the gaps and lack of sufficient, high-quality data to measure food waste across EU28. This largely originates from a lack of standardised methodologies used across the MS. Making the collection of food waste data at national level in accordance with a common methodological framework mandatory for all MS will significantly contribute to the availability of reliable data sources. This will support the development and monitoring of food waste prevention programmes at EC and MS level. Additionally, incentives for developing national Food Waste Quantification Studies (NFWQS) should also be provided. FUSIONS recommends the adoption of the methodology developed within the project. The FUSIONS quantification manual provides practical guidelines for a standard approach for EU MS on how to quantify food waste in different stages of the food supply chain.

2. On encouraging a dialogue among Member States and food chain stakeholders

- Recommendation 2.1: Strengthen the EU Platform on Food Losses and Food Waste. The EC should continue to strengthen the EU Platform on Food Losses and Food Waste to share knowledge and best practices on food waste prevention. The existing platforms developed by other organizations should be taken into account, and the opportunity to create regional platforms to tackle issues of particular relevance in certain regions should be considered. The networking, consultation and best-practice sharing / peer-to-peer learning functions of a multi-stakeholder Platform can contribute to more successful implementation of food waste prevention strategies and increase the replication and

⁴⁰ Source: (eu-fusions.org)

upscaling of proven approaches across the EU-28. The Platform should create opportunities for meetings and dialogue using IT-facilitated communication options. In this sense the FUSIONS European Multi-stakeholder Platform has been a proven sound way to:

- attract and involve interested stakeholders from the entire food supply chain, to provide them with a forum for exchange ideas, best practices and knowledge on social innovation and food waste prevention/reduction;
- engage key stakeholders, with a sound reputation and influence in the field;
- organize targeted and focused consultations for input and consensus building on specific issues and topics;
- create a sense of commitment stimulating active involvement in knowledge sharing and consultation processes.

3. On stimulating social innovation for food waste prevention

- Recommendation 3.1: Develop guidelines for policy interventions stimulating social innovation to achieve food waste reduction/prevention. The EC should publish guidelines supporting MS to identify policy interventions aimed at stimulating social innovation for food waste reduction/prevention. FUSIONS identified a number of potential interventions, like the provision of specific socio-economic incentives to: ○ create new business models for achieving a collaboration between regular and social economy; ○ stimulate inter-sectoral and intra-sectoral private-private partnerships and dialogue, including the introduction of voluntary and negotiated agreements; ○ invest in research and innovation on success factors of social innovation; ○ promote awareness and education; ○ identify and set up indicators for policy evaluation.
- Recommendation 3.2: Develop guidelines on how to secure financing sources for social innovation initiatives. The most significant barrier identified within the FUSIONS Feasibility Studies concerns the way to achieve a sustainable financing of socially innovative projects. Project managers of new initiatives indicated that the lack of funding posed challenges to further development of their initiatives. To address this barrier, an organisation which identifies various grant possibilities social innovation projects can bid and apply for is proposed as a solution. The inconsistencies in local funding among MS also makes the replication of social innovation activities difficult.
- Recommendation 3.3: Stimulate an entrepreneurship / "learning by sharing" approach to replicate social innovative initiatives across EU-28, including the creation and expansion of a food surplus social innovation network. Creating links among like-minded individuals can facilitate the exchange of information on best practices and a learning process, especially if creative entrepreneurs are able to meet and share their work first hand with each other. Up until now, this has proved difficult to be achieved, as the visibility of social innovation projects is limited. Therefore, a network that keeps track of these initiatives, and connects all active social innovation projects addressing food surplus throughout Europe should be promoted.

4. On facilitating food donations

- Recommendation 4.1: Support creation of a favourable EU and national legislative framework to promote social innovation initiatives on (increased) food donations. The EC should foster MS to identify measures to stimulate a policy environment that enables social innovation initiatives and other activities to promote food redistribution. FUSIONS Feasibility Studies showed that the EU and national legislation on food redistribution should be further clarified and where possible and beneficial harmonised. This includes guidelines on health and food safety aspects, environmental health, trading standards, as well as taxation incentives. Policies and laws which unnecessarily hinder the re-distribution and prevention of food waste should be further analysed and best practices identified and shared, to explore whether a more favourable policy framework might be created.
- Recommendation: 4.2 Harmonizing VAT rules for donating food. It should be ensured that VAT rules for donating food to charitable organizations are implemented in a harmonized way in all MS. The EC (DG Taxud) should amend Council Directive 2006/112/EC, clearly specifying that the VAT has NOT to be paid when food is donated to food banks.
- Recommendation 4.3: Adopting an EU-wide scheme to encourage food business operators to donate their unsold edible food to charities. The EC should examine the possibility of adopting, in cooperation with the actors of the food supply chain, an EU-wide scheme to encourage food business operators to distribute their unsold edible food to charities, as required by the EU Parliament (EP)

under the resolution "Resource efficiency: moving towards a circular economy" of July 9th, 2015 (2014/2208(INI)) (point 47). Specific guidelines for the application of fiscal incentives for food donors by EU MS could be adopted within this context.

- Recommendation 4.4: Develop guidelines on food donation at EU level and support the fostering of the adaptation of national guidelines. The EC should develop, in co-operation with MS and stakeholders, guidelines to facilitate food donations in the EU. These should identify the food safety and hygiene regulations food business operators must comply with, as well as the fiscal rules applied to food donation. The donation of food beyond its "best before date" should be clearly allowed (currently, this is allowed in some MS and prohibited in others). Different legislative models to limit the liability exposure of food donors should be examined to identified best practices aimed at boosting surplus food donation. Moreover, the EC should foster the adoption of national guidelines on food donation that comply with the EU Guidelines, and ask MS to clarify any national peculiarity.
5. On a more effective role of government
- Recommendation 5.1: Improve cooperation and coordination among EU Directorates-General (DGs). Food waste is a multilevel and multisector issue, and is therefore included in different legislative and policy areas. FUSIONS advocates an integral approach in tackling food waste throughout the food supply chain, and recommends to intensify the collaboration across various EC DGs. The efforts by DG Health and Food Safety (SANTÉ) in leading the European food waste policy agenda, together with the supporting actions in the framework of the Circular Economy Package, led by the DG Environment, can achieve larger impact, effective implementation and management of a comprehensive food waste reduction strategy by increasing their alignment in ambitions and targets, creating synergies in their joint actions, collaborating in involving the other Directorates-General – including but not limited to the DGs Agriculture and Rural Development (AGRI), Maritime Affairs and Fisheries (MARE), Taxation and Customs Union (TAXUD) and Internal Market, Industry, Entrepreneurship and SMEs (MARKT) –, and clarifying the legislations by removing legislative contradictions and barriers.
 - Recommendation 5.2: Launch a pan-European awareness-raising campaign. Although it is difficult to measure the direct and short-term impact of awareness raising campaigns, they are a key step to raise awareness of the food waste issue and to voice the call for action. The EC has a leading role in launching a pan-European campaign at targeted audiences to raise awareness of the need to reduce food waste and emphasize the role each individual and group plays or could play. This role can include the formulation of targeted key messages addressing known food waste drivers, and the provision of positive examples of practical action to tackle food waste. This will provide both a sense of urgency and opportunity for action, changing behaviours at consumer level and further upstream along the supply chain. The EC is thus recommended to foster the implementation of National Campaigns across all EU-28 MS. Given the availability of relevant experiences achieved in a number of MS, the EC can provide information and share tools to be included, as well as emphasize the main points of attention to be addressed in the campaigns. Harmonised information provision will enforce a strong message resounding in similar ways across the EU-28.
 - Recommendation 5.3: Evaluate the potential impact in terms of food waste when conducting an impact assessment on new relevant legislative proposals. The EC should evaluate the potential impact on food waste when conducting an impact assessment on new relevant legislative proposals, as required by the EP resolution "Resource efficiency: moving towards a circular economy" of July 9th, 2015 (2014/2208(INI)) (point 47).
 - Recommendation 5.4: Define a common framework for the evaluation of policy interventions. The EC should adopt specific guidelines for the evaluation of policy interventions/strategies/programmes addressing food waste implemented at EU, national and local level.
 - Recommendation 5.5: Increase consumer understanding of the interpretation of date labels. The EC should promote, in collaboration with MS and private sector organisations, a better understanding of the interpretation of date labels. This should be targeted at all stakeholders, with a focus on consumers, and should provide clear information and instruction how mandatory date labels including "best before date" and "use by date" should be interpreted, in order to prevent unnecessary food waste. Also, alternative terminologies could be considered to increase consumer understanding.

