European Environment Agency

# Preventing waste in Europe
# Progress and challenges, with a focus on food waste

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# Key messages

- Between 2010 and 2022, the amount of waste generated in the EU increased, but considerably less than the economy. More specifically, the amount of waste generated divided by the EU's economic output declined by 13%, with most of the reduction taking place between 2020 and 2022. However, sectoral trends in waste generation show considerable variation. This is influenced by multiple policies and further analysis is needed to identify the specific drivers behind these patterns.

- Policies in waste prevention are interconnected with other policy areas, thus highlighting the need for a systems approach. For instance, climate-related policy measures, rather than waste prevention, have significantly contributed to reducing combustion waste. On the other hand, waste prevention has significant potential to mitigate climate impacts as it leads to a reduction in greenhouse gas emissions throughout the products' entire value chain. Furthermore, preventing non-recyclable municipal solid waste can help achieve municipal waste recycling targets.

- Measures in national waste prevention programmes in Europe still predominantly rely on soft policy instruments, such as voluntary initiatives, agreements and informational campaigns. Despite the link between waste generation and economic growth, market-based instruments remain underused, accounting for only 6% of the total policy instruments alongside extended producer responsibility (EPR) at 2%. Combining multiple instruments can enhance the overall effectiveness of a waste prevention program.

- EU Member States are required to evaluate their waste prevention programmes every six years, yet this process is often inconsistent or lacks transparency. This makes it difficult to assess the effectiveness of these policies. Additionally, there is limited information on the expected impacts of specific measures, the effectiveness of policy instruments and the resources allocated at the national level.

- EU Member States are actively implementing measures to prevent food waste. 62% of the prevention-at-source initiatives focus on raising awareness and educational initiatives. Market-based measures (4%) and regulatory interventions (1%) are less-used to foster prevention at source. While there is room for improving data collection, mandatory reporting of food waste generation in the EU is improving data. Reliable data are crucial for enabling Member States to meet the proposed EU food waste reduction targets.

# Executive summary

Waste prevention is central to the circular economy and plays a critical role in addressing climate change, biodiversity loss and pollution. It helps reduce resource extraction, manufacturing and transportation, and lowers carbon emissions. Because of this, waste prevention protects natural ecosystems and enhances the EU's strategic autonomy and materials supply security.

The Waste Framework Directive (WFD) prioritises waste prevention as the most effective strategy for reducing environmental impacts and improving resource efficiency. It mandates Member States to implement waste prevention programmes (WPPs). These programmes promote sustainable consumption, improve product design and reduce the use of harmful substances. A key objective is to decouple economic growth from waste generation.

Mandated by the WFD, the European Environment Agency (EEA) evaluates and reports on EU waste prevention policies in a biennial report. This report assesses policy implementation and waste generation trends as well as progress towards decoupling ([1]) waste from economic growth and advancing a circular economy. Using an indicator framework, the report presents the latest data and highlights trends, challenges and best practices. Particular attention is given to food waste, providing an in-depth analysis of progress and challenges in this area. This focus is especially timely considering the proposed food waste reduction targets in the revised WFD.

Between 2010 and 2022, waste intensity — the amount of waste generated per unit of economic activity — declined by 13%, with an 8% reduction taking place between 2020 and 2022. This indicates a modest decoupling of waste generation from economic activity, as waste generation has increased at a slower rate than the economy. While reductions in combustion waste are closely linked to declining fossil fuel use, decoupling is most evident in the manufacturing and service industries. In contrast, waste generation in the waste and water sectors continues to rise regardless of economic trends. Further analysis is needed to understand the sector-specific drivers behind these trends.

Waste prevention policies do not operate in isolation but are closely linked to other policy areas, thus highlighting the need for a systemic approach. For instance, reductions in combustion waste have been largely driven by climate policies rather than dedicated waste prevention measures. At the same time, waste prevention itself plays a crucial role in mitigating climate change by reducing greenhouse gas (GHG) emissions across the value chain. Preventing non-recyclable municipal solid waste (MSW) also supports progress towards recycling targets. However, the impact of the COVID-19 pandemic on consumption and waste patterns has been more pronounced than that of existing waste prevention measures; this underscores the need for a more comprehensive and effective policy framework.

([1]) Decoupling refers to the relationship between economic growth and waste generation. Absolute decoupling occurs when waste decreases despite economic growth; relative decoupling occurs when waste increases but at a slower pace than the economy, while no decoupling occurs when waste generation grows at the same or a faster rate than the economy (EEA, 2023b, 2021).

Despite the importance of waste prevention, current WPPs continue to rely predominantly on voluntary initiatives, agreements and informational campaigns, which account for 81% of all identified measures in Member States' WPPs. Despite the link between waste generation and economic growth, market-based instruments remain underused, accounting for only 6% of total policy instruments, alongside extended producer responsibility (EPR) at 2%. Strengthening economic incentives and regulatory approaches would likely enhance the effectiveness of waste prevention efforts.

The evaluation of WPPs remains inconsistent across EU Member States, making it difficult to assess their effectiveness. Although EU legislation requires a review every six years, formal evaluations are rare or are not publicly available. Additionally, information on the expected impacts of specific measures, the effectiveness of policy instruments and the level of allocated resources remains limited. Strengthening evaluation practices is essential for driving forward real progress.

Progress is being made in food waste monitoring and reporting, helping address data gaps and inconsistencies. The introduction of EU-wide food waste reporting lays a solid foundation for setting national reduction targets. Reliable data are critical for quantifying food waste, identifying hotspots, understanding the share of edible food waste and analysing food supply chain inefficiencies. These insights are essential for designing more targeted and effective prevention policies.

Food waste prevention efforts across Member States primarily focus on awareness-raising and education, which account for 62% of all initiatives. However, market-based measures (4%) and regulatory interventions (1%) remain marginal. Furthermore, few Member States integrate food waste prevention with biodiversity and climate strategies, missing key opportunities for synergies. Enhancing knowledge-sharing, assessing links and providing guidance on policy integration could strengthen the impact of prevention measures.

For more efficient resource use, Member States should align their actions with the 'food use hierarchy' while recognising interconnections between its levels. While some food waste treatment will always be necessary, priority should be given to higher value uses. Surplus food should be prioritised for food donation or animal feed rather than recycling or anaerobic digestion. This approach ensures resource efficiency and supports recycling targets, while prioritising environmental and ethical outcomes.

This report consists of two main parts. Chapter 2 presents the overall progress towards waste prevention, with the main findings summarized in section 2.2.1. Chapter 3 provides a more specific insight into food waste prevention, with conclusions and reflections outlined in section 3.6. The key messages for each of these chapters are listed at the beginning of their respective sections (Chapters 2 and 3).

# 1 Waste prevention in Europe

The Waste Framework Directive (WFD) prioritises waste prevention as the most effective strategy for enhancing resource efficiency and reducing the environmental impact of waste generation. It emphasises the importance of decoupling economic growth from waste generation and advocates for policies that support this objective. Additionally, the directive mandates EU Member States to implement waste prevention programmes (WPPs). These programmes aim to reduce waste through measures that focus on sustainable consumption, better product design and the reduction of harmful substances in products.

Waste prevention is a key component of the circular economy and is essential in tackling the triple planetary crises of climate change, biodiversity loss and pollution. Reducing the extraction of raw materials, manufacturing and transportation lowers carbon emissions and helps preserve natural habitats, which are often harmed during resource extraction, thus protecting biodiversity. Additionally, waste prevention strengthens the EU's strategic autonomy and material supply security.

## Box 1

**Definition of 'prevention'**

This report uses definitions from within the WFD.

'Prevention' means measures taken before a substance, material or product has become waste that reduce:

(a) the quantity of waste, including through the re-use of products or the extension of the life span of products;

(b) the adverse impacts of the generated waste on the environment and human health; or

(c) the content of harmful substances in materials and products.

The European Environment Agency (EEA) is mandated by the WFD Directive 2008/98/EC (as amended in 2018) to evaluate and report on the progress of the waste prevention policy across the EU. This includes publishing a biennial report that reviews the implementation and effectiveness of the WPP in each Member State and at the EU level. The report assesses trends in waste generation, progress in decoupling waste generation from economic growth and advancements toward a circular economy. These evaluations support the identification of challenges, the exchange of best practices and the development of policies aimed at achieving sustainable resource management and waste prevention.

Under this mandate, three consecutive reports have been published. The 2021 report examined textiles as a rapidly growing waste stream associated with unsustainable consumption patterns. The 2023 report introduced an indicator framework to monitor waste prevention efforts. This 2025 report builds on the established framework, updating it with the latest available data to offer insights into current

waste prevention trends. Additionally, it places a thematic focus on food waste, providing an in-depth analysis of progress and challenges in this area. This focus is particularly timely considering the upcoming food waste reduction target in the revised WFD. Preventing food waste is critical for mitigating the effects of climate change, biodiversity loss and pollution; it also enhances food security by making more resources available to those in need.

Against this background, this report:

- Updates the indicator framework with the latest available data from Eurostat (up to November 2024) and waste prevention profiles based on national WPPs updated at the end of 2024 (EEA, 2025) to assess whether waste generation is being decoupled from economic growth. This is explored in Chapter 2. Detailed figures and tables from Chapter 2 are provided in Annex 2.

- Provides specific insights into food waste prevention, measurement and reporting. This is examined in Chapter 3 and builds upon country information gained via national WPPs, questionnaires sent to Eionet ([2]), and information on the EU food loss and waste prevention hub.

- Offers an overview of national WPPs. This is presented in Annex 1 Overview of WPPs.

([2]) The European Environment Information and Observation Network (Eionet) is a partnership network of the EEA and its 38 member and cooperating countries. The EEA and Eionet gather and develop data, knowledge and advice to policymakers about Europe's environment. For more information see: https://www.eionet.europa.eu.

# 2 Tracking waste prevention progress

**Key messages**

- From 2010 to 2022, total waste (excluding major mineral waste) in the EU-27 increased by 3% per capita, while GDP per capita grew by 17%. This suggests a modest decoupling of waste generation from economic growth.
- Waste generation and economic activity are closely intertwined. For instance, the pandemic led to a significant drop in EU consumption and waste generation in 2020, but waste generation rebounded in 2022.
- The relationship between waste generation and economic activity varies across sectors. Climate-related policies, which have reduced reliance on solid fossil fuels, have influenced combustion waste in the energy sector. Meanwhile, waste from services and manufacturing decreased. Finally, waste from the waste treatment and water sectors continues to rise independently of economic trends.
- Waste prevention measures in Europe still predominantly rely on soft policy instruments, such as voluntary initiatives, agreements and informational campaigns. These comprise 81% of all identified measures in the national waste prevention programmes. EU Member States are required to evaluate their waste prevention programmes every six years. Yet this process is often inconsistent or lacks transparency, which makes it difficult to assess policy effectiveness.
- Market-based instruments, such as subsidies and financial incentives, remain underused. They account for only 6% of the total policy instruments alongside extended producer responsibility (EPR) at 2%.

## 2.1 Evaluating progress using the waste prevention indicator framework

Waste prevention monitoring goes beyond tracking waste reduction. It involves assessing waste generation alongside other metrics, such as waste prevention efforts or economic indicators like gross domestic product (GDP), to determine if environmental impact is decoupled from economic growth. Additionally, waste prevention monitoring considers resource use, material footprints and consumption levels as well as value retention strategies to reduce material and product consumption.

In 2023 the EEA presented an operational framework for monitoring waste prevention progress and whether waste generation is being decoupled from economic growth (EEA, 2023b). The framework is structured around indicators chosen to track waste prevention efforts and progress and follows the definition of waste prevention according to WFD Directive 2008/98/EC. The indicators address the social, economic and environmental systems that drive production and consumption, and generate waste. They are presented in three clusters:

1. the system context: key socio-economic activities that generate waste;

2. policy enablers: waste prevention measures that impact Cluster 1; and

3. waste output: waste generation.

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The indicator framework can be found below in Figure 2.1.

**Figure 2.1 Indicator framework**

| Cluster 1: System context | Cluster 2: Policy enablers | Cluster 3: Waste output |
|---|---|---|
| **Population**<br>Average population — total<br><br>**GDP**<br>Main GDP aggregates per capita, chain-linked volumes<br><br>**Household final consumption expenditure**<br>Final consumption expenditure of households by consumption purpose (COICOP 3 digit), chain-linked volumes<br><br>**RMC**<br>Material flow accounts in raw material equivalents and by final uses of products — modelling estimates<br><br>**Value added from reuse, repair, and recycling**<br>Gross value added (GVA) related to circular economy sectors, value added at factor cost (aggregated indicator as available on Eurostat)<br><br>**Turnover in repair sectors**<br>Annual detailed enterprise statistics for repair services | **Presence of each type of measure**<br>in WFD Article 9 (1), categorised by policy instrument type*<br><br>**Presence of targets**<br>categorised by policy instrument*<br><br>**Presence of indicators**<br>categorised by policy instrument*<br><br>**Development and evaluation of waste prevention programmes over time**<br>For a specific waste stream:<br><br>a. Presence of each type of measure in WFD Article 9 (1), categorised by policy instrument type*<br><br>b. Presence of targets categorised by policy instrument*<br><br>c. Presence of indicators categorized by policy instrument* | **Total waste**<br>Excluding major mineral waste — tonnes per year, in total and per capita<br><br>**Waste intensity of net waste volume**<br>Without major mineral waste — per GDP unit, kg per thousand EUR per year<br><br>**Municipal waste generation**<br>kg per capita per year<br><br>**Residual municipal waste**<br>kg per capita and per cent of waste generated<br><br>**Weight of reuse**<br>kg per capita, in total and per product category<br><br>**GHG emissions from waste management**<br>GHG emissions by source sector for selected waste management categories<br><br>**Substances of very high concern**<br>in products placed on the market<br><br>**Food waste**<br>kg per capita |

* Number of Member States out of all 27 of them

**Notes:** GDP, gross domestic product. COICOP, classification of individual consumption by purpose. RMC, raw material consumption. GHG, greenhouse gas.

**Source:** EEA, 2023b.

In this report, the framework is applied to assess whether further progress has been made. The assessment is structured as follows. Key findings and reflections are presented in Chapter 2.2.1, followed by a presentation of data and analysis. Chapter 2.3 presents potential improvements and the remaining limitations of the monitoring framework. Additionally, an overview of EU Member States' WPPs is provided in Annex 1, while detailed figures and tables of the indicator results are available in Annex 2.

## 2.2 Insights about waste prevention in the EU-27

### *2.2.1 Main findings and reflections*

From 2010 to 2022, total waste in the EU-27 (excluding major mineral waste) increased by 3% per capita. During the same period, economic growth, measured by GDP per capita (and corrected for inflation), rose by almost 17%. Along with a gradual decline in waste intensity ([3]) relative to GDP, these trends indicate a modest decoupling ([4]) of total waste generation (excluding major mineral waste) from economic growth.

The impact of the COVID-19 pandemic further underscores the link between economic activity and waste generation. The pandemic and the associated economic slowdown in 2020 led to a sharp decline in consumption and waste generation. However, as economic activity rebounded, waste generation increased again in 2022. This indicates that the pandemic had a more significant impact on waste levels than existing waste prevention measures, highlighting the role of behavioural shifts during lockdowns.