- Recommendation 5.7: Foster the use of former foodstuffs and by-products for feed production. The EC should improve the existing legislative framework regulating the use of former foodstuffs and by-products from the food chain for feed production, and improve the knowledge by food business operators of currently available tools and opportunities.
 - Recommendation 5.8: Improve (by-)catch restriction rules. The EC should set clear rules that allow for the valorisation (out of market) of landed fish, carry out scientific studies aimed at identifying which species have "high survival rates", support the development and implementation of new technologies allowing species focused fishing.
6. On Stimulating further research
- Recommendations 6.1 and 6.2: Improve the knowledge on food waste drivers and on their environmental, social and economic impacts. Improving knowledge on food waste drivers and on their environmental, social and economic impacts is essential for the design and implementation of effective prevention policies at EU, national and local level. The EC should examine how to better prioritize research in this area in the framework of the existing EU funding programmes, and how to stimulate a better coordination of the research activities carried out at national level.
 - Recommendation 6.3: Address the waste of food linked to the presence of contaminants in food. The EC should promote actions and research aimed at improving the knowledge about the implications of contaminants in food for human and animal health. It must be taken into account that, for some substances, the zero-tolerance criterion could lead to unnecessary food waste generation, due to improved detection methods. The report also includes a number of additional, potentially relevant, policy options not directly based on FUSIONS work, but that emerged as non-secondary issues during the consultation sessions held within the FUSIONS European and Regional Platforms meetings. These options should not be considered as specific recommendations, but could be taken into further consideration for the identification of a common European food waste policy framework.

Other relevant policy options to be considered include:

- establishing mandatory separate collection systems (and targets);
- introducing binding targets for food waste prevention;
- adopting a legally binding food waste hierarchy;
- redressing perverse financial incentives;
- promoting short food supply chains;
- establishing a minimum standard for enforcement bodies across Europe;
- introducing food waste prevention criteria within the EU GPP criteria for food and catering services;
- introducing food waste prevention requirements within the European Ecolabel for tourist accommodation services and camp site services;
- fostering MS to adopt National Food Waste Prevention Programmes;
- promoting R&D in the field of food saving packaging.

REFRESH – Policy recommendations to improve food waste prevention and valorisation in the EU⁴¹ (in English)

Currently, one third of annual global food production is wasted per year. This amounts to 1.3 billion tonnes of wasted food, representing the emission of 4.4 Gt CO₂ per year. If food waste were a country, it would be the third-largest CO₂ emitter in the world, after China and the United States (FAO, 2011). Globally, food waste represents an enormous loss of a valuable resource with unacceptably high economic, environmental and social impacts. Reducing food waste should therefore be an urgent policy priority. This cross-sectoral problem is partly due to lock-ins in the food chain in relation to misfits between supply and demand and how these are managed between chain actors. The added value to supply chain actors of implementing food waste reduction measures is often not apparent to their own benefit, due to a lack of awareness or knowledge of the economic and environmental benefits seen from a full chain perspective. The cross-sectoral nature of food waste underscores the need to target all levels of the supply chain within an integrated approach when defining food waste reduction policies in order to ensure maximum impact and collaboration between actors. This report presents a series of policy recommendations based on research conducted within

⁴¹ Source: <https://eu-refresh.org/policy-recommendations-improve-food-waste-prevention-and-valorisation-eu.html>

REFRESH to reduce food waste along the whole supply chain, and improve the management of surplus food and food waste flows at the European level.

The broader base for this summary of policy recommendations is published as REFRESH policy briefs and research reports in three areas:

- 1) Consumer behaviour
- 2) Integrated supply chain policies (including Unfair Trading Practices and Voluntary Agreements)
- 3) Valorisation

Based on the REFRESH findings in the selected three key policy impact areas, the following main policy recommendations could be formulated.

On Consumer behaviour

Consumer behaviour is regarded as the resultant of motivation, ability and opportunity within the practice of household food management. REFRESH recommends the following when setting policy priorities:

- (Re)Set the social norm
- Use education to teach respect for food & cooking skills
- Encourage a mindset of flexibility in light of unforeseen events
- Take complexity and multiple-goals into account within communication / campaigning
- Consider interventions based on regulation, economic instruments and nudging approaches
- Use directive guidance in on-pack information to support consumer ability/skills development
- Utilize user-friendly IT tools, include incentives for using new technologies
- Take consumer acceptance into consideration, especially for novel solutions
- Monitor and evaluate interventions to gain insights about the effectiveness and allow for adjustments.

On Integrated supply chain policies (Voluntary Agreements & Unfair Trading Practices)

Voluntary Agreements (Vas) are self-determined commitments or pacts with qualitative and quantitative objectives, developed by private entities and/or other stakeholders in consultation with their signatories. They are used as alternative courses of action to traditional legislation and can be piloted by government officials, businesses or other actors. Vas can be used in addition to or independently from existing legislation. REFRESH recommends the following when setting policy priorities:

- Use voluntary and regulatory approaches to build flexible, transparent and collaborative supply chains that are better able to respond to the challenges of FW
- Understand the difference between countries' existing FW policies and the context they exist within
- Apply the Target-Measure-Act principle
- Ensure long-term financing and governance
- Establish an independent "third-party" to oversee the Voluntary Agreement
- Create an EU wide framework to support MSs establishing Voluntary Agreements

Unfair Trading Practices (UTPs) are broadly defined as practices that grossly deviate from good commercial conduct within trading relations between two parties, often as a result of an unequal balance of power in that relationship. Whereas Vas can be seen as a positive incentive towards supply chain collaboration, UTPs can be regarded as negative incentives. REFRESH recommends the following when setting policy priorities:

- Develop a clear and easy to follow code of practice to govern trading behaviour in the food supply chain
- Provide sufficient resources to implement measures to investigate and prevent infringements
- Publish proven cases and fine in relation to turnover
- Provide financial support for the Adjudicator based on industry levy rather than fines
- Protect anonymity of case filing food business operators and accept civil society's evidence
- Include international and indirect suppliers in tackling UTPs, in- and outside EU MSs, and ensure that all covered by the code are aware of their rights.

Valorisation

Valorisation focuses on the exploitation of (un)avoidable side-flows from the food supply chain that do not have a primary process function towards human consumption. This can be achieved via a feedback through

animal production or ingredient processing or other highly valued applications. The valorisation approach follows the food-use hierarchy as adopted by REFRESH. REFRESH recommends the following when setting policy priorities:

- Identify valorisation options using the REFRESH Top Waste streams and the FoodWasteExplorer tools
- Perform case-specific Life Cycle Analysis (LCA) assessments and Life Cycle Cost Analysis (LCC) based on the food use hierarchy for valorisation options, to compare environmental benefits and economic viability. The use of the FORKIFT tool developed within REFRESH can support stakeholders' decision making on investments and selection of measures.
- Ensure technical feasibility and (future) legislative compliance of new valorisation options
- Take into account that economically viable valorisation of side flows needs to consider available volume of side flows and logistics for collection and processing
- Raise awareness across the food supply chain including consumers on the environmental and economic impact of food waste, and the opportunities for reduction related to dietary changes (e.g. less meat and consumption of more seasonal produce).

Call for integrated policies for food waste and sustainable food systems in the circular economy

This report focuses on the three key policy areas (consumer behaviour, integrated supply chains, and food valorisation) to provide policy recommendations that are backed by project-based evidence. However, the food waste problem is a vast and complex issue that is transversely and (in)directly affected by numerous (other) policies areas. There is a need for more integrated policies for food waste and sustainable food systems in the circular economy. To achieve maximum impact on preventing and reducing global food waste, policy makers and other stakeholders will need to work on an integrated policy framework for sustainable food systems, that tackle food waste at its roots. Therefore, REFRESH calls for: Based on the outcomes of the Project, REFRESH calls for integrative policy action on food waste, including:

- Development of integrated policies to prevent and reduce food waste and to promote sustainable food systems
- Development of integrated supply chains
- Stimulate sharing of data (data transparency) to improve supply chain collaboration, through baseline and impact measurements on business, sector and national level.
- Set priority action on the largest impact areas, by taking the food use hierarchy as leading principle, considering trade-offs and benefits of different 8 Policy recommendations to improve food waste prevention and valorisation in the EU valorisation options from an integrated perspective, including environmental, economic and social aspects.
- Focus on:
- Those food products that have the highest impact on food waste generation and reduction, such as bread and fresh fruit and vegetables (highest volumes) as well as animal-based products (highest environmental impact).
- Capability to absorb 'gluts' in the food system, the desirability of year-round availability of fresh produce, promotion of head-to-tail usage within animal production and consumption as well as investigating the impact of dietary changes on food waste prevention.

A number of issues were identified that comprise elements of a roadmap towards an integrated food waste policy for the EU. These issue areas indicated below, structured by the 'target – measure – act' principle:

TARGET:

- Having stronger food waste reduction targets would create a stronger incentive for Member States to reduce food waste.
- Voluntary Agreements and setting binding targets for Member States holds strong potential for both food waste reduction and establishing sustainable food systems.
- Getting people to realise the true price of food is a key policy driver towards sustainable food systems ◊ incentivising for food systems production, and penalizing for wasting or dumping (based on a polluter pays scheme). Such a scheme exists for plastics in the UK, it could be replicated for food waste.

MEASURE:

- Measuring and monitoring food waste data has the potential to feed into projects that could drive food waste reduction. Identify drivers of food waste reduction, and establish a baseline to monitor the progress achieved.
- Make public reporting of food waste compulsory for the public and private sector: "When you report on waste, you act on it".