Waste generation trends vary across sectors. Combustion waste from the energy sector closely aligns with fossil fuel use in primary energy production. This suggests that climate-related policy measures, rather than waste prevention initiatives, have had a more significant impact on this type of waste generation, therefore highlighting the interconnectedness of policies and the need for a systems approach. Waste generation from services and manufacturing correlates with economic growth, though at a slower pace. In contrast, waste from the waste treatment and water sectors continues to rise independently of economic trends. Overall, the positive correlation between economic activity and waste generation is influenced by factors such as technological changes, the start-up or closure of large-scale industrial activities, and sector- and country-specific variables that warrant further investigation.

Over the long term, MSW has increased slightly, but at a slower pace than economic growth. Since 2010, there has been a notable reduction in residual waste; this is primarily due to decreased landfilling. Recent fluctuations in MSW outputs are likely linked to changes in reporting practices, definitions and the impact of COVID-19 lockdowns. Preventing non-recyclable waste within MSW could support the achievement of MSW recycling targets set by the WFD, as demonstrated by EEA reports (EEA, 2022, ETC CE, 2025).

All Member States have implemented policy measures under WFD Article 9(1)(d), focused on encouraging reuse and repair. The circular economy sector ([5]) has experienced steady growth over the past decade. This sector includes both reuse and repair, as well as recycling, which is not directly related to waste prevention. In 2023, Member States reported reuse data for textiles, electrical and electronic equipment (EEE), construction materials and furniture, along with policies aimed at promoting reuse. This marked the start of efforts to assess and quantify reuse activities. While the reporting process is still evolving, the data already offer valuable insights and is expected to improve as methodologies become more standardised over time

([3]) Waste intensity refers to the amount of waste generated per unit of economic output, typically expressed as kgs of waste per GDP EUR. It indicates the resource use efficiency and the decoupling of economic growth from waste generation.

([4]) Decoupling refers to the relationship between economic growth and waste generation. Absolute decoupling occurs when waste decreases despite economic growth; relative decoupling occurs when waste increases but at a slower pace than the economy, while no decoupling occurs when waste generation grows at the same or a faster rate than the economy (EEA, 2023b, 2021).

([5]) In this context, the circular economy is defined as a combination of activities that include recycling, repair and reuse, based on economic data (gross added value), as defined by Eurostat (2024t).

(EEA, 2024g). Even at their highest reported levels, per capita amounts of reuse remain significantly lower than those of recycling. This suggests that the circular economy sector continues to be primarily driven by recycling rather than by waste prevention initiatives.

GHG emissions from waste management are steadily declining. This is largely due to reduced landfilling. However, these reductions primarily reflect end-of-life waste management rather than waste prevention efforts. Waste prevention remains the most effective strategy for enhancing resource efficiency and reducing the environmental impact of waste generation. For example, focusing specifically on food waste prevention — such as achieving the proposed food waste reduction targets outlined in the WFD — could potentially result in a net reduction of at least -9.9 $MtCO_2e$ (carbon dioxide equivalent) (JRC, 2023a). This is equivalent to approximately 9% of total GHG emissions from waste management in the EU.

Waste prevention measures detailed in the national WPPs of the EU-27 Member States primarily focus on encouraging reuse and repair, with all programmes addressing these areas. Additionally, all but one WPP emphasise promoting sustainable consumption models and developing or supporting information campaigns. Together with measures to reduce food waste, these areas account for most policy instruments applied; this highlights the strong focus placed on them by Member States. The increased focus on food waste prevention is likely driven by greater attention at the EU level, as prompted by new reporting requirements and the proposed food waste reduction targets highlighted in the revised WFD.

Waste prevention measures still predominantly rely on soft policy instruments, such as voluntary initiatives, agreements and informational campaigns, which comprise 81% of all identified measures. Despite the link between waste generation and economic growth, market-based instruments remain underused, accounting for only 6% of the total policy instruments, alongside extended producer responsibility (EPR) at 2%. Combining multiple instruments can enhance the overall effectiveness of a waste prevention program. For example, regulatory measures that are supported by informative campaigns will ensure better compliance and help increase understanding among stakeholders.

Despite efforts to improve the waste prevention monitoring framework — such as disaggregating total waste by economic activity and improved availability of datasets for specific waste streams (for example, food waste and reuse) — several limitations remain. These include diverse and non-harmonised national programmes, as well as uncertainties about the implementation and timing of specific measures. While Member States are required to evaluate their WPPs every six years, this is often not done consistently, or evaluations are not made publicly available. This hinders the development of a robust evidence base to assess the effectiveness of policy measures. Additionally, there is a lack of information on the expected effects of specific measures and proposed policy instruments at the national level. Further improvements are necessary to address these issues.

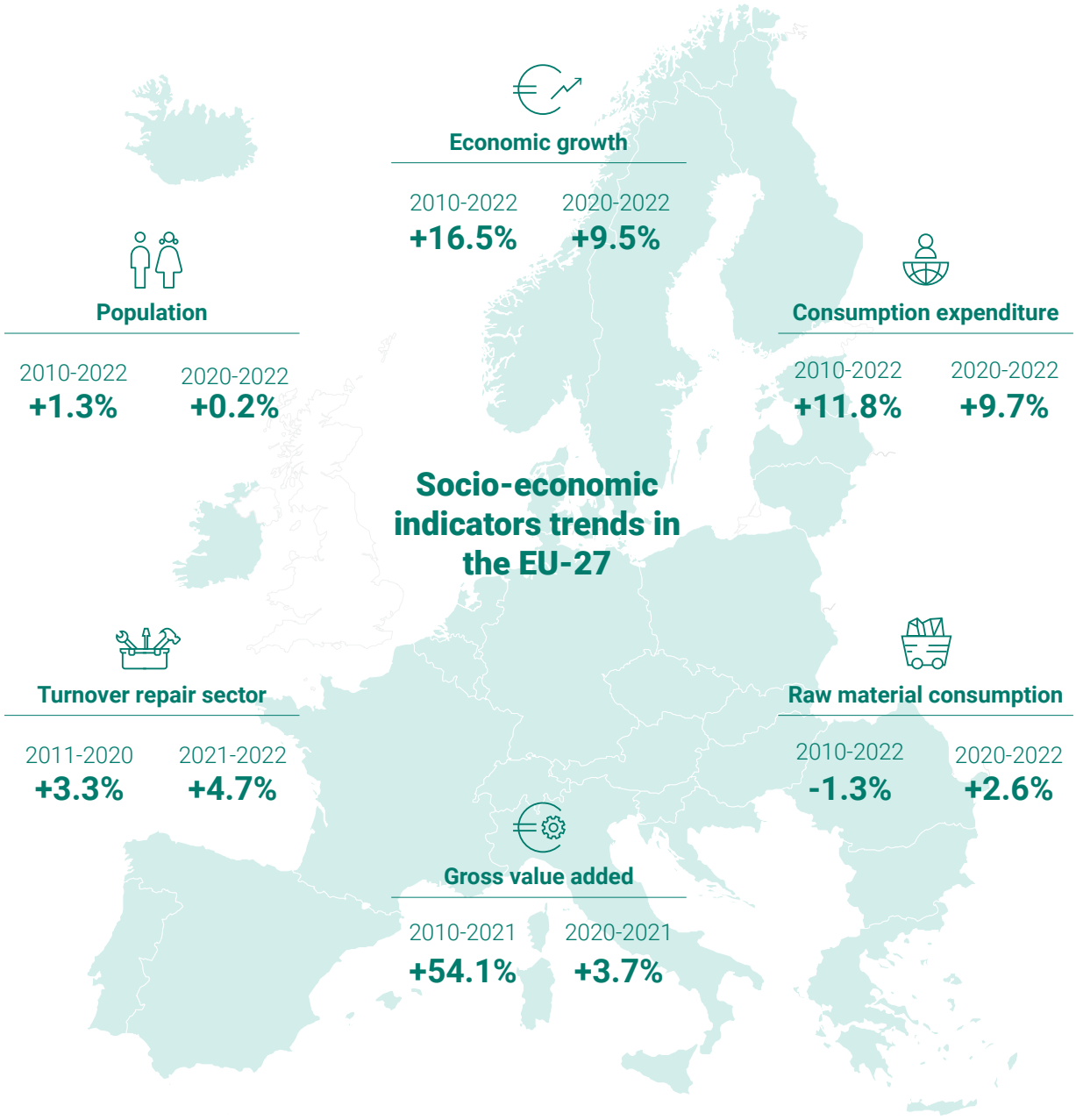
### *2.2.2 System context*

This section aims to update the socio-economic indicators that affect waste generation with the latest available figures. Detailed graphs for each indicator can be found in Annex 2.

Between 2010 and 2022, the socio-economic landscape of EU-27 was shaped by two significant events — the COVID-19 pandemic from early 2020 and Russia's invasion of Ukraine in February 2022. Though the 2008 economic crisis is outside the time frame of this analysis, the effects on the European economy could be seen until approximately 2013.

The indicators most affected by these events were economic growth, classification of individual consumption (expenditure) by purpose (COICOP) and gross value added (GVA), as shown in Figure 2.2. There was slower growth between 2020 and 2022 compared to between 2010 and 2022. The raw material consumption (RMC) decreased between 2010 and 2022. Between 2020 and 2022, there was a slight increase, although the change was minimal.

**Figure 2.2** **Socio-economic indicator trends in the EU-27**




**Source:** Author's compilation based on data from Eurostat extracted in November 2024.

### *Increase in EU-27´s population in 2022*

From 2010 to 2022, the EU-27 experienced a small 1.3% growth in population, which was largely attributed to increased migration. This means that despite a natural population decline (more deaths than births) since 2012, the overall population grew because more people moved into the EU-27 than out. These demographic shifts influence waste generation, with population growth potentially increasing waste streams, but considerably less than other drivers.

### *Increase in the GDP of the EU-27*

The GDP of the EU-27 grew by 16% from 2010 to 2022. Economic growth rates were reduced by the aftermath of the economic crisis that started in 2009, the COVID-19 pandemic in 2020/2021 as well as Russia's invasion of Ukraine. These economic changes impacted waste generation, as higher GDP often correlates with increased consumption and waste production, while economic disruptions can reduce waste generation due to reduced consumer spending and industrial activity.

### *Household final consumption expenditure (COICOP) returned to pre-pandemic levels*

Household final consumption expenditure accounted for 51% of GDP in 2021, making it the most significant component of GDP (Eurostat, 2023). Household final consumption expenditure is categorised based on its purpose, according to the COICOP. Between 2010 and 2022, household final consumption expenditure increased by 11.8% (Figure A2.3), with a sharp decline in 2020 due to the COVID-19 pandemic. However, by 2022, expenditure had returned to pre-pandemic levels, rising by 4.7% compared to 2021.

Household final consumption expenditure has remained focused on the same main categories since 2010: 'Housing, water, electricity, gas and other fuels', 'Food and non-alcoholic beverages', 'Transport' and 'Miscellaneous goods and services'.

Expenditure on 'Housing, water, electricity, gas and other fuels' rose steadily from 2014 to 2019. It levelled off in 2020 due to reduced spending on 'maintenance and repair of the dwelling' and 'water supply and miscellaneous services relating to the dwelling' and then stagnated in 2022, primarily because of lower expenditure on fuel. 'Transport' expenditure surged between 2014 and 2019 due to vehicle purchases; it dropped significantly in 2020 due to COVID-19 and then rose again from 2021. In 2022, it was restrained by reduced vehicle purchases.

Spending on 'Food and non-alcoholic beverages' peaked in 2020 and 2021 during the pandemic as more meals were prepared at home. It declined by 3% in 2022, returning to pre-pandemic levels. Conversely, expenditure on 'Restaurants and hotels' saw a sharp 34% increase between 2021 and 2022, reflecting a shift towards dining out after the COVID-19 pandemic.

These consumption patterns influence waste generation, as higher expenditure correlates with increased consumption of goods and services, which in turn generates more waste. For instance, the shifts in spending — such as increased spending on restaurants and decreased spending on food and beverages, potentially leading to less food being prepared at home and more in restaurants after the COVID-19 pandemic in 2021 — appear to closely align with food waste generation from households and restaurants (see section 2.2.4 and Figure A2.12).

### *Raw Material Compsumption has declined by 1.3% since 2010*

In 2022, 14.7 tonnes of raw materials were extracted per capita (Figure A2.4), reflecting a 1.3% decrease compared to 2010. However, this figure remained stable compared to 2021, with only a marginal decrease of 0.3%.

The construction sector has been the primary driver of material extraction over the past decade, accounting for 35% of the total RMC in 2022. Overall, the extraction of materials for construction increased by 20% between 2010 and 2022, despite some fluctuations during this period. Largely influenced by socio-economic trends in the construction sector, these fluctuations were marked by a decline between 2012 and 2017, growth from 2017 to 2020 and a subsequent decline after 2020. The second group with the highest RMC (10% of the total RMC in 2022) is 'Food, beverages and tobacco products'. The material extraction for this group has been decreasing since 2011 and in 2022 decreased by 14% compared to 2010. This decrease is mainly driven by the reduced use of crops (fodder and non-fodder crops), crops residues and grazed biomass.

These consumption patterns directly influence waste generation. Increased material extraction in the construction sector leads to more waste from building activities, while reduced extraction for 'Food, beverages and tobacco products' is associated with lower waste generation from agricultural residues.

### *Value added from reuse, repair and recycling (GVA) is nearly EUR 300 billion*

In 2021, the value added from reuse, repair and recycling reached nearly EUR 300 billion, marking a significant increase of over 50% compared to 2010 (Figure A2.5). However, since 2019, income from these activities has stabilised, with only a 4% increase in 2021 compared to the previous year. The relatively small income changes in 2019 and 2020 are likely attributed to the impact of COVID-19. Nevertheless, it seems that the circular economy sector (reuse, repair and recycling) continues to be primarily driven by recycling rather than by waste prevention initiatives. To better support waste prevention, it would be beneficial to exclude recycling from the dataset or replace this indicator with one that specifically reflects the waste prevention sector. However, such a dataset is not currently available.

### *Turnover in repair sectors remains stable*

The structural business statistics data are now presented in separate datasets starting from the reference year 2021. This change is due to significant methodological revisions, which prevent direct comparisons with earlier data.

The value of turnover in the repair sector was relatively steady between 2011 and 2020 (Figure A2.6). In 2020, it was at the level of EUR 22 billion; this is similar to the value in 2011, taking into account that in 2011, the turnover for the repair of watches, clocks and jewellery was not reported due to confidentiality. The highest turnover in the repair sector over the past few years was reported in 2017, when it reached EUR 26 billion. Computer and peripheral equipment repair comprised more than 40% of the total turnover in the repair sectors, making it the largest category.