ACT:

- Design and use tools and technologies (e.g. ICT based applications) that will create innovative solutions to monitor and forecast the food demand by working with the dynamic of the food supply chain, driven by private sector actors.
- Target goal-oriented innovations, related to: business models and business practices, technology, research, holistic approaches to UN SDGs, and social innovations. These innovations should be inclusive, and should have quantifiable and measurable effects. 9 Policy recommendations to improve food waste prevention and valorisation in the EU.
- Introduce public (green) procurement with transparent criteria and/or requirements, such as what can be done in schools e.g. green requirements, limiting the size of portions, etc.
- Enhance education and awareness at all levels, including better communication (school programmes, social and traditional media) and engagement of stakeholders.
- Connect the consumer with primary production. The consumers' wants and needs must be adapted to the reality of primary production and vice versa. Food producers have a responsibility to educate the public/consumers about the reality of primary production.
- Impact carbon emissions. Carbon taxes and a functioning carbon trading system would have a strong impact as it would drive systemic change, notably by setting higher CO2 reduction goals.

Furthering the roadmap for impact, the following recommendations were noted for the new Commission:

- Action on food waste should start right away. At first, consolidation of data, including data at the local level, is needed before implementing any actions. The actions which will be decided should be focused on achieving the SDGs (12.3 but not only), and the topic of food waste should remain high on the EU's agenda. Getting Member States to see SDGs and other targets as hard commitments. For instance, national level reporting would help Member States become more active in tackling SDG 12.3.
- At the short or medium term, establishing a food waste action plan, containing a clear set of actions, part of the circular economy action plan. This plan should be aligned to the key related topics (hygiene, safety, nutrition), involving cross-sectoral teams. New priorities should be set at the EC's DG levels at the long term, including a priority focus given to an integrated food systems strategy.
- Establish an integrated food policy legislation, in synergy with a vice president who would act in favour of the food policy and which can promote and organise more inter-commission work: for instance, aligning agricultural policies with health outcomes (e.g. the production of healthy food).
- Better alignment of food policies with other policies, by working alongside other commissioners, and ensuring there is more communication amongst all, especially concerning the tools that are available to them. A number of suggestions on a more detailed level include the following:
 - Campaigns at the EU level: support from the Commission could prove useful to set up campaigns. Retailers have already been invested in communication campaigns activities, but the Commission could use its influence to support and disseminate food waste prevention campaigns.
 - Best practices that Member States should implement concerning taxes, and subsidies in the event of redistribution of surplus food. 10 Policy recommendations to improve food waste prevention and valorisation in the EU
 - Proper review of the competitiveness of the grocery and retail market across Europe: having the EC consider these topics could avoid market distortion. There is only a small number of large-scale buyers across the EU: a review of the market competition could help identify priority areas for action (UTPs, added value at the primary production stage).
 - Strengthen legislation to improve farmers' incomes, and work at the primary production level to avoid the occurrence of Unfair Trading Practices at the short term
 - Standardisation on date marking requirements.

-
- Establish mandatory public procurement in line with a food waste reduction target defined at the EU level.

4.4.6 WWF

Halving food waste and loss in the EU by 2030: the major steps needed to accelerate progress (2022)⁴² (in English)

Measurements

The collection of accurate and robust FLW measurements across the EU will be an iterative process, regardless of the measurement occurring within, or beyond the scope of the revised Waste Framework Directive and the food waste measurement Delegated Act. Indeed, there are many measurement challenges and opportunities such as:

- Introducing FLW measurement approaches and methods to those businesses who are less familiar with them;
- Improving FLW reporting methods, combining both anonymous and public reporting;
- Further ensuring measurement approaches adopted are those which are both robust and accurate.

Addressing these challenges would be truly instrumental in effectively reducing FLW across the EU and will help determine realistic and ambitious FLW targets. This could be done by:

- Effectively disseminating current best practice approaches and stimulating the introduction of new measurement technologies and methods for the provision of advice;
- Developing easy-to-use reporting systems and providing additional support and positive recognition for those businesses publicly publishing their FLW data;
- Assessing financial incentives and providing additional resources to ensure robust measurement methods are feasible.

Valorisation

The valorisation and extraction of added value from FLW can be seen as an emerging disruptive (but proven) technology that often has a faster implementation period than other FLW reduction initiatives (e.g. regulation and voluntary agreements). However, there are some challenges to the further adoption of valorisation.

These include:

- The need to communicate to the food industry the potential (and business case) for valorisation for their specific production process;
- The identification, linkage and mapping of waste streams to the places where valorisation can occur;
- The scaling of valorisation infrastructure to accommodate the increased input of feedstock.
- The existing policy disincentives that favour energy recovery over valorisation.

These challenges can be addressed through

- Further research and the effective dissemination of beneficial valorisation examples, highlighting the potential environmental and economic benefits associated with these opportunities;
- Continued support from external organisations and experts, for businesses considering valorisation options;
- Reviewing legislation so that it adequately recognises the currently underutilised element of valorisation (into new products) within the waste hierarchy;
- Continued investment in the EU bioeconomy to ensure the development of viable valorisation technologies and methods.

Voluntary Agreements

As new food waste VAs are set up across the world (e.g. Sweden, Denmark, Germany, South Africa) it is imperative that we address some of the most frequent challenges they face, to ensure desired FLW reduction outcomes are realised by the VAs. Some of the most relevant approaches are:

- Ensuring new VAs follow core principles and well-described fundamentals for the establishment of successful VAs;
- Enlisting government support and ensuring the most appropriate lead organisation is selected

⁴² Source: https://wwfeu.awsassets.panda.org/downloads/wwf_wrap_halvingfoodlossandwasteintheeu_june2020__2_.pdf

- Ensuring VAs are adequately resourced to assist signatories in delivering targets and developing new best practice where needed;
- Continuously revising the dynamics of the VA and understanding the mechanisms necessary to ensure high levels of engagement (subsequently achieving impact);
- Setting ambitious yet realistic goals; and
- Further developing appropriate methods to monitor and evaluate progress.

Complementary policy interventions

- Common Agricultural policy: Some of the key elements that could be considered when designing CAP interventions for FLW are:
 - The need to perform a critical revision of the existing direct payments and investment support, which could be unwantedly stimulating (either directly or indirectly) overproduction and market saturation, thus constituting a structural barrier to being able to address FLW.
 - Sectorial interventions, particularly when targeting producer organisations, could provide funding support for, inter alia:
 - i) technological innovations allowing to transform and valorise sub-products and food waste, or to better match production with demand;
 - ii) developing marketing strategies to minimise on-farm food waste and open new markets which can absorb occasional over-production.
 - A few rural development measures should be specifically targeted to FLW, including investment support, knowledge exchange and innovation, or cooperation between actors in the food supply chain.
- Stronger regulations
 - Laws prohibiting food waste: e.g. France, Spain, Italy
 - Obligatory reduction targets
- National food waste strategies

For Industry

- Actively measure, report and ideally also make public their operational FLW data.
- Ensure that the measurement approaches adopted are transparent, robust and accurate.
- Invest in technological solutions and activities for FLW reduction and prevention, with the support of expert organisations offering advice and guidance.
- Encourage supply chain partners to measure (and publish) their FLW and engage in FLW reduction and prevention activities within their own operations.
- Actively participate and invest resources in voluntary agreements, to help ensure their success and the dissemination of best practice FLW reduction and prevention approaches.
- Identify, explore and invest in valorisation opportunities from unavoidable FLW streams to recover valuable resources.
- Engage and collaborate with farmer organisations and cooperatives to diminish on-farm and early supply chain food losses and waste.
- Communicate the importance of FLW reduction and prevention, on the global stage and within their own industry sectors, including the financial benefits expected.

For NGOs

- Provide another voice and pressure group to campaign for parts of the food system (primary producers, processors, retailers, distributors, restaurants and food services, households, governments, etc.) to measure and report FLW data.
- Encourage and publicly recognise businesses who make their FLW data public and engage in reduction and prevention strategies.
- Assist government to communicate the necessity of robust FLW measurement and methods which can be used to measure FLW across various stages of the food supply chain.
- Reframe FLW measurement and reduction as a method to promote action to improve function of the food supply chain, highlighting the environmental, economic and social benefits of measurement.
 - »Raise awareness of valorisation options and infrastructure available to farmers, manufacturers, processors and retailers, and highlight relevant case studies.

- Advocate for the correct use of the food waste hierarchy, campaigning to make sure food waste prevention rather than treatment is always the highest priority.
- Lead or be a 'critical friend' for a voluntary agreement around food waste, ensuring high levels of participation are maintained and help agreements successfully meet defined targets.
- Ensure industry is transparent in the actions taken towards voluntary agreement targets; and work to ensure businesses provide robust food waste measurements.
- Advocate for an integrated policy environment that diminishes the risks of FLW from farm to fork, providing incentives to adopt corrective measures where they are needed most.

For Governments

- Work with businesses, NGOs and civil society organisations to ensure the most consistent and robust measurement and regulation of FLW across Europe.
- Provide support and seed-funding to establish FLW voluntary agreements and easy-to-use reporting systems.
- If voluntary agreements and measures are not sufficiently effective to achieve the goals of SDG 12.3 due to e.g. a lack of ambitious targets or insufficient participation from industry, national governments should introduce legal and binding requirements for businesses over a certain size to measure and report their company's food waste figures.
- Identify and correct policy disincentives that favour FLW energy recovery over valorisation options.
- Provide funding support for research and innovation in FLW measurement, reporting and valorisation technologies.
- Allocate agricultural policy funding to FLW prevention action, for farmer cooperatives and other stakeholders, while addressing structural barriers like overproduction and market saturation.
- Develop ambitious but realistic FLW prevention programmes and strategies at all relevant levels of government (municipal, regional, national, etc.).
- Adopt innovative policies and commit to binding FLW diversion and prevention targets that align with (or go beyond) SGD12.3.

For the Research Community

- Develop new valorisation research streams to promote whole food utilization.
- Fill data gaps and standardize reporting of FLW data in order to better compare results, create benchmarks and provide clearer direction for governments, industry and NGOs.
- Assess the impact of FLW interventions and solutions to improve the evidence base of what works and the return on investment.
- Develop sector-specific FLW guidance that provides the motivation and technical information needed for industry and government to act.

For All

- Engage with citizens to create society-wide awareness and understanding of the FLW problem.

4.5 Ask CHAT-GTP

Given the constant developments around the use of AI technologies, the literature review attempted to ask CHAT-GTP for recommendations related to reducing food waste. As this technology uses open, online resources, it's interesting to at least take note of what it came up with. This technology of course doesn't have a scientific basis, hasn't been reviewed, and doesn't use any references or citations. The following is a full reproduction of five questions (prompts) to CHAT-GTP.

Q1. Write 10 recommendations on what national government should do to prevent food waste in the food supply chain

1. Establish a national strategy on food waste prevention, setting clear goals and a timeline for implementation.
2. Create a national food waste data collection system to measure and track the sources, causes and levels of food waste.

-
3. Strengthen regulations to reduce food waste in the food supply chain, such as through improved packaging, storage, and transport standards.
 4. Increase funding for research and innovation in food waste prevention, such as developing new technologies and practices.
 5. Encourage food businesses to measure and reduce their food waste by providing incentives, such as tax breaks or grants.
 6. Establish national public-private partnerships to share resources and best practices for food waste prevention.
 7. Establish clear labelling and date marking requirements on food products to reduce confusion and support consumers in buying and using food before it spoils.
 8. Promote food donation and redistribution programs to increase the accessibility of nutritious food to those in need.
 9. Educate consumers on the importance of reducing food waste and provide tips and strategies to reduce it.
 10. Support the development of new food products and services that reduce food waste, such as food recovery apps and subscription-based services.

Q2. Write 1000 words on justifying obligatory reporting of food waste amounts in the food supply chain

Food waste has become an increasingly pressing issue as global population increases and resources become more limited. It is estimated that around one-third of food produced for human consumption is lost or wasted each year, leading to a huge waste of resources and money, as well as an environmental impact. As a result, it is essential that food waste is addressed and reduced. One way to do this is to introduce obligatory reporting of food waste amounts in the food supply chain. This would involve the requirement of food producers, retailers and distributors to report the amount of food waste they generate annually. This would allow for a greater understanding of the scale of food waste and its sources, thus making it easier to target efforts to reduce it. The primary benefit of introducing obligatory reporting of food waste is that it would create transparency in the food supply chain. This would allow for any inefficiencies in the system to be identified and addressed. For example, it may be found that a certain retailer is generating more food waste than others, indicating an issue with their ordering or storage processes. This information can then be used to make improvements and reduce the amount of food waste generated. Obligatory reporting would also help to incentivise businesses to reduce their food waste. Knowing that their waste will be reported and made public, businesses would be encouraged to minimise the amount of food waste they produce. This could be done by monitoring their ordering and storage processes, as well as introducing measures such as donating surplus food to charity or using it in other products. This could help to reduce the amount of food waste produced and encourage a more sustainable approach to the food supply chain. Finally, introducing obligatory reporting of food waste would provide the necessary data for governments to implement more effective policies and regulations. Having an understanding of the scale of food waste and its sources will enable governments to target efforts to reduce it in the most effective way. This could involve introducing incentives for businesses to reduce their food waste, such as tax breaks or subsidies, as well as introducing regulations to ensure that food waste is minimised. In conclusion, obligatory reporting of food waste amounts in the food supply chain is an important step to reduce food waste and make the food supply chain more sustainable. It will create transparency in the system, incentivise businesses to reduce their food waste and provide governments with the data necessary to implement effective policies and regulations. As a result, it is essential that obligatory reporting of food waste is introduced.

Q3. Write 300 words on how a national government can improve data collection on food waste amounts in the food supply chain

Data collection on food waste amounts in the food supply chain is essential for understanding both the causes and the scale of food waste in a country. To improve data collection, a national government can take a number of steps. First, they can create a national food waste data collection framework. This framework should set out clear definitions of food waste, as well as the methods to be used for data collection. It should also include guidance on how to report food waste data and ensure that it is collected on a regular and consistent basis. Second, the government can require all food producers, wholesalers and retailers to report their food waste data to the national government. This can be achieved through regulations or incentives

such as tax breaks for companies that meet certain food waste reporting standards. Third, the government can invest in the development of technological solutions for collecting, storing and analysing food waste data. These solutions can be used by food producers, wholesalers and retailers, as well as by the government itself. Fourth, the government can promote education and awareness campaigns to encourage stakeholders in the food supply chain to reduce food waste, as well as to collect and share data on food waste. Finally, the government can collaborate with other national governments, regional and international bodies to share best practices in food waste data collection and to identify areas in which food waste can be reduced. By taking these steps, a national government can ensure that accurate and up-to-date data on food waste amounts in the food supply chain is collected and shared. This data can then be used to inform the development of policies and initiatives to reduce food waste and ensure that food is used in a more sustainable way.

Q4. Write in 400 words an explanation on how marketing standards influence food waste in farmer to supermarket relations

Marketing standards refer to guidelines used by food retailers and wholesalers to define the quality and safety requirements of food items that are sold in their stores and other outlets. These standards are used to ensure that the products they purchase are of a certain quality and that they meet certain safety requirements. The use of stringent marketing standards has had a significant impact on how food waste is produced and handled in relationships between farmers and supermarkets. The standards set out by supermarkets are intended to ensure that only high-quality and safe food is sold in their stores. As such, farmers must adhere to these standards in order to get their produce into supermarkets. This means that produce that does not meet the specified standards is rejected, resulting in food waste. Furthermore, supermarkets often require farmers to adhere to specific packaging and labelling requirements. This means that farmers must package and label their produce in a certain way in order for it to be accepted by supermarkets. If the packaging or labelling does not meet the standards set out by supermarkets, then the produce is rejected and food waste is produced. In addition, supermarkets often require farmers to supply them with a certain amount of produce. If the quantity of produce supplied is not up to the required standard, then the produce is rejected and food waste is produced. This can be particularly problematic for small-scale farmers, who often cannot produce the quantity of produce required by supermarkets. Finally, supermarkets often require farmers to provide a certain level of consistency in their produce. This means that farmers must ensure that the quality of the produce they supply is consistent so that it meets the standards set out by supermarkets. If the quality of the produce is inconsistent, then the produce is rejected and food waste is produced. Overall, the use of stringent marketing standards by supermarkets has had a significant impact on how food waste is produced and handled in relationships between farmers and supermarkets. The standards set out by supermarkets often lead to produce being rejected and food waste being produced, which can be particularly problematic for small-scale farmers who are unable to meet the quantity and consistency requirements set out by supermarkets.

Q5. Describe how an integrated approach of the theory of change can support the development of a national programme on food waste prevention

An integrated approach of the theory of change can support the development of a national programme on food waste prevention by providing a roadmap to guide the design and implementation of the programme. This roadmap should include a clear statement of the desired outcomes, a description of the necessary policy and legislative environment, the identification of key stakeholders and their roles and responsibilities, and the development of strategies to mobilise resources, create change, and measure impact. The theory of change should also include a description of the processes and activities needed to address the underlying causes of food waste, such as inadequate infrastructure, unbalanced diets, and unsustainable production and consumption patterns. This includes a detailed outline of the behaviour and attitude changes needed to reduce food waste, and a plan to measure progress. The theory of change should also recognise the importance of a holistic approach to food waste prevention, which includes considerations of the environmental, economic, and social impacts of food waste. This includes an understanding of the food supply chain and how different actors within it interact, and the need to consider the impacts of waste on communities, the environment, and the economy. Finally, the theory of change should be informed by a comprehensive evaluation of the existing evidence base related to food waste prevention, including best practices from other countries

5 Inspiration from parallel transitions

5.1 National Circular Economy Programme

In 2016, the Netherlands was one of the first countries in the world to formalise in policy its ambition to achieve a circular economy, with the government-wide programme 'Circular Dutch economy by 2050'. This was an agenda-setting programme: it defined an objective and served to raise awareness in society. It clearly generated broad support for a circular economy, as evidenced by the signing of the Natural Resources Agreement (endorsed by over 400 parties). This agreement articulated the ambition for 2050, and five transition agendas came out of it: Consumer Goods, Plastics, Construction, Manufacturing, and Biomass and Food. The Circular Economy Implementation Programme 2019-2023 translated these transition agendas into concrete interventions and projects up to 2023. The National Circular Economy Programme 2023-2030⁴³ builds on these solid foundations.