In 2022, the turnover in the repair sector was approximately EUR 24 billion, reflecting a 5% increase compared to 2021. Electronics remained the most common product category undergoing repair in both 2021 and 2022. As the increase in turnover between 2021 and 2022 is only small, it appears that the EEE repair sector hasn't recovered from restrictions caused by the COVID-19 pandemic. However, the repair activities are expected to grow significantly in the coming years as in 2024 the directive promoting the repair of goods entered into force. Member States have to transpose and apply the directive from 2026 (EU, 2024; ETC CE, 2022).

### *2.2.3 Policy enablers*

This section aims to update indicators on policy enablers of the waste prevention framework. These indicators align closely with the prevention measures outlined in the WFD.

Robust and effective WPPs preferably combine different types of instruments that are complementary to each other due to the following reasons (Tojo, 2008; EEA - Eionet, 2021):

- Comprehensive coverage: different types of policy instruments allow different aspects of waste prevention to be addressed. Regulatory instruments are meant to enforce compliance while market-based instruments provide economic incentives. Voluntary instruments can encourage citizen and industry engagement, while informative instruments help raise public awareness and are also used to support the implementation of other types of instruments.

- Flexibility and adaptability: a mix of instruments allows for greater flexibility and adaptability in addressing different waste streams and sectors. This allows WPPs to be customised to specific needs and local or national contexts.

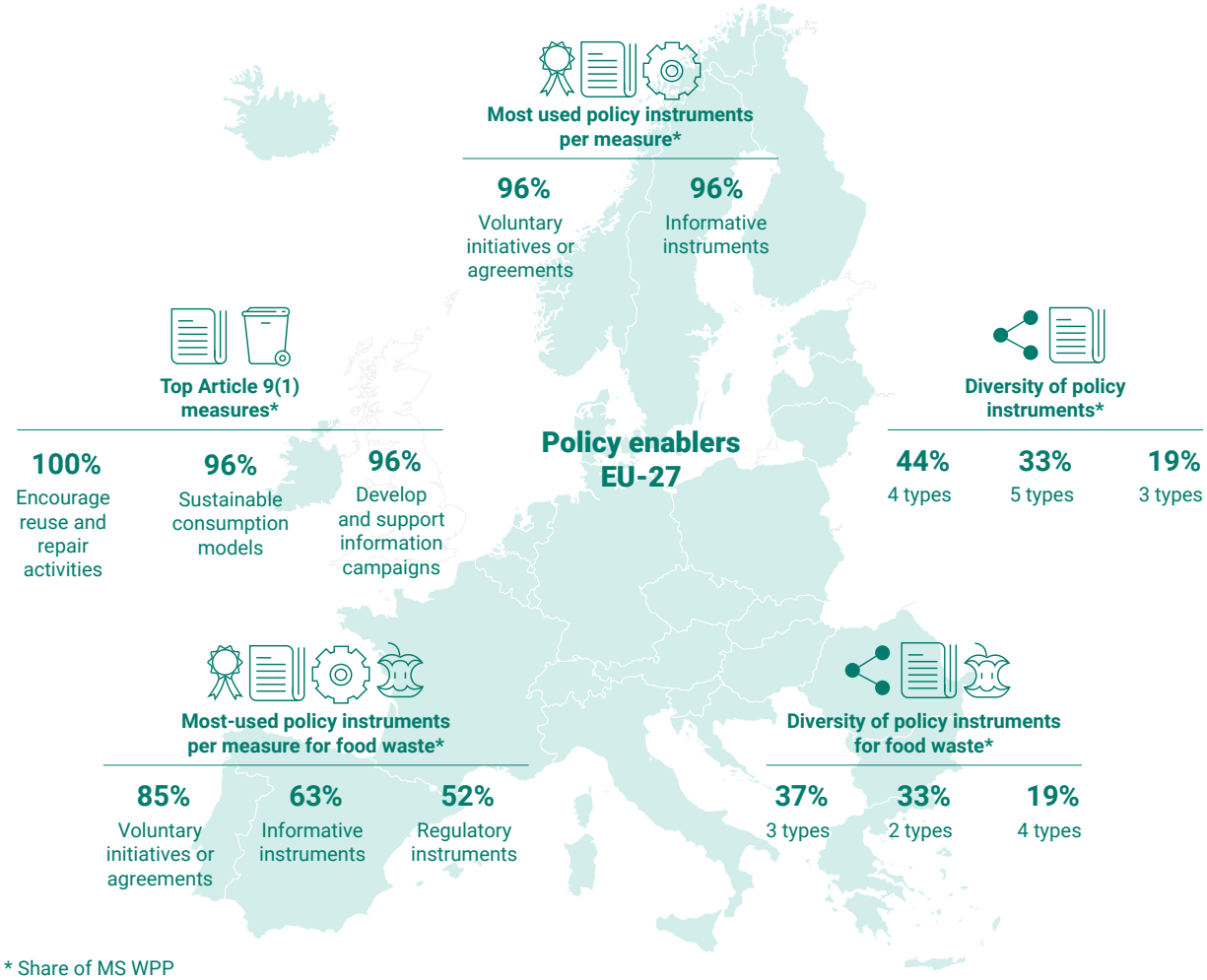
- Enhanced effectiveness: combining multiple instruments can enhance the overall effectiveness of a WPP. For example, regulatory measures that are supported by informative campaigns will ensure better compliance and help increase understanding among stakeholders.

- Stakeholder engagement: different instruments can engage a wider range of stakeholders, from businesses and consumers to local governments and NGOs. Such broad engagement is crucial for the successful implementation of waste prevention measures.

- Economic and environmental balance: such balancing can typically be reinforced by combining other instrument types with market-based tools.

The most commonly-addressed measure in the WPPs of EU-27 Member States is 'Encourage reuse and repair activities', which is included in all of them (see Figure 2.3). The most frequently-used policy instrument is 'Voluntary initiatives and agreements', applied to both generic prevention measures under WFD Article 9(1) and those that specifically target food waste prevention.

**Figure 2.3** **Policy enablers in the EU-27**




**Source:** Author's compilation based on data from WPPs of EU-27 Member States; EEA, 2025.

Table 2.1 presents the percentage of EU-27 countries that have incorporated waste prevention measures listed under WFD Article 9(1) in their WPPs. Article 9(1) categorises these measures based on the type of policy instrument used. The following instrument types are outlined: (1) regulatory, (2) market-based, (3) voluntary initiatives or agreements, (4) informative and (5) EPR.

**Table 2.1** **Percentage of EU-27 countries incorporating categories of measures from WFD Article 9(1) into their WPPs**

| | | Type of policy instrument | | | | |
|---|---|---|---|---|---|---|
| **Article 9(1) measure categorisation** | **Share of EU-27 Member States' WPPs with the measure** | **Regulatory** | **Market-based** | **Voluntary initiatives or agreements** | **Informative** | **EPR** |
| (a) Sustainable consumption models | 96% | 26% | 41% | 74% | 59% | 11% |
| (b) Encourage resource-efficiency, durability, reparability, reusability and upgradability | 89% | 11% | 15% | 78% | 37% | 15% |
| (c) Target products containing critical raw materials | 67% | 22% | 0% | 56% | 26% | 4% |
| (d) Encourage re-use and repair activities | 100% | 26% | 41% | 96% | 67% | 7% |
| (e) Encourage availability of spare parts, instruction manuals, technical information | 59% | 15% | 4% | 33% | 26% | 4% |
| (f) Reduce waste generation in processes related to industrial production, mineral extraction, manufacturing and construction | 93% | 33% | 30% | 70% | 37% | 0% |
| (g) Reduce the generation of food waste | 93% | 44% | 7% | 81% | 52% | 0% |
| (h) Encourage food donation and other redistribution | 78% | 15% | 15% | 59% | 22% | 0% |
| (i) Promote the reduction of the content of hazardous substances in materials and products | 59% | 22% | 4% | 44% | 19% | 4% |
| (j) Reduce the generation of waste not suitable for preparing for re-use or recycling | 70% | 15% | 15% | 44% | 22% | 11% |
| (k) Identify products that are the main sources of littering, take measures to prevent and reduce litter | 78% | 52% | 11% | 63% | 15% | 11% |
| (l) Aim to halt the generation of marine litter | 59% | 19% | 4% | 41% | 26% | 0% |
| (m) Develop and support information campaigns to raise awareness | 96% | 0% | 0% | 7% | 96% | 0% |

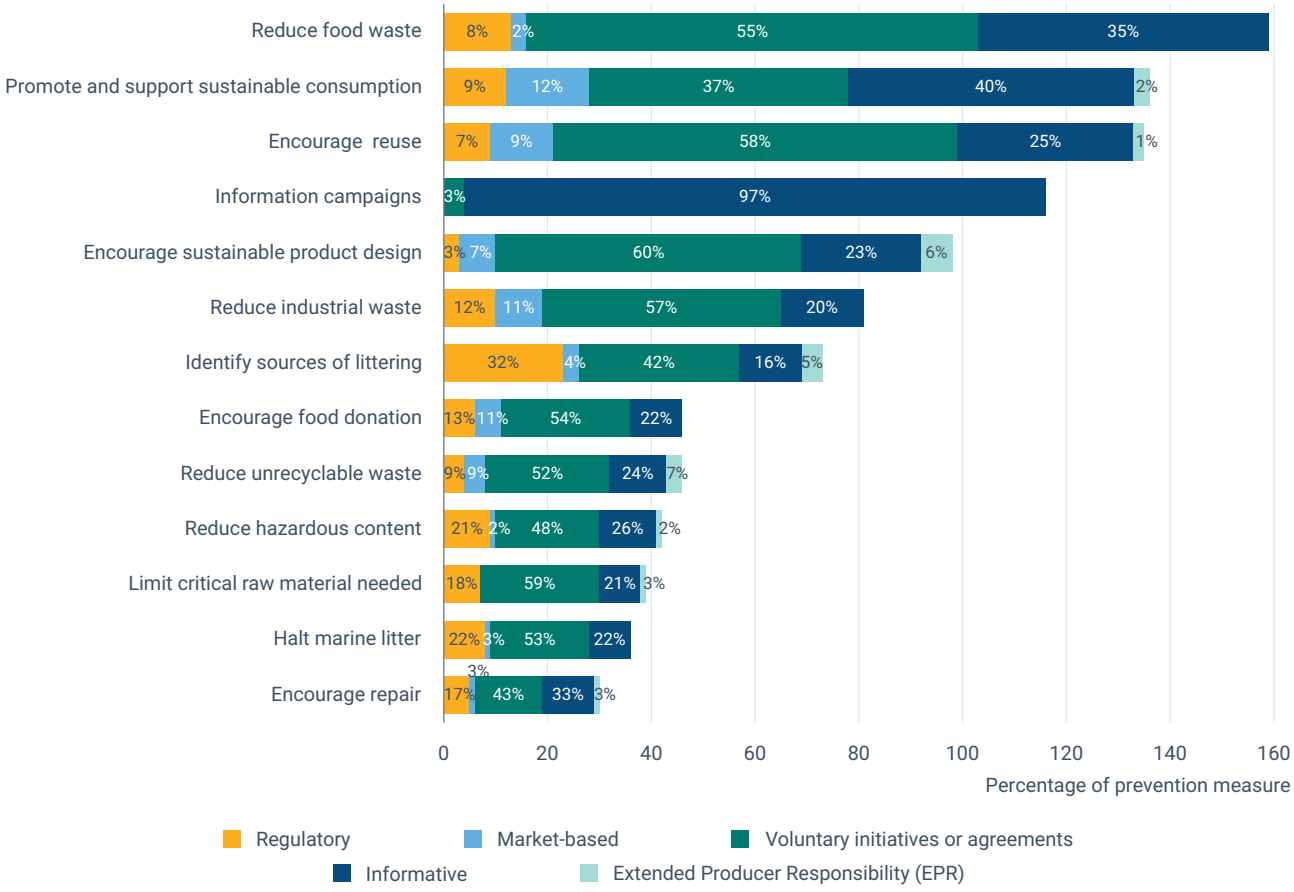
**Note:** Classification of the measures identified in each WPP according to the supporting policy instrument type.

**Sources:** WPPs of EU-27 Member States; EEA, 2025.

### *Voluntary initiatives or agreements are the most frequently-used policy instruments*

The top three WFD Article 9(1) measures most included in the WPPs of EU-27 countries are: 'Encourage reuse and repair activities' (all WPPs), followed by 'Sustainable consumption models' and 'Develop and support information campaigns to raise awareness'. Each of these measures is included in 96% of the WPPs. Together with 'Reduce the generation of food waste', these measures account for most policy instruments applied (see Figure 2.4).

**Figure 2.4** **Percentage of prevention measures per type of policy instrument and WFD Article 9(1) category for all EU-27 WPPs**




**Sources:** WPPs of EU-27 Member States, EEA, 2025.

Most Member States favour soft policy instruments, such as voluntary initiatives, agreements and informational campaigns. Of a total of 1,037 waste prevention measures identified in the EU-27 Member States' WPPs and categorised according to WFD Article 9(1), 46% implied the deployment of voluntary instruments and agreements while 35% represented informational instruments.

This is unsurprising as these instruments can be easily applied across a wide range of measures. However, while all WPPs include measures to encourage reuse and repair activities, the corresponding instruments are predominantly voluntary or informative. In contrast, regulatory and market-based instruments are employed in only 22% and 41% of Member States, respectively, or together in just 17% of total measures (see Annex 2 for further details).

The diversity of instrument types identified in each of the WPPs is presented in Table 2.2. The simultaneous deployment of instruments of a different nature and that reach out to different stakeholders is expected to contribute to the coverage and effectiveness of the proposed measures.

**Table 2.2 The diversity of policy instrument types in EU-27 Member States' WPPs**

| 5 types | 4 types | 3 types | 2 types | 1 type |
|---|---|---|---|---|
| 33% | 44% | 19% | 4% | 0% |

**Note:** Data indicate number of types per WPP.

**Sources:** WPPs of EU-27 countries; EEA, 2025.

All EU-27 Member States include at least two types of policy instruments in their WPPs. Nearly half of the EU-27 Member States use four different types and one-third utilise all available instrument types. However, only 41% of Member States have incorporated EPR-related instruments, while market-based instruments are absent from 22% of WPPs.

Of the Member States that use four types of instruments in their WPPs, all but one lack EPR-related instruments. WPPs with three types of instruments generally include voluntary and informative instruments, while typically excluding EPR-related instruments and either regulatory or market-based tools.

As of October 2024, only two Member States have WPPs without quantitative targets, while three lack monitoring indicators. Additionally, seven Member States have not updated or developed a new WPP after the expiration of their current programme; this has led to uncertainty about the validity of targets and indicators from previous programmes.

In some WPPs, quantitative targets are proposed without corresponding indicators to monitor progress, while in other cases, waste prevention indicators are in place without an associated quantitative target.

### *Food waste prevention in WPPs*

Insights on waste prevention policies — particularly targeting food waste — are shared in Chapter 3 of this report. The following paragraph summarises the WFD Article 9 measures that aim to reduce food waste.