The reference points and interventions around food waste under this programme are set out below. They focus on continuing with the four interventions as agreed under the collaboration with Food Waste Free United (STV), and on committing to legally binding targets under the Farm to Fork Strategy and for the entire food supply chain. Specifically, this means advocating in Brussels for a mandatory halving of food waste by 2030, and the inclusion of the primary production sector in efforts to tackle food waste.

Terugdringen van voedselverspilling

Nederland heeft zich gecommitteerd aan Sustainable Development Goal 12.3 van de VN: voedselverspilling in 2030 halveren ten opzichte van 2015. In de Voedselbrief van maart 2021 staat dat een blijvende inzet nodig is om het doel te halen. Vermindering van voedselverspilling draagt significant bij aan voedselzekerheid en het verminderen van de CO₂-voetafdruk van het voedselsysteem. Het beleid van LNV richt zich voornamelijk op de succesvolle bundeling van activiteiten onder de Stichting Samen Tegen Voedselverspilling. LNV wil de hiervoor ontwikkelde aanpak doorzetten en zowel bij consumenten als in de keten een verdere reductie van voedselverspilling realiseren, langs vier actielijnen: 1) meten en monitoring, zowel nationaal als Europees; 2) het bundelen van krachten in de keten; 3) consumenten helpen om verspilling te verminderen en 4) het veranderen van 'spelregels' die het tegengaan van voedselverspilling belemmeren. Daarnaast gaat Nederland zich inzetten voor juridisch bindende doelstellingen onder de Farm To Fork-strategie en voor de gehele voedselketen.

Figure 15: Reducing food waste.

Source: National circular economy programme 2023-2030 (page 117)

⁴³ Source: <https://www.rijksoverheid.nl/documenten/beleidsnotas/2023/02/03/nationaal-programma-circulaire-economie-2023-2030>

Tabel 28: Maatregelen op het gebied van biomassa en voedsel

	Normeren	Beprijzen	Stimuleren
Voortzetting en intensivering van beleid			
We geven uitvoering aan de Bossenstrategie.	■	■	■
We geven uitvoering aan de Nationale Eiwitstrategie.	■	■	■
We zetten een systematiek met kritische prestatie-indicatoren op.	■	■	■
We zetten meer in op reststromen bij bijvoorbeeld een veevoeder.	■	■	■
We maken beter gebruik van eiwit van eigen land om minder afhankelijk te zijn van externe inputs.	■	■	■
We verhogen de efficiency van nutriënten en verminderen de emissies naar water, bodem en lucht.	■	■	■

Figure 16: Continuation and further development of policies.
Source: National circular economy programme 2023-2030 (page 118)

	Normeren	Beprijzen	Stimuleren
Nieuwe maatregelen			
We plegen inzet op juridisch bindende doelstellingen onder de Farm to Fork-strategie.	■	■	■
We maken afspraken met de ministeries van BZK, EZK en LNV over het ontwikkelen van een waardeketen voor biobased bouwmaterialen.	■	■	■
We doen onderzoek naar de wijze waarop een aanvullend verdienmodel via koolstofcertificaten kan bijdragen aan het versterken van het verdienmodel van de agrarische sector.	■	■	■

Figure 17: New measures.
Source: National circular economy programme 2023-2030 (page 118)

5.2 Protein transition

The protein transition is closely linked to the National Protein Strategy (NES). The NES was prompted by an objective at the European policy level to reduce dependence on imported high-protein crops. Within the Netherlands, the NES aims to “increase self-sufficiency in new and plant-based proteins over the next 5 to 10 years, and to do so in a sustainable way that contributes to the health of humans, animals and the natural environment.” It’s a comprehensive approach that will also contribute to circular agriculture, the quality of soils and biodiversity in the Netherlands, sustainable livestock farming and a strong agri-food economy, fewer greenhouse gas emissions and less food waste, and a more sustainable, healthy and plant-based diet among Dutch consumers. The latter element is the *Protein Transition*, or the “social movement towards more plant-based protein consumption.” This movement is expected to contribute not just to a healthier and more sustainable diet, but also to the capacity of the Netherlands and Europe as a whole to meet their own protein needs.

This objective is also in line with advice from, for example, the Health Council (more plant-based proteins, fewer animal products, better health and environmental outcomes), the Transition Agenda for Biomass and Food (2018; which, alongside the protein transition, also cites the reduction of food waste as an important element of climate policy and the circular economy) and the Climate Agreement (2019; which aims to reduce the footprint of protein produced in the Netherlands by 50% by 2050).

At this point the government has not articulated within the NES a quantitative target for the protein transition. The roundtable on Agriculture and Land Use has argued in favour of reversing the current protein consumption pattern (60% animal protein, 40% plant-based according to RIVM, the Institute for Public Health and the Environment) so that it becomes 60% plant-based and 40% animal protein by 2050. There are also calls from civil society (specifically the Food Transition Coalition) for the government to set out a clear and ambitious vision: to move from the current 60/40 ratio for animal/plant-based protein consumption, to 50/50 by 2025 and 40/60 by 2030.

The three forums mentioned above have set out specific pathways to achieving this protein transition. The Climate roundtable assigns much of the responsibility for this to supermarkets:

Supermarkets promote climate-friendly products in their stores, positioning them as the 'easiest and standard choice' for consumers. They contribute specifically to the protein transition and encourage consumers to consume more plant-based proteins (60%) relative to animal products (40%) as well as products from the healthy eating pyramid, in line with the Prevention Agreement. They also play an active role in the Sustainable Food Alliance, for both implementation and monitoring.

The following interventions have been agreed as a way of achieving consumer behaviour change:

- Detailed descriptions of all interventions should be accessible in a centralised database from 2021, preferably the Centre for Healthy Living (CGL) database held by the Institute for Public Health and the Environment (RIVM).
- Thorough analyses of subsets of behaviours that fall within climate-friendly food consumption should be conducted to inform the selection of interventions and to identify any possible interventions that have been overlooked. Government agencies and public bodies and institutions, working together under the auspices of Food Waste Free United, will provide the financial resources and organisations capacity to ensure that their sustainability interventions are preceded by a behavioural test, and followed by an evaluation. Particularly when it comes to the design of pilots, which by definition are meant to test interventions, participating parties will ensure that evaluative guidance is underpinned by thorough research. This intervention should be linked to the KIA innovation working group (Behavioural research).
- Coordination of behavioural change to address issues relating to the climate, food waste and the Prevention Agreement. Clear messaging towards consumers will be crucial to bringing about behavioural change. This will require regular coordination between the various parties responsible for changing behaviour to address issues relating to: food waste, the Prevention Agreement and the Climate Agreement. The Association of Netherlands Municipalities (VNG) can play a role in ensuring the provision of a consistent message to consumers in regional initiatives as well.
- The government is a participant as a food buyer through its procurement policies (e.g. through corporate catering), and as part of that it should establish targets and action plans to procure more climate-friendly food.
- Community initiatives should be mutually reinforcing as a way to achieve greater impact on climate and healthier food.

The Food Transition Coalition has made similar recommendations to the government:

1. Establish a clear vision (50/50 in 2025, 60/40 in 2030)
2. Establish solid objectives for the protein transition in relation to consumption and the food environment
3. Develop a roadmap, prepare an implementation plan and encourage coalition building for implementation
4. Monitor progress and results
5. As the government, set a good example
6. Use food environments as a focal point for approaching the protein transition
7. Focus on linking health and sustainability, agriculture and food, and consumption and production in policy
8. Use policy to develop economic opportunities

-
9. Ensure there are laws and regulations to promote the protein transition and a healthy and sustainable food environment such as
 - a. Financial incentives
 - b. Reward trailblazers, revise Wages and Salaries Tax Act (cheap/free healthy work lunches)
 - c. Curb advertising of animal products
 - d. Support the private sector
 - e. Legislation around indirect food waste and responsible land use
 10. Support initiatives that contribute to the protein transition
 - a. Benchmark for supermarkets
 - b. Benchmark for employers/catering
 - c. Tools for food providers
 - d. Tools for municipal authorities
 - e. Continue and transform the National Fruit and Vegetable Action Plan so it's geared towards more plant-based and less animal-based
 - f. Reposition Dutch Cuisine
 - g. Organise a food summit

5.3 Mobility

Unlike the protein transition and energy transition, 'the mobility transition' is not something that's been clearly defined by the national government. The term is defined differently by different forums and organisations, with, for example, more emphasis on energy (cleaner forms), digitalisation/automation (autonomous driving, platforms), or more efficient use of infrastructure and equipment (alternatives to car, Mobility as a Service peak spreading). The Ministry of Infrastructure and Water Management distinguishes between three related transitions in the field of mobility: the circular economy, smart and green mobility, and climate adaptation⁴⁴.

The stated objective around sustainable mobility is a zero-emission mobility sector by 2050, prompted by the Climate Agreement and European directives (Green Deal). The pillars and relevant instruments associated with the planning of this policy in the Netherlands are⁴⁵:

- Active and more sustainable mobility, including by making travel behaviour more sustainable (details yet to be determined), subsidies for major employers who commit to compensating for CO₂ emissions, and encouraging cycling through financial incentives, campaigns and better infrastructure.
- Encourage zero-emission (electric) passenger cars by providing funding for charging infrastructure, incentive schemes for the purchase of electric cars, phasing out fossil fuel vehicles, and using behavioural influences and communication.
- Making transport/logistics more sustainable through, for example, financial incentives for zero-emission driving (making fossil fuel vehicles poorer value for money, and zero-emission vehicles better value for money), investments in charging infrastructure, zero-emission zones in cities, sector-specific approaches (e.g. for making the construction sector more sustainable), and a commitment to digitalisation (sharing cargo information through Basic Data Infrastructure).
- Use of sustainable energy carriers, such as biofuel blending, and setting excise taxes based on the sustainability of energy carriers.

All of these initiatives will explicitly try to align with European policies, and the Netherlands wants to push for policy coherence in the EU (e.g. around charging infrastructure) to achieve sustainable cross-border mobility. In many cases the tools still need to be determined, but will also include 'softer' forms of steering (supporting covenants and action programmes) alongside 'harder' requirements/prohibitions (e.g. phasing out fossil fuel vehicles) and financial incentives (subsidies and taxes).

⁴⁴ Source: <https://open.overheid.nl/documenten/ronl-db16e5f0-25b7-4ab7-8ba3-e93db3b8471e/pdf>

⁴⁵ Source: https://www.eerstekamer.nl/overig/20220517/beleidsprogramma_infrastructuur_en/document3/f=/vltae94xqbza_opgemaakt.pdf

Local management is even more important for the mobility transition than it is for food waste. Some examples of national policy key focus areas that will need to be shaped locally include zero-emission zones, the improvement of local infrastructure and public transport.

At the municipal level, 'the mobility transition' tends to be translated more often into strategy: For example, The Hague has its Mobility Transition Strategy 2022-2040⁴⁶, and in its annual *Position Papers*, the Association of Netherlands Municipalities calls on the national government (in particular the Ministry of Infrastructure and Water Management) to make mobility more of a key focus area of policy-making, with recommendations such as:

- End the compartmentalisation of mobility (2021): Consider mobility and accessibility in relation to housing, the use of space, and climate challenges; invest in road safety and enable municipalities to achieve the goals set out in the Climate Agreement.
- Pay per use should be differentiated to take into account transport alternatives and to avoid transport poverty (2022). Municipalities want to work towards reducing and changing transport movements and making them more sustainable. Pay per use is a good way of doing this but using a flat charge based on a kilometre rate isn't effective.
- Government: work with us on Regional Mobility Programmes (RMP) to shape the regional mobility transition (2022). If all stakeholders make a firm commitment to the RMPs, we could save between 5.4 and 8.5 Mt of CO₂. That's 3.2% to 5.2% of the Netherlands' total CO₂ emissions and it's actually more than half of the remaining reduction target for the mobility sector
- Investing in cycling: now keep moving and provide structural funding (2022). Municipalities want agreements on a substantial structural state contribution to the implementation of the National Cycle Vision through a joint cycling programme as part of the Multi-Year Programme for Infrastructure, Spatial Planning and Transport (MIRT). Unfortunately, the €6 million that the government wants to make available for this from 2024, is disproportionate to the €13 billion required.
- Number of road accidents continues to rise: we need to act now (2022). The government is making €200 million available to improve road safety on the national highways (N roads). However, no additional funds have been allocated for road safety on local roads, even though there's a clear need for interventions to improve road safety here too, given that accident rates continued to rise significantly in 2022.

5.4 Climate and energy

As energy is an important part of climate policy, they are being considered together here. The interventions discussed are summarised in Table 8. This included looking at climate agendas and coalitions from 2011 to 2022. These show that establishing shared goals is essential for approaches to get off to a good start in practice. It's also important to involve citizens in this: they, too, should be aware of the challenges around saving energy and reducing greenhouse gas emissions.

Climate policy uses an approach that features 'climate ambassadors'. Their role is to approve funding for initiatives set up by citizens, businesses, and scientists. If these projects are successful, they can then get follow-up funding so they can be scaled up. The idea is for these projects to create positive, permanent changes in our society that can combat climate change.

In 2010, a Crisis and Recovery Act (CHW) was introduced as a way of accelerating the agenda and supporting investments in infrastructure. The procedures for sustainable projects in the construction sector are becoming faster and shorter. This will enable more sustainable houses to be built. The consultations also revealed the need to simplify procedures and funding applications. The government could play an important role in facilitating this.

Collaboration is essential if we are to address climate, energy or food waste issues. On the one hand, this will enable us to achieve a circular economy, while on the other it will also help to create a level playing field

⁴⁶ Source: <https://denhaag.raadsinformatie.nl/document/10877149/1#search=%22RIS310664%22>

between companies as well as between countries. Without this, we could see imbalances and skewed relationships, making it difficult to achieve our objectives. One example would be moving a factory to a country where climate policy is much weaker, or even absent altogether. Those companies would then have an unfair advantage on the global market.

So if we are to accelerate change, it also seems to be important for the market to include trailblazers who are eager to make those changes happen. That's true for food waste, and it's therefore crucial to ensure that those players remain motivated. They act as role models and leaders within their sectors.

An important step in encouraging change is to make undesirable behaviour more expensive or more difficult relative to the desirable behaviour (or vice versa: make the desirable behaviour easier). People tend to go with whatever is familiar and easiest (Broek, 2022). If change takes too much effort, it's less likely that the transition will succeed. We also know that people will put more effort into not losing something they already have (e.g. money) than they will into earning something of the same value (*loss aversion bias*) (Broek, 2022). With this in mind, the Emissions Trading System (the European mechanism for trading in emission allowances), which requires companies to pay fines for their greenhouse gas emissions, would work better than a similar system with bonuses for companies with lower emissions.

The energy transition included a decision to phase out biomass energy as soon as possible. This biomass is partly based on food waste. That means it's important for a whole variety of sectors to prevent and reduce food waste. Indeed, by 2030 it's expected that hardly any biomass will be used for electricity generation. Until then, energy production from biomass will remain broadly stable (Milieu Centraal, 2023).

During times of transition, companies often need financial support to help them achieve the objectives of an ambitious agenda. It's no different for the climate and energy transition. Investments in innovations, research, and subsidies that can help drive behavioural change are all part of the mix. One such positive behavioural change that will contribute to achieving the objectives of the agenda is a move towards a circular economy. The role of the government (provincial/municipal) is shifting from management to facilitation. Under the climate policy, Green Deals are approved by climate ambassadors. These Green Deals are project-level agreements with companies, other organisations and government institutions that are funded by and aligned with the climate agenda. Successful projects can be scaled up through the wider network of municipalities and provinces and contribute to the agreements made under the next round of Green Deals. It's important for this to involve multiple ministries coming to agreements with municipalities, companies and individuals. Sustainability has now been embedded in the municipal executive programmes of 95% of municipalities, and 75 municipalities have already established plans aimed at achieving climate neutrality and are working on their implementation (Ministry of Infrastructure and the Environment, 2011). Accelerating the agenda requires collaboration in the pursuit of common goals.

But if we are to come up with solutions, we need the right people, with the right expertise and capabilities. That's why a key focus area under the climate agenda is ensuring that there are enough trained people. We need to consider the kind of expertise required to address the challenge of reducing waste, and develop it within the education system. To implement this, it's essential that the agenda sets out key focus areas and themes. This will provide an overview of what we need to work on, and will guide the collaboration between different organisations and agencies.

If these steps have been taken and the objectives still haven't been achieved, we will just have to do more, such as establishing penalties or consequences to encourage positive behavioural change and to discourage negative behaviour – like the ETS, for example, which forces companies to pay for their emissions and therefore incentivises innovation. A similar system could be developed to reduce food waste by making companies pay for their waste and thus incentivise them to reduce it. This would reduce the total amount of food waste produced. At an individual level, it would be more challenging to introduce as there are fewer opportunities for monitoring and enforcement.

Finally, it was noted that under the energy policy people were more enthusiastic about contributing to the energy saving programme when there were tangible incentives. The more tangible these incentives are, the easier it is to get people to take action.

Table 8: Action taken against climate change (including energy) vis-à-vis food waste.

Interventions	Climate	Energy	Food waste
Increasing motivation in the sector	Raise ambitions and set an agenda with clear goals		
Continuing to run campaigns	Everyone’s doing their bit (2019)	Turn it down a notch	Food Waste Week
Prevention - desirable behaviour	Reducing greenhouse gas emissions	The best energy is saved energy	Preventing food waste.
Appointing ambassadors	Climate ambassadors approving Green Deals		
Accelerating the agenda		Crisis and Recovery Act (CHW): faster, shorter procedures for companies, encouraging innovative and sustainable projects in the construction sector (houses using less energy and/or more sustainable energy)	Faster and shorter procedures also came up in the consultations. Establishing faster and shorter procedures for companies could encourage the development of initiatives.
Working with other countries to achieve economic viability for stakeholders: a level playing field between countries	Climate Agreement: an international agreement creates a level playing field for reducing greenhouse gas emissions. Consider the emission allowances that only work if they are applied internationally.	Climate Agreement: explore the options for phasing out and, where possible, ending financial incentives for fossil fuels. We’re doing this with other countries as much as possible, bearing in mind our business climate.	International competitiveness also plays an important role in food waste. Rules and regulations lay the foundation for a level playing field between value chain participants and between countries. This makes trade fairer.
Getting trailblazers to work together (NL)	Binding, bespoke agreements with the 10 to 20 largest emitters of greenhouse gases		The first 25 companies in Food Waste Free United (STV).