Of the measures identified under Article 9(1), (g) and (h) which target food waste prevention as well as voluntary initiatives or agreements, are the most-proposed instrument types. Examples of these include governmental and non-governmental measures that focus on pilot projects or smaller scale projects on food donation, research or technical studies, as well as voluntary industry or public-private partnership agreements. These most-proposed instrument types are then followed by: informative instruments, such as communication campaigns and educational initiatives; then regulatory instruments, such as regulations and bans to divert food waste from landfill; and then market-based instruments, such as tax reductions for food donations and public procurement measures. Naturally, no EU Member State has EPR schemes specifically for food. Due to its perishable nature and the way the food supply works, such schemes are not possible.

More than half of the EU-27 Member States (56%) have included measures applicable to food waste prevention under WFD Article 9(1) paragraphs other than (g) and (h), which do not refer to food waste prevention exclusively. Especially informative measures often consider preventing food waste alongside other waste streams. More recently, since 2022, six Member States have proposed additional measures for initiatives developed in dedicated food WPPs.

10 Member States explicitly mentioned having quantitative food waste reduction targets in their WPPs. However, the recent European Topic Centre (ETC) report (ETC CE, 2025), further based on country questionnaires and the EU food loss and waste prevention hub, identified 22 countries that set food waste reduction targets (see Chapter 3 for further details). In total, 11 Member States have included dedicated indicators for monitoring food waste in their WPP. Regarding general waste prevention measures, in some cases, targets are linked to dedicated indicators, while in others, they are not.

With respect to the diversity of instrument types used in the WPPs (see also 'Policy enablers in the context of system and waste output in Annex 2), it can be observed that most Member States deploy at least two different types of policy instruments in their WPPs in support of measures that specifically aim to prevent food waste (Table 2.3). About one in five Member States uses all four different instrument types applicable to food waste, whereas 37% of the WPPs implement three types of instruments. As for general waste prevention, market-based instruments are scarcely used for food waste prevention; only seven Member States included a market-based instrument in primarily a single food waste prevention measure.

**Table 2.3** **The diversity of policy instrument types applied to food waste, that are included in EU-27 Member States' WPPs, by number of types per WPP**

| 4 types | 3 types | 2 types | 1 type |
|---|---|---|---|
| 19% | 37% | 33% | 7% |

**Note:** The sum does not equal 100% because one Member State did not propose any prevention measures; consequently, no associated policy instruments were included.

**Sources:** WPPs of EU-27 countries; EEA, 2025.

### *2.2.4 How waste depends on system context and policy enablers*

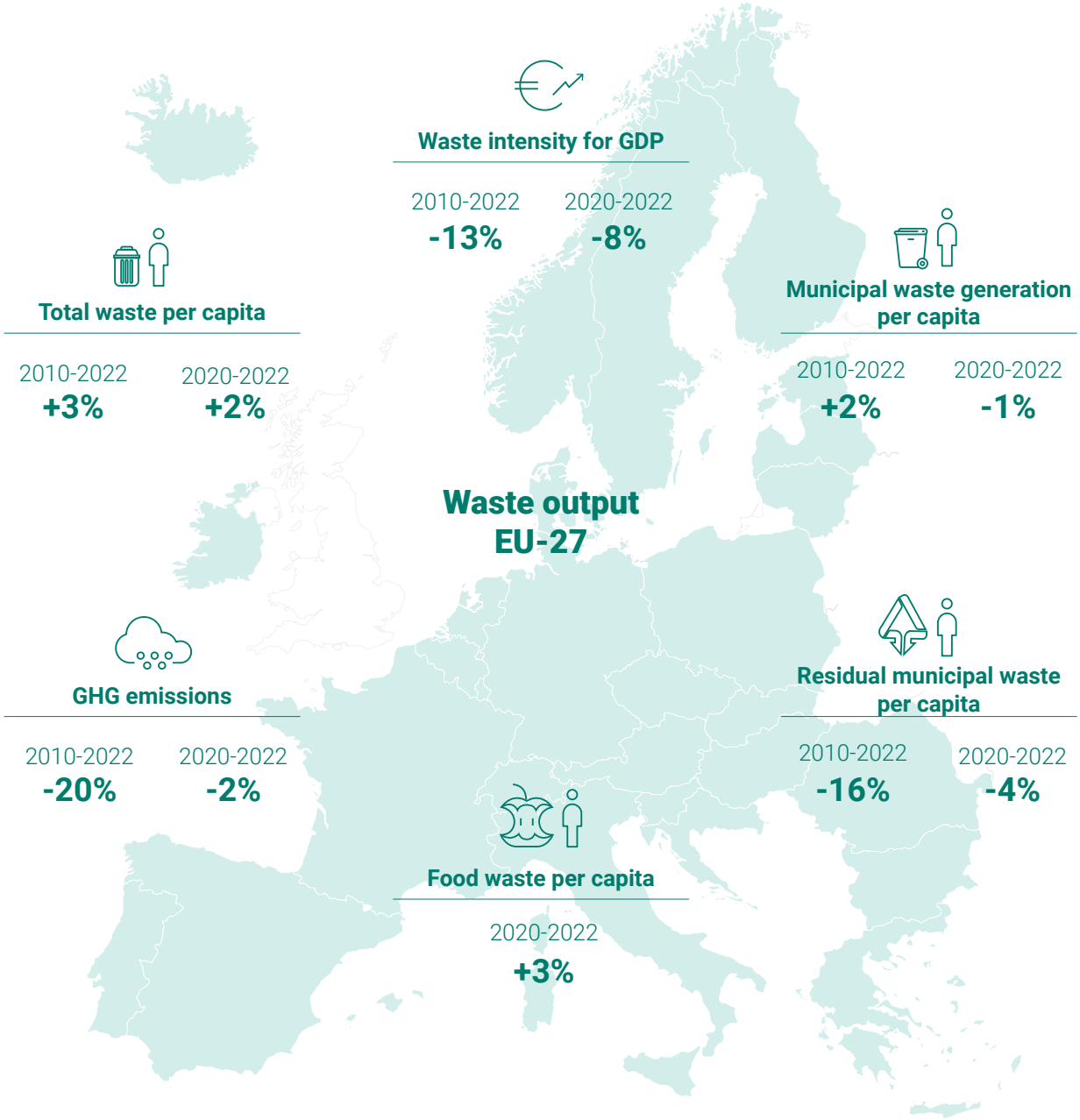
This section provides updated waste output indicators based on the latest available data and explores their dependence on system context and policy indicators. Detailed graphs and tables for each indicator, as well as an in-depth discussion of the connections between policy enablers and waste output can be found in Annex 2.

Total waste generation in the EU (excluding major mineral waste) continues to slightly rise, although waste intensity ([6]) relative to GDP is gradually declining, indicating modest decoupling. The COVID-19 pandemic impacted waste and consumption trends more than potential waste prevention measures. Since 2010, municipal waste generation has generally slightly increased, while residual waste has been decreasing due to reduced landfilling. Despite policy focus on reuse and repair and growth in the circular economy, recycling still far outweighs prevention

([6]) Waste intensity refers to the amount of waste generated per unit of economic output, typically expressed as kgs of waste per GDP EUR. It indicates the resource use efficiency and the decoupling of economic growth from waste generation.

activities like reuse. GHG emissions from waste management are steadily declining, primarily reflecting improving end-of-life management rather than waste prevention, although prevention efforts hold significant potential to mitigate climate impacts (see Figure 2.5).

**Figure 2.5** **Waste output indicators within EU-27**




**Source:** Author's compilation based on data from Eurostat in November 2024.

### *Total waste (excluding major mineral waste) generation continues to increase*

Waste statistics show a small but continuous increase in waste generation. In 2022, the EU-27 generated 795 million tonnes of total waste, excluding major mineral waste; this was equivalent to almost 1.8 tonnes per capita. Between 2010 and 2022, per capita waste generation increased by 57kg, a net rise of 3%. A temporary decline of approximately 5% (or -84kg per capita) occurred between 2018 and 2020, but waste generation rebounded in 2022 with a 2% rise (or 41kg per capita).

To better understand the changes in total waste generation, it is useful to break it down by its sources and the economic activities responsible. The main contributors to waste (excluding major mineral waste) in 2022 were the waste and water sector, households and manufacturing. These were followed by services and energy-related economic activities. Comparing 2010 to 2022, a notable shift can be observed: waste from manufacturing, energy, services, construction and others decreased (by 143kg per capita), while waste from the waste and water sector, households and agriculture increased (by 200kg per capita). The temporary decline in the total waste generation in 2020 was likely due to the COVID-19 pandemic and economic slowdown. During this period, the highest reduction in waste generation occurred in the energy sector (a decrease of 68kg per capita compared to the previous year), followed by manufacturing.

### *Waste intensity of net waste volume is decreasing, indicating modest decoupling*

From 2010 to 2022, waste intensity ([7]) (based on total waste excluding major mineral waste) decreased from 69kg to 60kg per EUR 1,000 of GDP, representing a 13% reduction. More recently, between 2020 and 2022, waste intensity fell from 65kg to 60kg per EUR 1,000 of GDP, indicating a decrease of 8%.

This trend suggests that waste generation has not kept pace with economic growth, possibly indicating relative decoupling ([8]). This could be attributed to waste prevention measures or other factors independent of waste-related policies, such as structural shifts in the economy. Examples of these include outsourcing industrial activities outside the EU and replacing waste-intensive activities with less waste-intensive ones — changes not necessarily driven by waste policies.

Decoupling is most apparent in manufacturing and, to a lesser extent, in services (Figure 2.6). Waste generation from both sectors declined in 2012 and remained stable until the COVID-19 pandemic, during which it underwent the most significant decrease of the last decade, thus highlighting the ongoing link between waste generation and economic growth. The 2012 decline may also be connected to the 2008-2009 economic crisis, as the economy was still recovering from its impacts, as discussed in Section 2.2.2.

It is likely that part of the decline in waste intensity has been driven more by economic shifts or other policies rather than by waste prevention measures. Notably, the energy sector was among the top three economic activities, with the largest reductions in waste generation occurring from 2010 to 2022 (see Table A2.3). This decline primarily stems from a reduction in combustion waste, which made up 75% of all energy sector waste in 2022, down from over 90% in 2010 (Eurostat, 2024l).

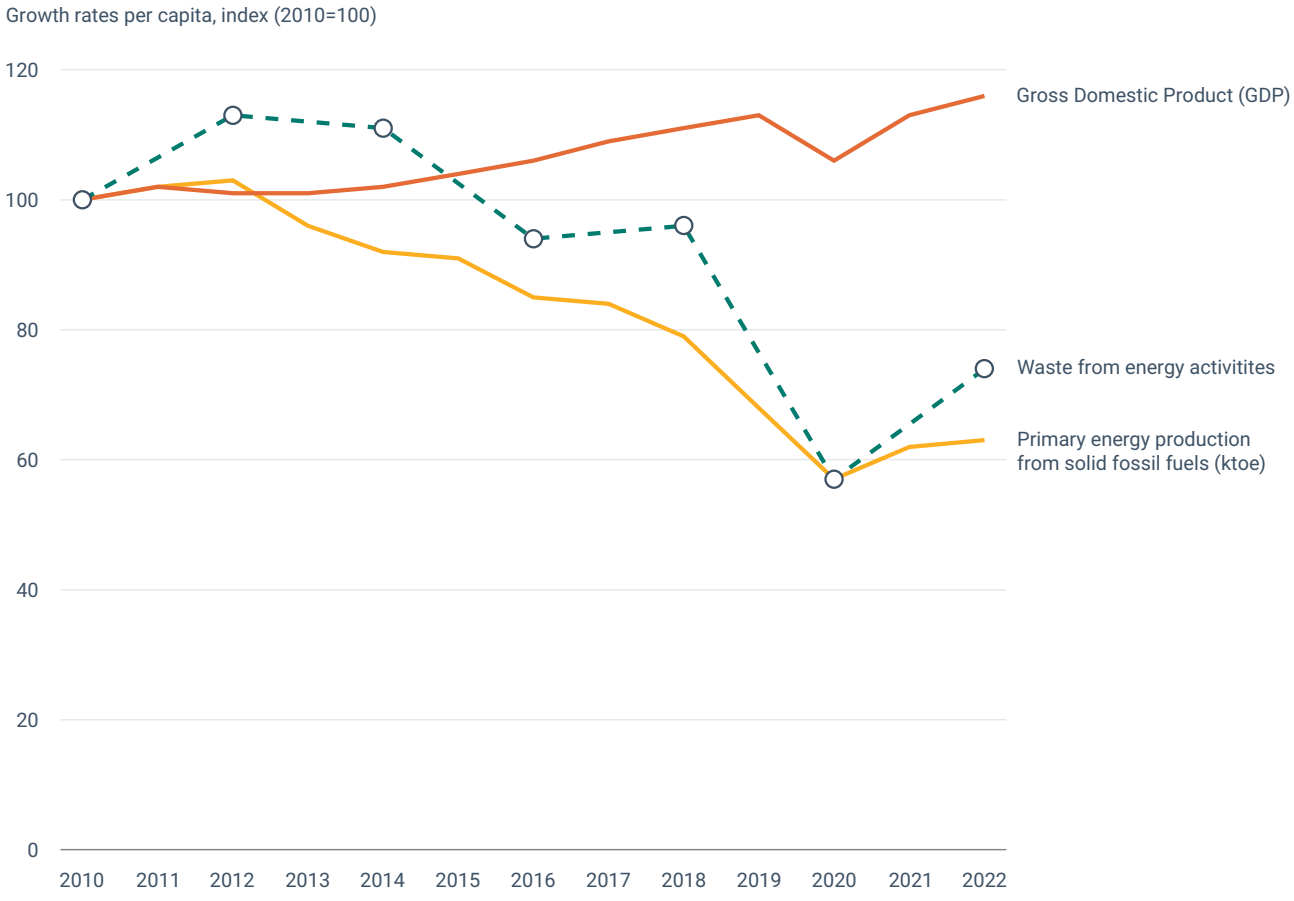
([7]) Waste intensity refers to the amount of waste generated per unit of economic output, typically expressed as kgs of waste per euro of GDP. It indicates the efficiency of resource use and the decoupling of economic growth from waste generation (see Annex 2 for further details).

([8]) Decoupling refers to the relationship between economic growth and waste generation. Absolute decoupling occurs when waste decreases despite economic growth; relative decoupling occurs when waste increases but at a slower pace than the economy, while no decoupling occurs when waste generation grows at the same or a faster rate than the economy (EEA, 2023b, 2021).

This decrease is likely linked to the reduced reliance on solid fossil fuels, which renewable energy sources have increasingly replaced over the past decade (Figure 2.6). This suggests that climate-related policy measures, rather than waste prevention initiatives, have had a more significant impact on this type of waste generation. However, a slight rise in fossil fuel use (and consequently combustion waste) was observed after 2020 (Eurostat, 2024d, 2024c), with industry and energy production recovering from the COVID low in 2020. The trends over the last decade are, however, stable and the 2022 values are still higher (GDP) or lower (waste and energy production) compared to the pre-COVID figures.

Despite reductions in some economic activities, waste from the water and waste management sector has risen significantly (Figure 2.7). Some of this increase may be linked to the expanded availability of wastewater treatment across the EU (EEA, 2024e). Additionally, secondary waste from pre-treatment processes, such as sorting residues and incineration ash, might contribute to waste in this sector. However, from a waste prevention perspective, this may lead to 'double counting' as it includes waste already recorded from manufacturing, services and households. Excluding secondary waste from the waste prevention indicator could address this issue, but the precise extent of this double counting was beyond the scope of this report.