Table 8: continued

<p>Making undesirable behaviour more expensive than desirable behaviour (or vice versa: make the desirable behaviour more appealing / easier)</p>	<p>Increasing the marginal tax on top of the price in the European Emissions Trading System (ETS).</p>	<p>Supply of renewable energy sources; reduce the use of woody biomass for energy purposes as soon as possible; construction of 2 new nuclear power plants; realisation of sustainable heating networks at the neighbourhood level</p>	<p>Reducing food waste can help reduce the use of biomass for energy. Less food waste contributes to the objective of achieving climate neutrality.</p> <p>The desirable behaviour is incentivised in different ways.</p>
<p>Helping businesses to achieve the desirable behaviour and the established objectives</p>	<p>Helping SMEs to become more sustainable</p>		<p>Reducing food waste is an option for achieving sustainability</p>
<p>Investing in innovations and research that contribute to the desirable behaviour</p>	<p>Investing in research and innovation for climate-neutral technologies</p>	<p>Investing in research and innovation for climate-neutral technologies</p>	<p>Investing in research into technical solutions that contribute to the circular economy</p>
<p>Developing a circular economy and an implementation programme.</p>	<p>Developing a circular economy and an implementation programme.</p>	<p>Adjust distance standards for the construction of onshore wind turbines; encourage participation (including financially) of local residents to strengthen support.</p>	<p>Development of circular food chains - Waste streams from one supply chain are a raw material for another in an economically viable scenario</p>
<p>Getting provinces, municipalities, scientists, businesses and citizens to work together</p>	<p>Green Deals are written, approved by climate ambassadors and implemented under the climate agenda The successful Green Deals are scaled up. Green Deals can also be implemented at the EU level.</p>	<p>For example, collective heating projects can be partly funded by a national subsidy scheme, thereby ensuring affordability for households.</p>	<p>Collaboration among provinces and municipalities with businesses and civil society initiatives could accelerate the reduction of food waste. Develop Green Deals wherever possible.</p>
<p>Role of the state, provinces and municipalities</p>		<p>Cooperative energy association: role of municipalities moves from management to facilitation.</p>	

Table 8: continued

<p>Ensuring we train people who can contribute to the challenge</p>	<p>A prerequisite for an ambitious climate policy is having enough skilled workers - not just now, but also as we head towards 2050. We will work with educational institutions, government agencies and public bodies, and social partners to train skilled workers and, where necessary, retrain or upskill them</p>		<p>Identifying the type of professionals needed to accelerate food waste reduction.</p>
<p>Establishing key focus areas and themes</p>	<p>These key focus areas and themes are the foundation for an action plan and for partnership development.</p>		
<p>Establishing penalties or consequences to encourage desirable behaviour</p>	<p>Companies must pay (ETS) if they fail to reach targets; incentivise to actively take measures to reduce emissions. The ETS is managed by the Netherlands Emissions Authority (NEa).</p>	<p>For example, the National Insulation Programme; poorly insulated homes may eventually no longer be rented out; blending requirements for green gas in the gas grid.</p>	<p>The development or tightening of legislation against food waste, overseen by an independent body.</p>
<p>Participation</p>		<p>People's sense of satisfaction is significantly greater when they receive a firm offer to make their homes more sustainable, and when the participation process better meets their needs.</p>	

6 Conclusion

With 6 years and 9 months to go, the Netherlands faces the significant challenge of halving food waste by 2030, and thereby achieving Sustainable Development Goal (SDG) 12.3.

At the current rate, food waste will not be halved by 2030; instead, it will stand at 949-2,016 kt, rather than the 886-1,276 kt aimed for. By 2023, we should have reduced food waste by at least 28.1% in order to stay on track, but at the current rate that figure is projected to be between 11.9-26.1%. To achieve our aspiration of halving food waste, by 2025 we need to have accelerated progress so that food waste is at least 34.4% less than it was in 2015 (1,162 – 1,674 kt).

Food waste is a complex issue and it overlaps in many ways with other issues such as climate change, water use, land use, biodiversity, etc. Reducing waste therefore directly affects the objectives contained within those related issues. Waste can be translated into energy use, raw material use, greenhouse gas emissions, water use and other KPIs. Reducing waste by a third would facilitate better use of global agricultural land, and could even reduce it: if you're not producing food destined to be wasted, you can make more efficient use of land and raw materials. There's a clear relationship, but the underlying quantifications and calculations aren't available yet. This is not so much because we lack conversion factors or calculation methods, but because the quality of data around food waste is still too weak to enable calculations at the sectoral or product level. Greater efforts will be needed around this in the near future. The recommendations provided above offer a broad array of opportunities for getting (many) more organisations and companies engaged with the issue and having them scale up their efforts, with a specific role for the government to play too.

References

Broek, Eva van den (2022). Behaviour Change. Part of the course: Lost Harvest: Wasted Food. November 2022.

Milieu Centraal (2023). Biomass: a sustainable energy source? | Milieu Centraal. Accessed on 8 February 2023.

Ministry of Infrastructure and the Environment (2011). Working on the climate.

Annex - Report on external consultations

Comprehensive overview of report on “Accelerating the Food Waste Agenda | External consultations | process and reflection”, as drafted by Mariken Gaanderse, Fonkeling, 2 February 2023.

Introduction

Wageningen Food & Biobased Research (WFBR) is conducting research commissioned by the Sustainable Food team at the Ministry of Agriculture, Nature and Food Quality (LNV) to support its policymaking. The research aims to provide the Ministry with input on policy priorities for tackling food waste in the Netherlands from 2022-2025, with a perspective towards 2030 (SDG 12.3). The study aims to identify the necessary systemic interventions for the achievement of interim and longer-term policy objectives. The team at WFBR is itself heavily involved in the Dutch food waste movement. The team therefore engaged me as an external process coach for this project, so that I could facilitate the process while also ensuring transparency and objectivity. I was approached specifically to facilitate the external consultations and guide the process around them.

As a process coach, I have led and facilitated many large strategy sessions and processes for INGOs, universities, government agencies and public bodies, companies and boards. I understand the dynamics of large organisations, including political ones, and am able to navigate them.

I have also set up and organised many events (some small ones, others involving more than 1000 people), labs, hackathons and design sprints. My role in these events was to bring different worlds together and create space for meaningful exchange. These experiences have enabled me to make a good comparison of this process against other ones and to share some personal observations about these external consultations.

In this paper, I briefly outline the process for the external consultations that we set up and went through as a team, and then I share some reflections on the process.

The team involved in this part of the project (the external consultations) consisted of:

- Dr Hilke Bos-Brouwers - senior researcher in sustainable supply chains
- Mr Thom Achterbosch - senior researcher in sustainable food systems
- Dr Bob Castelein - researcher and project leader in sustainable supply chains
- Josianne Cloutier MSc - researcher in post-harvest management
- Sanne Stroosnijder MSc - programme manager in food loss and waste prevention

It's worth mentioning that these team members were selected for their background and expertise, and that we explicitly considered researchers who have not previously worked on projects involving Food Waste Free United (STV). This allowed them to approach the issue from a fresh perspective.

We built in moments of reflection at regular intervals with Toine Timmermans at Food Waste Free United (STV) and with Melody Baeriswyl and Tessa Ooijendijk at the Ministry of Agriculture, Nature and Food Quality (LNV), to ensure that they were involved and kept in the loop during the process and also to give them the opportunity to guide and contribute to the process, based on their roles and expertise.

Process

As part of this team process we took the following steps together to achieve the best possible result within the time available.

- Variety of conversations

We started by conducting meetings with team members and with Toine Timmermans and Melody Baeriswyl to create a clear picture together of the focus of this research and of the external consultations, and to jointly come up with a shared vision of the context of this assignment.

- Co-creation sessions with the team

During these initial co-creation sessions, we worked together as a team to create a timeline setting out the key steps in the process. We also worked together to identify the key topics to focus on for the external consultations. The focus areas we selected are as follows:

- How can we accelerate the food waste agenda?
 - How can we elaborate and strengthen the agenda? What can we expand and build on?
 - What role can the Ministry of Agriculture, Nature and Food Quality (LNV) play in this as a system player, given the firm targets it has for 2030?
 - How can we also explicitly involve 'unusual suspects' and ask them for input?
- 2-pager

The team produced a clear 2-pager so that the external participants we wanted to invite could be provided with a clear framework of the question, and to ensure that participants were all starting from the same point of reference.

- Stakeholder analysis

In a subsequent co-creation sprint, we determined as a team who we wanted to invite and carefully considered the tone of voice of our invitation. We then collectively drew up a long list of players and started looking for contacts among them. To a large extent we were drawing on our own network but we also proactively reached out to people through LinkedIn. As a team, we then looked at who we should each invite, and we then sent personal invitations including the 2-pager. We also set up an online registration page with the relevant information, and all registered participants received a calendar invitation.