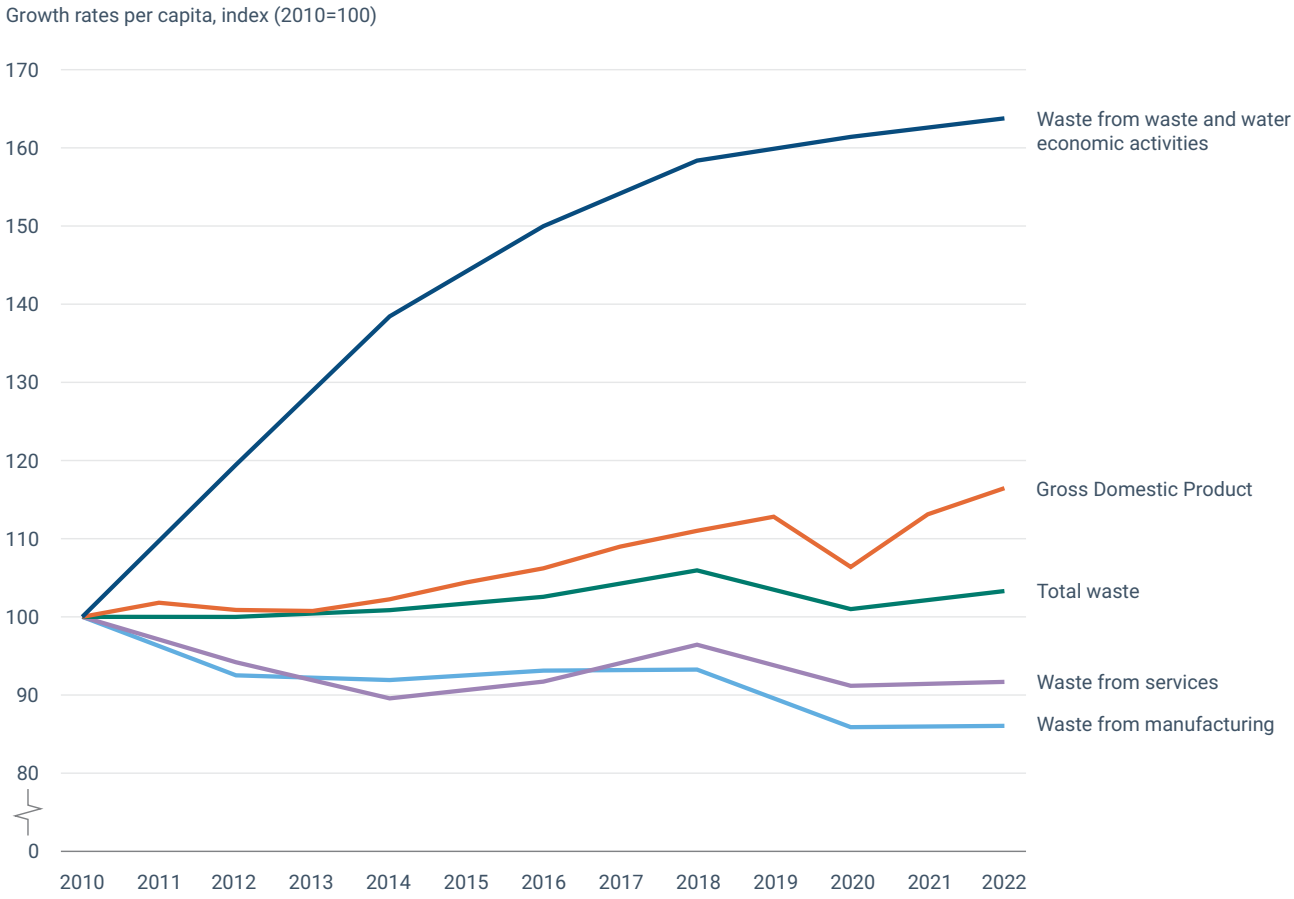
**Figure 2.6** **Waste from energy economic activities, primary energy production from solid fossil fuels and GDP per capita for the EU-27, 2010-2022, change indexed to 2010**




**Note:** Data for waste in the odd years are linearly extrapolated.

**Sources:** Author's compilation based on data from Eurostat, 2024d, 2024o, 2023b.

**Figure 2.7** **Total waste (excluding major mineral waste), waste from services, manufacturing, waste/water economic activities and GDP per capita for the EU-27, 2010-2022, change indexed to 2010**




**Note:** Data for waste in the odd years are linearly extrapolated.

**Sources:** Author's compilation based on data from Eurostat, 2024o, 2024l.

Overall, total waste generation continues to increase, albeit at a slower pace than GDP growth; this indicates a relative decoupling. While trends in waste generation vary by economic activity, further analysis is needed to fully understand the underlying drivers of these changes.

### *MSW generation continues to increase slightly in the long term, while residual municipal waste is decreasing*

In 2022, municipal waste generation in the EU reached 513kg per capita, a 2% increase from 503kg in 2010. Although there was a slight decrease (-1%) in 2022 compared to 2020, this change may reflect adaptations to the revised definitions and reporting rules under the WFD, as well as numerous effects of the COVID-19 pandemic. For instance, Belgium's expanded reporting to include non-household sources lead to a sharp rise from 416kg per capita in 2019 to 729kg in 2020, therefore breaking the time series (EEA, 2024h). Conversely, according to the new reporting rules, Sweden saw a decline from 449kg per capita in 2019 to 431kg in 2020, following the exclusion of household construction waste from municipal waste.

An auxiliary indicator based solely on household waste generation could be used to address the impact of changes in MSW reporting methodologies. Waste generated from household activities — excluding major mineral waste ([9]) — reported every two years and less affected by reporting changes, shows a similar 2% increase between 2010 and 2022. This aligns with the overall trend for municipal waste.

MSW generation varies significantly among Member States and these differences do not always indicate progress in waste prevention. Per capita municipal waste ranges from 303kg in Romania to 803kg in Austria ([10]) — a difference of 2.7 times. These disparities are largely influenced by variations in household consumption. In 2022, per capita expenditure on items most relevant to MSW generation — such as food and non-alcoholic beverages; clothing and footwear; furnishings; household equipment and routine maintenance; miscellaneous goods and services and spending on restaurants and hotels — ranged from EUR 3,440 to EUR 15,800 across the Member States. This reveals a difference of 4.6 times. Additional variation in MSW may result from different reporting or new definition practices, with some Member States potentially not yet including waste similar to household waste from non-household sources, as indicated by the EEA (EEA, 2024h). In countries with over 600kg of municipal waste per capita, household waste (as reported under the Waste Statistics Regulation No 2150/2002,(European Parliament and Council, 2002)) constitutes less than 75% of the total. In contrast, some countries seem to report only household waste in their municipal waste data (EEA, 2024h).

A continuous decrease in residual municipal waste can be observed, with the most significant decline occurring between 2010 and 2015 and a slower pace of reduction taking place from 2017 to 2022 (see Annex 2). This change is primarily due to a substantial decrease in landfilling (-60kg/capita), while incineration increased by 10kg per capita between 2010 and 2022.

Between 2010 and 2022, the total residual waste treated decreased significantly by 16%, while recycling increased by 31%. In the short term, from 2020 to 2022, a slight decrease was noted for the total MSW generated (-1%) and treated (-2%), with a more pronounced reduction in residual waste (-4%) compared to recycled amounts (-1%). This suggests a trend more strongly influenced by reductions in residual waste than by changes in recycling. These trends were also influenced by the fact that several countries started to more consistently deduct the rejects from the sorting of separately collected recyclables from the data reported for recycling. This was in response to the calculation rules for the WFD's recycling targets. Overall, potential changes in reporting and definitions, alongside the impact of COVID-19, mean that it is still challenging to draw firm conclusions on prevention trends.

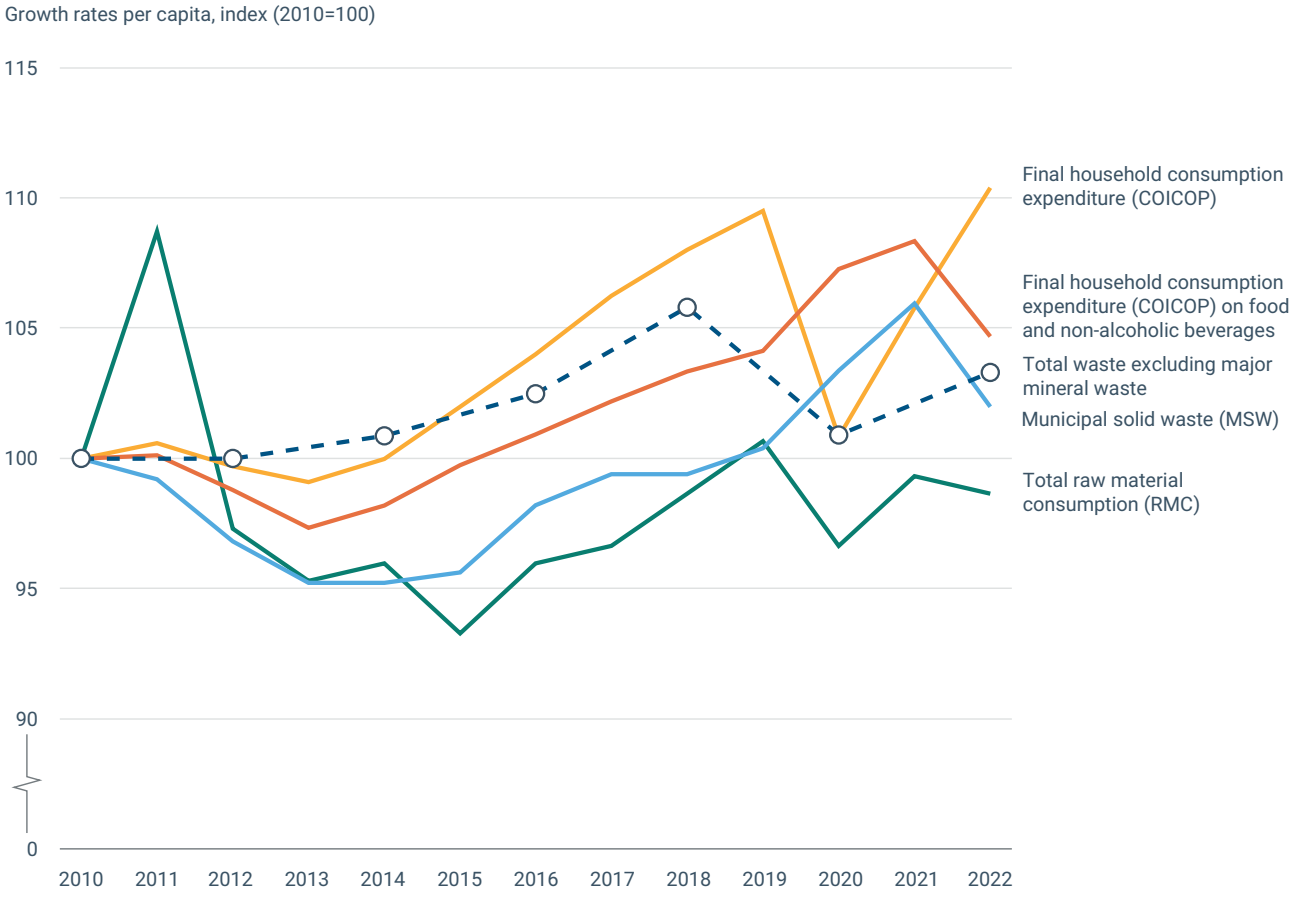
([9]) Unlike MSW, which includes waste from households and similar waste from businesses, public institutions etc., waste generation from household activities (as reported under the Waste Statistics Regulation No 2150/2002) focuses solely on waste generated by households. It also includes categories like construction and demolition waste and, in some cases, end-of-life vehicles etc., which are excluded from MSW (European Parliament and Council, 2002).

([10]) Municipal waste generation in Austria increased significantly from 2020 onwards, reflecting adaptations to the revised definitions and reporting rules under the WFD; this resulted in a break in the time series.

### *Waste and consumption*

Figure 2.8 presents changes indexed to 2010 in the indicators on waste generation in comparison with consumption indicators, namely household consumption expenditure and RMC.

**Figure 2.8** **Changes indexed to 2010 for Cluster 1 and Cluster 3 indicators: total waste (excluding major mineral waste), final household consumption expenditure (COICOP), final household consumption expenditure (COICOP) on food and non-alcoholic beverages, total RMC for the EU-27, 2010-2022**




**Note:** Data for total waste (excluding major mineral waste) in the odd years are linearly extrapolated.

**Sources:** Author's compilation based on data from Eurostat, 2024f, 2024l, 2024o, 2024q, 2024r, 2024p.

Two key trends can be observed. Firstly, since 2012, total waste generation (excluding major mineral waste) has closely followed trends in GDP, RMC and final household consumption expenditure. These indicators were significantly impacted by the COVID-19 pandemic and economic slowdown in 2020 but resumed growth in the post-pandemic period.

Secondly, municipal waste generation (including household waste, see Table A2.3) trends closely follow household spending on food and non-alcoholic beverages. This is because food forms a large portion of household expenditure and food and its packaging, due to their short lifespan, form a large portion of MSW, therefore leading to immediate waste in the same reporting year. During the COVID-19 pandemic, increased at-home eating drove up household food expenditures and likely generated additional packaging and food waste that would have otherwise been generated in restaurants or hotels. However, the latest MSW statistics should also account for waste from restaurants and hotels if they are similar to household waste. When focusing solely on household waste ([11]), a similar trend emerged during COVID-19: an increase in 2020 followed by a decrease in 2022. Lockdowns also prompted households to dispose of more bulky waste due to increased decluttering and private home renovations, as observed in Sweden (Swedish EPA, 2022).

These trends demonstrate that the COVID-19 pandemic and the associated economic slowdown had a more immediate and significant effect on consumption patterns and waste generation than any waste prevention measures implemented in the past decade. This highlights the persistent link between waste generation and economic activities, as well as the behavioural changes caused by lockdowns and shifts in daily life.

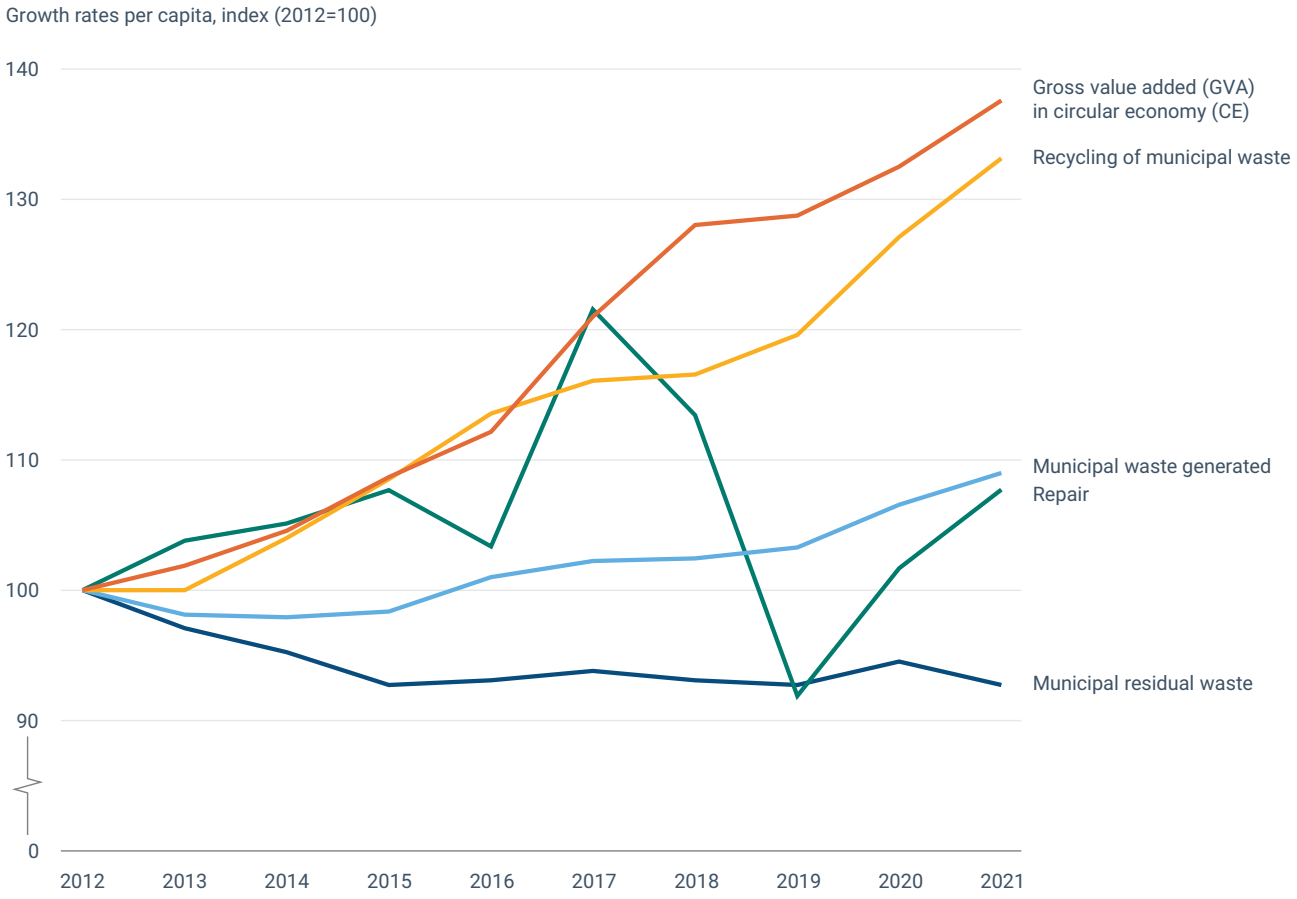
### *Reuse is outweighed by recycling*

In 2023, the first year of mandatory reporting under EU Implementing Decision (EU) 2021/19, Member States provided quantitative data on actual reuse, using 2021 as the reference year. Figure A2.11 presents the reported ranges for four categories: textiles, EEE, furniture and construction products and materials. Furniture and construction products show significantly wider ranges, indicating substantial variation in reuse practices and methodologies to collect reuse data across Member States. Textiles display more consistent values with less variation. Construction products have the highest average reuse (11kg per capita), while textiles have the lowest (2kg per capita), reflecting differences in the size and weight of products within each category (EEA, 2024h). However, the possibility for inter-country comparisons and other analyses are currently very limited due to the novelty of the reporting process and the associated uncertainties (EEA, 2024g).

To understand long-term trends in reuse as well as repair, connections with system context indicators, such as gross added value, can provide valuable insights. The indicator 'gross added value for the circular economy sector' includes reuse and repair — both relevant for prevention — alongside recycling, which is not directly linked to prevention. Additionally, as outlined in the previous chapters, time series data for repair post-2020 reflect substantial methodological changes, limiting comparability with earlier years. For this reason, these two indicators are assessed alongside other metrics (Eurostat, 2024q, 2024a, 2024e, 2024s), such as recycling and MSW generation, to provide a fuller view of repair and reuse, particularly in the context of waste generation. The added value in the circular economy sector has increased steadily, rising by 38% between 2012 and 2021; this is closely aligned with a 33% increase in MSW recycling over the same period. Repair activity also shows an upward trend from 2012 to 2021; however, these trends should be interpreted cautiously due to data collection changes since 2019. When considering only data from 2021-2022, repair activity shows an additional 5% increase in the total turnover or 4% when expressed as turnover per capita (Figure 2.9).

([11]) Waste generation from households, as reported under the Waste Statistics Regulation, was included in the analysis but is not shown in Figure 2.6 to maintain readability. This is because its trends closely mirror those of MSW.

**Figure 2.9** **Changes indexed to 2012 for Cluster 1 and Cluster 3 indicators: municipal waste, municipal waste recycling, residual municipal waste with GVA in the circular economy and turnover in the repair sectors, EU-27, 2012-2021**




**Notes:** Data are presented for 2012-2021 only and according to the time series of repair/CE sector indicator data. Changes in waste generation and recycling indicators are based on waste volumes, while changes in repair and reuse indicators are based on financial units.

**Sources:** Author's compilation based on data from Eurostat, 2024a, 2024e, 2024s, 2024q.

In 2021, the average per capita MSW generation was 532kg, with approximately half this amount (265kg/capita) being recycled. Early data on reuse in 2021, though limited, reveal significant variation across the 20-21 Member States that reported reuse levels; figures reveal an average of 13kg per capita across categories relevant to MSW — textiles, EEE and furniture — ranging up to 56kg per capita (EEA, 2024f). While data on reuse levels are far from robust, even at the maximum reported levels, they remain considerably lower than per capita recycling.

Policies addressing repair and reuse are among the most prioritised by Member States in their WPPs. The WFD Article 9(d) policy measure 'Encouraging reuse and repair' is the most widely-covered in WPPs; all programmes include this measure. It is also one of the four measures where the majority of policy instruments are applied; these are predominantly soft measures, which account for 83% of this measure group (see Annex 2 for further details).

Despite the increased policy focus on prevention and the overall growth in added value for circular economy activities, recycling significantly outweighs prevention activities such as reuse.

### *Substances of very high concern in products placed on the market (based on the SCIP database) — indicator should be revised in the future*

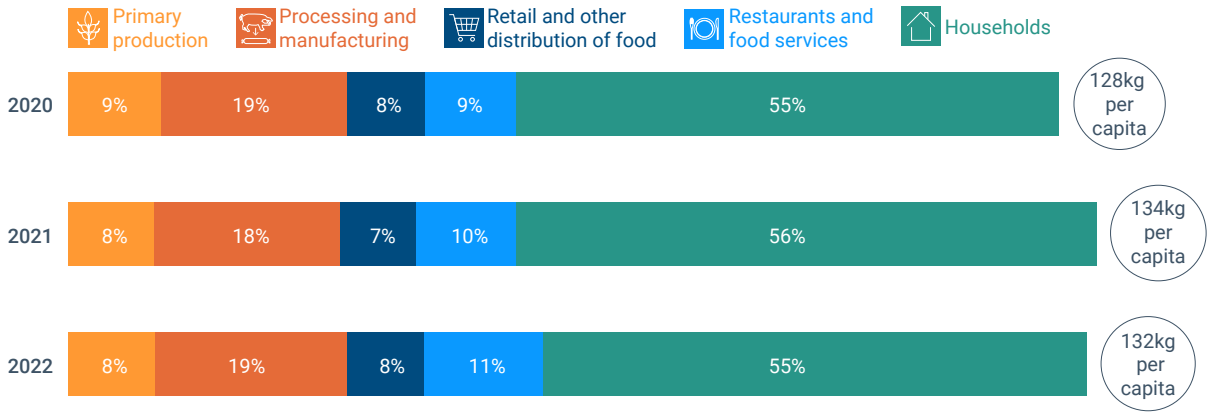
The indicator is available from SCIP ([12]) but is not included for this evaluation year. The data from the SCIP database on substances of very high concern in products placed on the market are of a similar quality to that of 2023, reflecting the total weight of hazardous substances used in production processes and products. These data are difficult to interpret since the weights of all substances are combined into a single figure. Consequently, a decision was made not to assess these data for this evaluation, but instead to consider revising the indicator in the future.

### *Households are the biggest contributors to food waste*

In 2022, approximately 132kg ([13]) of food waste per inhabitant was generated in the EU (see Figure 2.9). This figure was slightly higher than in 2020 and marginally lower than in 2021 (Eurostat, 2024j). These variations are likely due to differences in reporting practices (see Chapter 3 for details) and the impact of COVID-19 rather than major actual changes. In the third year of reporting, some countries submitted data for the first time, while others revised previous data (Eurostat, 2024i). Countries that reported consistently over all three years show a stable trend in their reported data of food waste generation per capita (Eurostat, 2024i).

Slight year-to-year fluctuations in food waste data by the different stages of the value chain are observed; these likely due to changes in reporting methods (see Chapter 3 for details) and the impact of COVID-19. Households remain the largest source of food waste, contributing 55-56% of total food waste; this is followed by manufacturing (18-19%), primary production (8-9%), restaurants and services (9-11%) and retail (7-8%) (Figure 2.10).

**Figure 2.10 Food waste 2020-2022 in percentage and kg per capita within EU-27**




**Source:** Author's compilation based on data from Eurostat, 2024j.

([12]) SCIP stands for Substances of Concern in Articles or Complex Objects (Products). It is a database created by the European Chemicals Agency (ECHA) as part of the EU WFD.

([13]) The report is based on data available from Eurostat up to November 2024. At the time of its release, newer data were published — 128kg/capita (January 2025). This was due to the inclusion of Romania in the dataset.

Comparisons can be drawn by examining changes in food waste generation in households and restaurants alongside specific household expenditures, using disaggregated indicators from Cluster 1 — system context. When indexed to 2020, changes in waste generation closely reflect expenditure patterns in related areas, such as household spending on food and non-alcoholic beverages and on restaurants and hotels (Figure A2.12). This alignment suggests that the observed shifts are likely linked to the impact of COVID-19. In the post-COVID period, households eat out more frequently, leading to increased waste generation in restaurants and food services and reduced household food waste.

When interpreting these first food waste statistics, it is important to remember that Member States are still refining their methodologies. To support Eurostat in identifying outliers, the Joint Research Centre (JRC) recently published updated results from its food waste model (JRC, 2024a), which uses official production and trade statistics, retail sales data and food waste coefficients to estimate waste across the EU supply chain. For 2021, the model's estimates were higher than the country data reported to Eurostat, with the largest discrepancies indicated in primary production and the smallest at the household level (JRC, 2024b). This suggests that household food waste data are likely more consistent and less impacted by methodological changes compared to data from primary production. Further details are provided in Chapter 3.

Food waste generation alone does not provide a clear picture of prevention efforts and its potential, as a portion of food waste is inevitable due to inedible parts (such as vegetable peel or bones). A more informative indicator would be the share of edible food waste within the total food waste. According to a recent ETC report (ETC CE, 2025), edible waste can constitute up to half of total food waste in some countries, as suggested by the literature. This therefore indicates that there is significant potential for prevention. However, reporting on the share of edible waste to Eurostat is voluntary and statistics are not publicly available, limiting its use in monitoring prevention efforts.

Member States have shown increased policy focus on food waste prevention, with the WFD Article 9(g) measure 'Reducing the generation of food waste' being one of the most widely covered in WPPs. It is also the leading measure in terms of the number of policy instruments applied within the Article 9(1) measures (see Annex 2 for further details).

This increased attention to food waste prevention is likely driven by a stronger focus at the EU level, prompted by new reporting requirements and the proposed food waste reduction targets outlined in the revision of the WFD. The most effective approach would be to analyse the effects of specific measures or policy instruments at the national level. However, according to a recent ETC report (ETC CE, 2025), it seems that no EU country is currently conducting a comprehensive assessment of the effectiveness of food waste prevention policy measures.

([14]) The indicator includes only specific treatment types: landfilling, incineration without energy recovery and biological treatment. See Annex 2 for more details.

### *Steady decline in waste management GHG emissions: prevention key to mitigating climate impact*

GHG emissions from the waste sector ([14]) in the EU-27 fell from 137 million tonnes in 2010 to 110 million tonnes in 2022. This was a 20% reduction, including a 2% drop between 2020 and 2022. This decline mainly reflects reduced emissions from landfilling linked to improved end-of-life practices rather than a decrease in waste generation. Between 2010 and 2022, emissions from biological treatment rose by 50%, with a 6% increase from 2020 to 2022. This was driven by increased recycling of biodegradable waste, including emissions from waste composting and anaerobic digestion. Emissions from waste incineration (without energy recovery) decreased by 13% over the same period (2010-2022), from 4.1 to 3.6 million tonnes. These figures exclude waste-to-energy facilities, whose emissions are reported under the 'Energy' sector. In contrast, waste treatment with energy recovery has grown by 49% since 2010 (Eurostat, 2024u).