- Interactive consultation sessions

Then, as a team, we started to determine how best to design the sessions and worked out the necessary scripts and formats. These structures and formats were then reviewed with Toine and Melody, and any necessary modifications were made.

This eventually led to us selecting the following structure for the external consultations:

- Joint short online kick-off on 18 October

In a short online session, we provided a clear context for our search, explained what the Ministry of Agriculture, Nature and Food Quality (LNV) had asked for, and discussed our role in it and the next steps. The team prepared a PowerPoint presentation for this, complementing the 2-pager. This was later shared with the participants along with the recordings of the online session. Recording this session meant that anyone who couldn't attend this particular one could still participate in the in-depth follow-up sessions.

- In-depth online sessions on 2, 4 and 8 November

We organised these in-depth sessions on three different dates to give participants as many options as possible (bearing in mind that it was a busy time of year). This also gave us the opportunity to work in smaller groups and make the sessions really interactive. Each session was identical in terms of its structure, duration and format, but the diversity of the participants meant that each one had very different outcomes. The sessions all started with a short presentation on the question and process. We then produced Mural boards and the sessions were also recorded (for personal use) and further studied afterwards.

- Outcomes

Following the in-depth sessions, the team gathered, marked up and interpreted all the input in a team session. They were then able to meticulously collate these interim outcomes into a number of categories.

- Interim session with the Ministry of Agriculture, Nature and Food Quality (LNV) on 8 December
Once these initial outcomes had been collated by the team, they were presented along with the outline for the final session on 15 December. We then discussed what specific in-depth questions the Ministry would still like to ask the external participants during the final session, and the main issues it wanted to focus on during this session.

- Final in-person session on 15 December
During the final session, we first had people get to know each other and share their perspectives in an interactive way. We then once again set out the frameworks and process, and shared the outcomes of the earlier in-depth sessions using clear clusters. We then broke up into small groups and asked the participants to consider each cluster and add anything they thought was still missing. They also worked together to identify the most dynamic and high-potential areas, and were asked to consider what role the Ministry of Agriculture, Nature and Food Quality (LNV) could play in this. We then discussed in a plenary session the specific areas where the Ministry could take the lead and how it could provide support in other important areas where it would not be taking the lead. The afternoon concluded with informal drinks.

The team once again captured and developed the various clusters and discussed the key insights together in a sprint session.

Based on this input, the team will now start work on the provisional final report for the Ministry of Agriculture, Nature and Food Quality (LNV).

Reflections on the process

To conclude, some reflections on the process from myself as the external facilitator:

- Thorough research

I've facilitated a great many strategy sessions over the years and this one stood out for its thorough and meticulous approach. This is clearly a scientific team with a scientific approach. Every insight was carefully considered and meticulously interpreted. This included paying close attention to what was not said. WUR's legitimacy was never questioned during the external consultations.

I did not sense any doubt among the participants regarding the team's independence and credibility on this topic. This is something that does regularly occur in similar consultations but it was not an issue here. People considered WUR to be an obvious and qualified player for the purposes of this research.

- Team effort

The process was a great team effort. The team worked together well and also complemented each other very well in terms of their input. It was great to see how everyone was able to contribute to the process in their own way, both in terms of their input perspectives and in the skills they brought to the table. It was a smooth process and there was plenty of space for people to share their specific knowledge, skills and experience. This made the process not just a pleasure to participate in, but also very thorough from my point of view.

- Alternating online and offline sessions

Participants appreciated the diversity of formats and types of sessions. It worked well to start with a short online session, and to then provide various options for the in-depth online session before finally meeting physically one more time, when we were able to also incorporate a networking element to the process. This approach enabled people to participate fully and exposed them to a range of other perspectives and points of view. The tools used were also found to be easily accessible. The 2-pager, the online Murals, the PowerPoint presentations and the posters during the physical session. It allowed us to gather a lot of information from all the participants in short sprints, and there was a high rate of participation.

- Transparency

Participants were appreciative of the level of transparency shown by the team throughout the process. The process was clearly explained, there was room to ask questions, the outcomes of the sessions were shared openly, and there was always plenty of room for reflection and input.

- Outreach

These external consultations enable us to reach a large number of people. This included not just the people who actually participated in the consultations, but also the many people we reached with our invitations and the 2-pager. Many participants who couldn't actually participate did still respond to turn down the invitation, and it was clear that they had read it. As such, they are among the people we were able to reach with this issue.

- Variety of participants

Despite the short amount of time we had available for these external consultations, we were able to involve a good variety of diverse participants. Participants came from a range of different types of organisations and they brought a diversity of experience to the process. This, in turn, generated a diverse range of insights. The atmosphere and attitude during the consultations was very open, with people willing to listen to each other and bringing in their own perspectives without riding their own hobby horses. Participants showed a real willingness to take part, especially considering that this was during the busy year-end period. This topic was clearly one that many participants felt was important.

- Unusual suspects

We were able to involve a number of 'unusual suspects' in the process too. This was considerably trickier to do. A number of people pointed out that this topic was not a priority for them (which is of course why they are 'unusual suspects' in the first place). We were able to persuade a few of them through a personal approach, but some still dropped out because they didn't feel it was sufficiently part of their wheelhouse. In the future, it might be useful to build in a separate strategy and in particular allow more time to persuade players working on social transitions in other sectors to take part. For some of the players approached in this instance, the process was too heavily focused on food waste. I can imagine it might be interesting to organise a separate session around social transitions and how we can accelerate them, but focusing explicitly on multiple social transitions. The outcomes could then be translated into the food waste agenda. There wasn't enough time for that now (especially given the busy end-of-year period).

- Cross-cutting, systemic and relevant to multiple ministries

One emphatic finding that came out of this process is that this is a cross-cutting issue and that it's therefore important to continue to focus on involving a range of different types of players in the future. Of course, even at the start of the process it was already clear that this is a systemic issue that touches on several other 'ecosystems'. Putting the substantive analysis of these outcomes to one side, what this means is that any follow-up research needs to allow enough time to focus on involving those other ecosystems. As we pointed out with the 'unusual suspects', this could require a separate approach, one that includes considering what substantive focus or issues would work best to get those players involved, as well as the language and tone of voice. Officials from ministries other than the Ministry of Agriculture, Nature and Food Quality (LNV) have participated throughout this process. They routinely made it clear that the Ministry of Agriculture, Nature and Food Quality (LNV) was taking the lead and that they were largely taking part on an individual level. Some of these participants indicated that other ministries could definitely be more involved in the food waste agenda (more on this in the substantive analysis). This does however suggest that even with this type of issue, it's still important to look at the possibilities for setting up a cross-ministry task force with relevant officials from different ministries with a collective mandate to work on this type of issue.

- Social transitions

One specific idea for the Ministry of Agriculture, Nature and Food Quality (LNV) would be to plan a cross-cutting workshop, possibly with other ministries, to share ideas about successful strategies or tactics to accelerate social transitions. This would be an opportunity to discuss different transitions and how to approach them, and to share experiences.

- Political process

Discussions with the Ministry revealed that alongside substantive, evidence-based recommendations, it's important to create political support and a sense of urgency. What this process has shown very clearly is that there is a widespread sense of urgency on this issue and cross-sectoral willingness to move forward on it. It's also clear that participants regularly mentioned the important role that the Ministry of Agriculture, Nature and Food Quality (LNV) can play in this regard. These external consultations have shown clear evidence of this widespread support, and the substantive analysis of the outcomes will provide specific tools and tactics. However, we have not conducted a deeper political analysis. It would be advisable for civil servants to consider internally the strategic steps that might be taken to ensure that these recommendations are taken on board and adopted in policy.

- Momentum

A large number of participants participated enthusiastically in this process. A powerful group of players have become re-engaged with the issue. There is clear momentum to continue to engage with this group of players and to involve them in any follow-up. It will be important for the Ministry of Agriculture, Nature and Food Quality (LNV) to provide clear feedback about follow-up steps so that this engagement can be maintained and strengthened. The Ministry took on more of a listening role throughout this consultation. As part of the follow-up process, it will be important for the Ministry to be visible and explicitly involved. Participants in the consultations also indicated this. They explicitly asked that trailblazers be encouraged and supported, and that the communities behind those trailblazers be inspired to take action.

To explore
the potential
of nature to
improve the
quality of life



Wageningen Food & Biobased Research
Bornse Weilanden 9
6708 WG Wageningen
The Netherlands
E info.wfbr@wur.nl
wur.nl/wfbr

Report 2451



The mission of Wageningen University & Research is “To explore the potential of nature to improve the quality of life”. Under the banner Wageningen University & Research, Wageningen University and the specialised research institutes of the Wageningen Research Foundation have joined forces in contributing to finding solutions to important questions in the domain of healthy food and living environment. With its roughly 30 branches, 7,200 employees (6,400 fte) and 13,200 students and over 150,000 participants to WUR’s Life Long Learning, Wageningen University & Research is one of the leading organisations in its domain. The unique Wageningen approach lies in its integrated approach to issues and the collaboration between different disciplines.