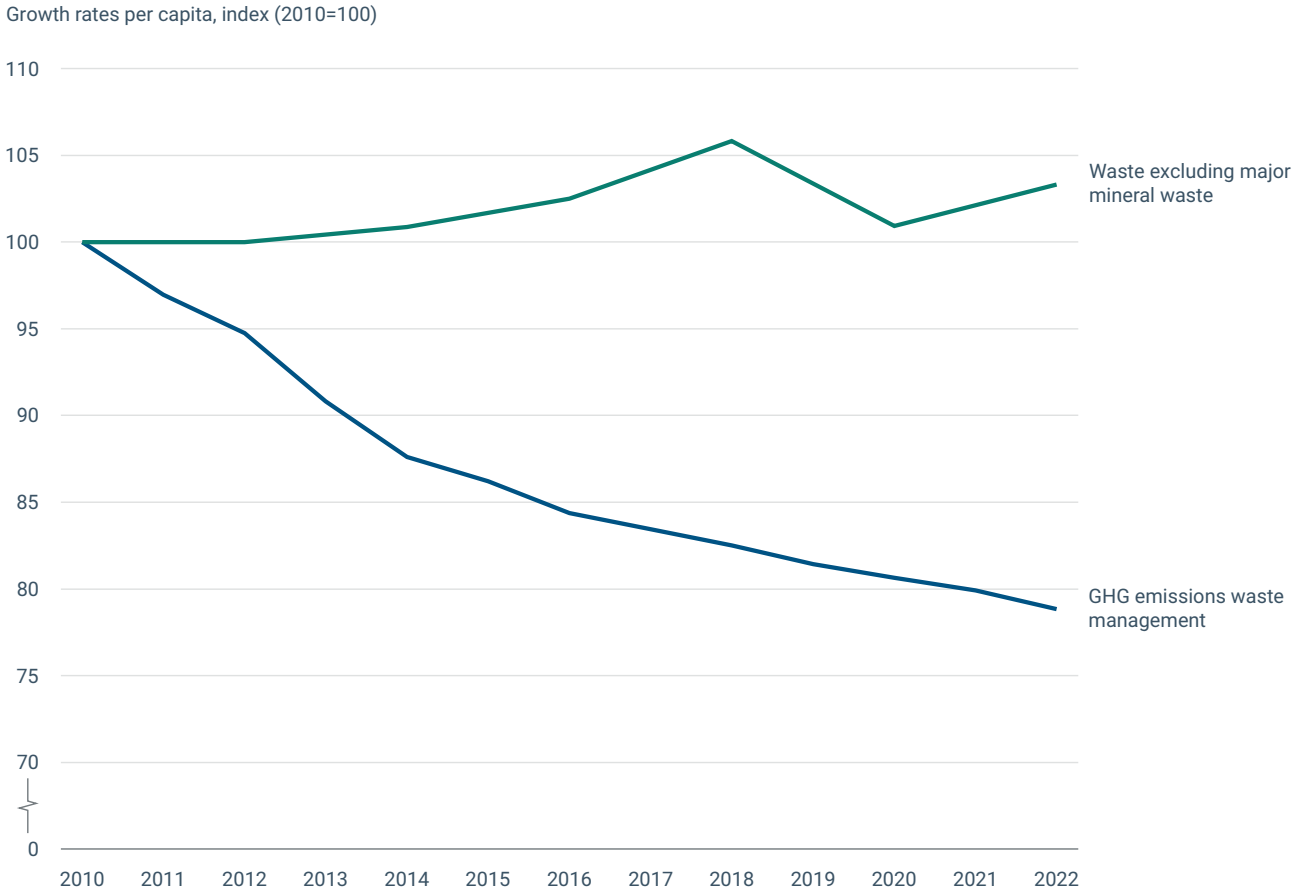
In pursuit of a climate-neutral economy, the EU Climate Law (European Parliament and Council, 2021) sets ambitious GHG reduction targets: a 55% net reduction below 1990 levels by 2030 and climate neutrality by 2050, thus aligning with EU commitments under the International Paris Climate Agreement (UNFCCC, 2015). Specifically, these targets encompass all GHG emissions within the EU. In 2022, GHG emissions from waste management reached 109.7Mt$CO_2$e, representing a small share (3%) of total EU-27 GHG emissions (EEA, 2024b). Notably, GHG emissions from waste-to-energy activities are reported in the energy sector rather than in the waste sector. Even when waste is incinerated with energy recovery, it would not constitute waste prevention.

The observed decline in GHG emissions from waste treatment is mainly attributed to reduced landfilling of biodegradable waste, technical measures at landfills and a shift toward energy and material recovery rather than a decrease in waste generated (Figure 2.11). There has been a transition from landfilling toward higher levels of the waste hierarchy, indicating progress in waste management strategies (Figure 2.12).

However, this shift has yet to reach the level of waste prevention. It must be emphasised that waste prevention remains the most effective approach for improving resource efficiency and reducing the environmental impact associated with waste generation. For instance, achieving the proposed food waste reduction targets detailed in the WFD revision (10% for processing and manufacturing, 30% for retail and consumption by 2030) could potentially lead to a net reduction of -9.9Mt$CO_2$e and even up to -62Mt$CO_2$e if the avoided emissions are included (JRC, 2023a), or alternatively, 9-57% of total GHG emissions from waste management. Beyond food waste, the prevention of other waste streams such as waste from electrical and electronic equipment (WEEE), textiles, fossil-based materials (e.g., plastics and tires) and residual waste, could also significantly reduce GHG emissions per unit of waste.

A Swedish case study on household waste prevention demonstrates that redirecting all mixed waste to recycling could triple reductions of GHG emissions; however, focusing on waste prevention could potentially increase benefits twenty-sevenfold, especially for waste streams like WEEE, food and textiles (Miliute-Plepiene and Sundqvist, 2024). Strategies sometimes suggested within the context of circularity, such as refuse, rethink, reduce, retain, reuse, share and repair, are also highly relevant in the context of waste prevention and play an important role in mitigating climate impact, as demonstrated by the EEA (EEA, 2024b).

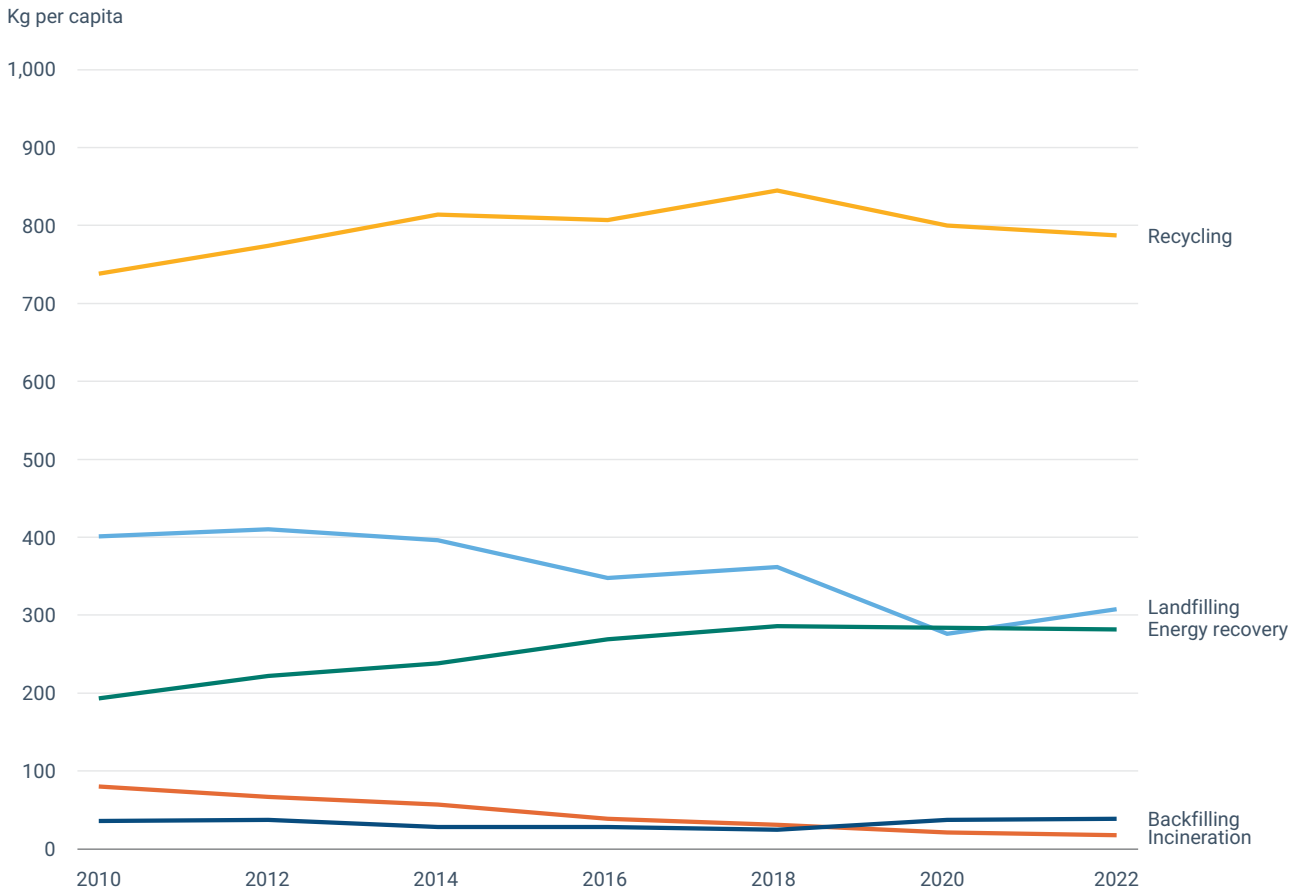
**Figure 2.11** **Change indexed to the year 2010 for total waste (excluding major mineral waste) and GHG from waste management for the EU-27, 2010-2022**




**Note:** Data for total waste (excluding major mineral waste) in the odd years are linearly extrapolated.

**Sources:** Author's compilation based on data from Eurostat, 2024l, 2024n.

**Figure 2.12** **Total waste in kg per capita (excluding major mineral waste) by waste treatment type for the EU-27, 2010-2022**




**Note:** Incineration without energy recovery.

**Source:** Author's compilation based on data from Eurostat, 2023b.

## 2.3 Potential improvements and remaining limitations in the monitoring framework

Some methodological changes to the framework previously suggested by the EEA (2023b) — such as the disaggregation of total waste, the revision of final consumption expenditures and adjustments to the residual waste indicator — have been tested. However, certain identified limitations persist, particularly those related to policy enablers.

Disaggregating total waste (excluding major mineral waste) has proven highly valuable in understanding trends and identifying the sectors driving change. This approach allows for a clearer analysis of the causes behind waste generation. To further enhance the framework, continued exploration of the drivers behind increases in waste from the water and waste and other sectors is recommended.

Additional sector-specific system context indicators may be needed to provide deeper insights. For example, value added from reuse, repair and recycling is a good indicator for circular economy; however, to track the progress of waste prevention, the repair and reuse sectors would have to be disaggregated from the indicator. There is no data collection at the EU level that would solely focus on the waste prevention sector, despite it being the priority option in the waste hierarchy. This is because it includes measures before a substance, material or product has become a waste.

The indicator framework excludes major mineral waste. This is due to the total waste including a large proportion of mineral waste, which, despite its substantial share, is generally inert and poses fewer environmental risks. However, this also results in the exclusion of a significant portion of mineral waste from the construction sector, some of which could potentially be prevented (for example, tiles or roof tiles for reuse) and in substantial quantities. Further work could explore whether and how this waste stream should be considered.

The revision of final household consumption expenditures, which includes transport and fuel expenditures indirectly linked to waste generation, was also examined. When focusing solely on categories relevant to MSW generation — such as food and non-alcoholic beverages; clothing and footwear; furnishings; household equipment and maintenance; miscellaneous goods and services as well as expenditure on restaurants and hotels — the trends closely mirror those of the total final consumption. However, these expenditures are not immediately reflected in MSW statistics. This is likely due to definitional and reporting discrepancies in recent years, as noted in the previous chapter. There is also a time lag associated with the discarding of durable goods. Items like textiles, footwear, furnishings and miscellaneous goods contribute to MSW only when eventually discarded. This means that their impact on waste statistics appears months or years later than the expenditure. Therefore, while this indicator may serve as a supplementary to the indexed total final expenditures and while household spending on food and non-alcoholic beverages may serve as the same to the total final expenditures, household spending on food and non-alcoholic beverages remains a more direct predictor of MSW generation. For this reason, it is recommended for continued use in future monitoring efforts.

The residual waste indicator was also previously recommended for revision due to its limited relevance for waste prevention (EEA, 2023b). However, it may still provide valuable insights in the future due to its connections with other targets; this is particularly the case for the MSW recycling and preparation-for-reuse targets set by the WFD, as well as the (non-binding) circular economy action plan ambition to 'halve the amount of residual municipal waste by 2030'. According to

the EEA (EEA, 2024h, 2022), achieving the latter target will require going beyond full implementation of the established preparation for reuse and recycling targets for MSW; it will also necessitate addressing the prevention of non-recyclable MSW.

While the framework and evaluation identify trends and explore underlying potential factors, the data do not clearly link waste prevention measures to waste output trends. A key challenge lies in the widely-differing formats and content of national programmes, along with broadly defined or pre-existing measures, which make their impact difficult to assess. Additionally, there is limited information on the actual implementation of these programmes.

While Member States are required to evaluate their WPPs every six years, this requirement is often inconsistently met, evaluations are not always publicly available, and the effectiveness of policy instruments remains insufficiently assessed. It is possible that the mandatory adoption and use of common objectives and tools to facilitate their implementation, along with a harmonised set of indicators to assess effectiveness across Member States, could help to address these inconsistencies. Additionally, ensuring mandatory publication of evaluations could enhance transparency and accountability, contributing to a more robust and coherent waste prevention framework across the EU.

To enhance the monitoring framework for waste prevention, it is essential to assess not only the effectiveness of the measures but also their efficiency. This can be achieved by evaluating how well specific measures utilise allocated resources to achieve the intended outcomes. In the future, the monitoring framework would benefit from incorporating indicators like budget allocations for waste prevention efforts in Member States. However, obtaining such data at the national level and correlating them with outcomes may be challenging.

# 3 Preventing food waste in Europe

**Key messages**

- Climate change, biodiversity loss and food waste are deeply interconnected challenges. Reducing food waste lowers greenhouse gas emissions and alleviates pressure on ecosystems. However, food waste prevention measures are insufficiently integrated into biodiversity and climate strategies, missing opportunities for synergies.
- Food waste prevention is gaining momentum across the EU-27, with 15 Member States implementing dedicated strategies beyond legal requirements. The majority have set food waste reduction targets, and 15 Member States explicitly commit to Sustainable Development Goal's Target 12.3 in their national waste prevention plans. However, efforts are mainly focused on awareness-raising and education (62%), while market-based measures (4%) and regulatory interventions (1%) remain limited.
- Reliable data are essential for tracking progress and developing effective, evidence-based, national food waste prevention policies. While there is still room for improving data collection, mandatory reporting of food waste generation in the EU is leading to increasingly better data. This supports Member States in meeting the new EU food waste reduction targets.
- Platforms such as the EU Platform on Food Losses and Food Waste and Eionet can facilitate knowledge exchange, the sharing of good practices and capacity-building in food waste monitoring and data collection. Increased collaboration could also help with aligning efforts where reliable measurement methods are still under development, particularly in distinguishing between edible and non-edible food waste as well as tracking surplus food donations.
- Member States should follow guidance from the 'food use hierarchy' while being aware of the interconnectedness within its different levels. While some food waste treatment will always be necessary as not all food waste is avoidable, the priority should consistently be for higher-value use. For instance, surplus food should be clearly prioritised for food donation organisations or be transformed into animal feed instead of, for example, being recycled. This approach ensures resource efficiency and supports recycling targets while prioritising environmental and ethical outcomes.

## 3.1 Introduction and scope

### *3.1.1 Context*

The primary role of the food system is to meet the essential human need for nourishment. In a sustainable food system, the economy and consumer culture must be shaped to limit natural resource use and keep it within planetary boundaries, while also supporting ecosystem health and enhancing social well-being. In Europe, the food system is a significant component of its production and consumption framework, responsible for more than 22% of environmental and climate impacts (EEA, 2024c).

Wasting food means that all the resources needed for its production, such as soil, water and energy, are also wasted (EEA, 2024a). Additionally, it means that the environmental burden of food production — such as the high input of chemical pesticides required to ensure stable food output and efficient production — is even more problematic, as these harmful impacts on soil, water and air occur without the food ever being used or valued ([15]). Food waste has a huge environmental impact, accounting for about 16% of the total GHG emissions from the EU food system (EC, 2024a). Furthermore, uneaten food contributes to the serious threat to biodiversity. Agriculture, driven by unsustainable food production practices, remains the leading cause of biodiversity loss, endangering around 24,000 species (UNEP, 2024).

Preventing food waste is therefore both urgent and necessary — not only to combat climate change but also to protect biodiversity, reduce pollution and enhance food security.

The EU has established a comprehensive framework to address food waste in alignment with the sustainable development goal (SDG) Target 12.3 (U.N., 2015). It aims to halve per capita global food waste at retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses by 2030. Since the 2015 circular economy action plan was introduced, the EU has focused on developing a common waste measurement methodology, facilitating food donations and improving date marking (EC, 2015).

The WFD, as amended in 2018, requires Member States to implement specific food WPPs (EU, 2018). The farm to fork strategy, initiated in 2020, further prioritises food waste prevention (EC, 2020). Institutional initiatives, such as the EU platform on food losses and food waste and the EU food loss and waste prevention hub help Member States and businesses achieve their objectives. Furthermore, consultative processes like the European citizens' panel on food waste engage the public in discussions on food waste prevention. Together, these policies demonstrate the EU's support of the 'target-measure-act' approach advocated by Champions 12.3 ([16]), encouraging Member States to set measurable targets, monitor food waste data and implement concrete actions.

To support these efforts, the WFD obliges EU Member States to measure and report food waste. 2020 was the first mandatory reference year for reporting. This process, which includes submitting a quality report, has improved monitoring systems within countries and enhanced the information base for national and EU-wide food waste prevention initiatives.

([15]) In 2019, 83% of agricultural soils was found to contain residues from pesticides (Silva et al., 2019) and in 2022, 9-25% of all surface water monitoring across Europe contained pesticides above the effect thresholds (EEA, 2024d). Moreover, approximately 23% of Europe's seas have a eutrophication problem, with nitrate pollution from industrial farming being a primary cause (EEA, 2019).

([16]) A high-level coalition of executives from governments, business, research, international organisations, civil society and farmer groups committed to inspiring ambition, mobilising action and accelerating progress towards achieving SDG Target 12.3 (Goodwin et al., 2022).

Despite these efforts, food waste remains a major challenge across the EU, with an average of 132kg ([17]) of food wasted per person annually, amounting to just over 59 million tonnes in 2022 (see Figure 2.9). Individual countries report food waste ranging from 71kg to 294kg per person per year. In the supply and consumption sectors — excluding production and processing stages — food waste generation is estimated to account for approximately 10% of the food placed on the EU market (Eurostat, 2024i).

To accelerate progress, the European Commission (EC) has proposed binding food waste reduction targets to be achieved by the EU-27 Member States by 2030: a 10% reduction in processing and manufacturing and a 30% per capita reduction at retail and consumer levels. On February 18, 2025, the Council and the European Parliament reached a provisional agreement in trilogue negotiations on these targets. They are designed to assign clear responsibility to Member States, encouraging them to accelerate food waste reduction throughout the food supply chain and in households. The goal is to make a meaningful contribution toward achieving SDG Target 12.3 and to enable a strong, consistent engagement by all Member States to reduce food waste, aligning their efforts with those of front-runners (EC, 2023).

To achieve these targets, effective national food waste prevention policies and implementation pathways accounting for regional disparities will be needed. This includes a better understanding of food waste amounts as well as insights into the causes and effects of food waste and its reduction in specific stages, as well as across the food supply chain as a whole. For the coming years, Member States also have the opportunity and need to enhance their measurement processes to obtain more accurate data.

Through these actions, the EU aims to foster a unified approach to food waste prevention while allowing Member States the flexibility to address specific challenges and contexts.

### *3.1.2 Objectives of this chapter*

This chapter aims to:

- present findings on food waste prevention and reduction actions ([18]) in the EU-27 Member States;
- share insights into how the reporting process of gathered food waste data by the EU-27 and Norway can still be improved to facilitate future evaluation of progress; and
- deepen understanding of food measuring efforts and challenges in the EU-27.

([17]) Note that at the time of the release of this report, newer data were published by Eurostat — 128kg/capita (January 2025) — due to the inclusion of Romania in the dataset.

([18]) Here, an 'action' is defined as an initiative or a policy-related work with the objective of concretely preventing or reducing food waste, carried out within an EU-27 Member State (ETC CE, 2025).

## 3.2 Implementation status of food waste prevention in the EU-27

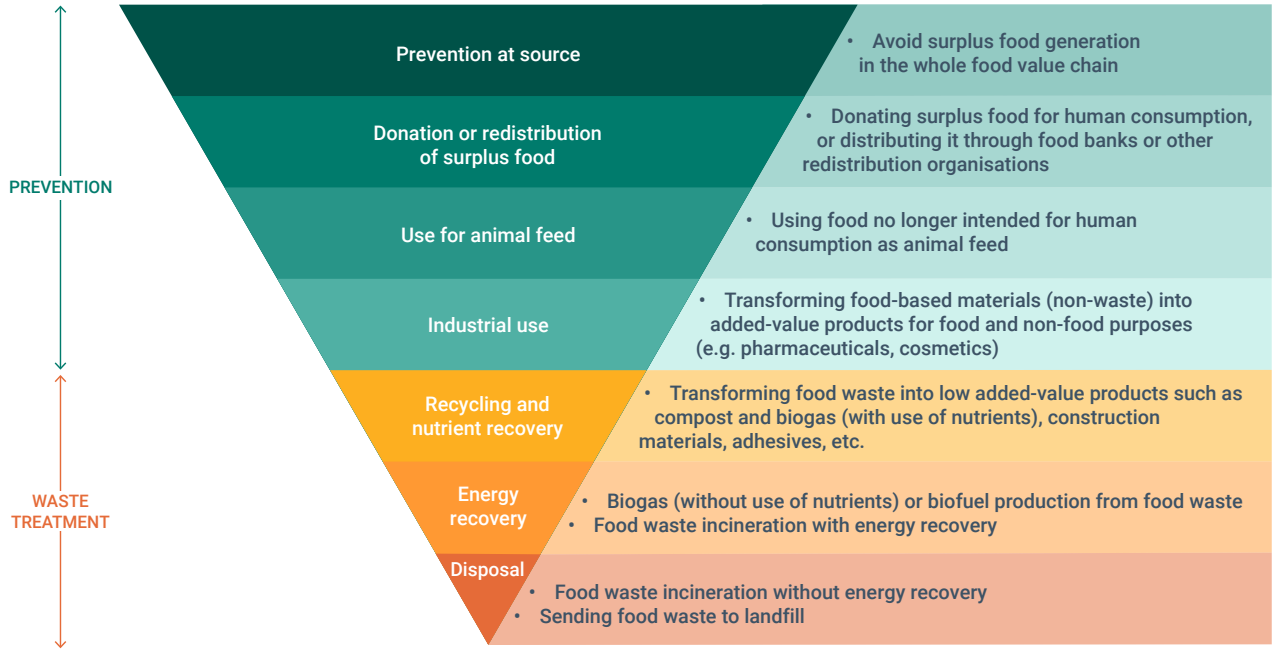
### *3.2.1 Data reviewed*

This chapter builds upon a review conducted in 2023 by the ETC on Circular Economy and Resource Use (ETC CE), which examined food waste policies and prevention actions across the EU-27 Member States. The review drew on data collected through questionnaires sent to Eionet ([19]) members, as well as information from countries' waste prevention profiles and the EU food loss and waste prevention hub. This information was used to analyse and map how Member States prioritise actions according to the higher levels of the 'food use hierarchy' (ETC CE, 2025).

### *3.2.2 EU support for food waste prevention over waste management*

In accordance with SDG Target 12.3, EU Member States are obliged by the revised EU WFD (EU, 2018) to develop specific food WPPs which contribute to the reduction of food waste at each stage of the food supply chain. As outlined by the WFD (EC, 2008), priority is to be given to preventing waste and to encourage the donation or redistribution of food for human consumption over animal feed and other uses. To better address the unique aspects of food and provide appropriate guidance, the 'waste hierarchy' has been adapted to the 'food waste hierarchy' and then, more recently, to the 'food use hierarchy'. This is to emphasise the 'uses' of food before it becomes waste (JRC, 2020; De Laurentiis et al., 2024) (see Figure 3.1). The food use hierarchy thereby considers both environmental and ethical aspects.

**Figure 3.1 Hierarchy for the prioritisation of options to manage food surplus, by-products from food processing and food waste — 2024 update to the food use hierarchy**




**Notes:** In this 2024 update to the food use hierarchy, descriptions have been clarified in comparison to the earlier version from 2020 (JRC, 2020) in order to support Member States and other stakeholders and help define the distinction between 'prevention' and 'waste treatment'.

**Source:** De Laurentiis et al., 2024.

([19]) The European Environment Information and Observation Network (Eionet) is a partnership network of the EEA and its 38 member and cooperating countries. The EEA and Eionet gather and develop data, knowledge and advice to policymakers about Europe's environment. For more information see: https://www.eionet.europa.eu.

### *3.2.3 How the EU-27 Member States are tackling food waste*

Country information from 2023 provides evidence of the ongoing efforts to fight food waste and shows the willingness of Member States to prioritise actions towards the higher levels of the 'food use hierarchy' — namely prevention at source and donation or redistribution of surplus food (ETC CE, 2025):

- Most of the EU-27 Member States (15 in total) have implemented or are in the process of developing dedicated food waste strategies, action plans, or pacts in addition to legally required food WPPs. Moreover, 22 ([20]) of the 26 Member States that provided information have established food waste reduction targets, while 15 countries have explicitly committed to SDG Target 12.3 in their national waste plans or programmes.

- The EU-27 Member States and Norway are making significant progress to develop their monitoring systems and methodologies to collect food waste data (for more detail, please see subchapter 3.3.).

- An analysis of 332 food waste actions ([21]) by the EU-27 Member States shows that 93% are targeted at the highest level of the 'food use hierarchy' (see also Figure 3.1). Specifically:

- 66% of actions focus on preventing food waste at source.

- 26% aim to donate or redistribute surplus food for human consumption.

- 1% is dedicated to using surplus food or side steams from food production for animal feed.

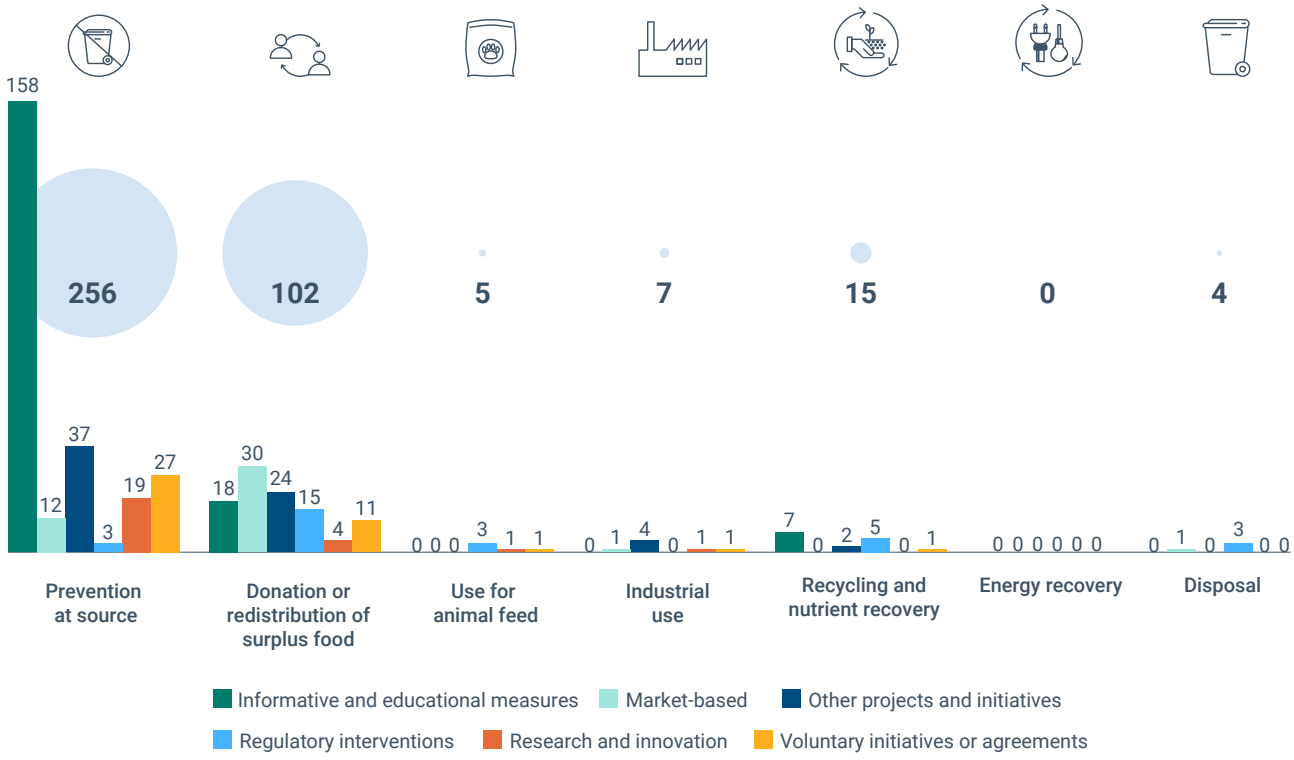
- The remaining 7% of actions address the lower levels of the 'food use hierarchy' which deal with food waste treatment, such as the use of food waste for biogas production.

For prevention at source, countries mainly use 'soft' policy measures. Of the respective actions reviewed, 62% were informative and educational measures (such as nationwide campaigns or engaging social media initiatives), 14% were other projects and initiatives (including inspections at retailers, hosting platforms for stakeholder exchange and dialogue or the introduction of doggy bags, for example), 11% were voluntary initiatives or agreements and 7% were research and innovation actions (such as investigations of potential unfair trading practices or the application of artificial intelligences to prevent crop diseases). Figure 3.2 presents further details of the share of action types (ETC CE, 2025).

([20]) This number is higher than the 10 Member States mentioned in Chapter 2. This is due to the data sources used in addition to the waste prevention profiles, namely country questionnaires and information collected from the EU food loss and waste prevention hub.

([21]) An 'action' defined an initiative or a policy-related work carried out within an EU-27 Member State with the objective of concretely preventing or reducing food waste. These actions were then classified according to type of policy measures to address food waste and then with regards to the approaches suggested by the food use hierarchy (ETC CE, 2025).

**Figure 3.2 Number of actions by type and level of the 'food use hierarchy'**




**Notes:** Compilation based on information retrieved from the EU food losses and food waste (FLW) prevention hub and Eionet questionnaires. Number of actions reviewed by levels of the 'food use hierarchy' and respective shares of action types. Wording updated to reflect clarified descriptions outlined in the 2024 update of the 'food use hierarchy' (De Laurentiis et al., 2024).

**Source:** ETC CE, 2025.

In addition to these insights, the 2023 mapping also revealed that:

- None of the EU-27 Member States have mentioned any results from evaluations assessing the effectiveness of their food waste prevention actions, either on the Member State pages of the EU FLW prevention hub or in their questionnaires ([22]).
- Only a few EU-27 Member States currently link their food waste actions to biodiversity and climate change strategies. While eight Member States considered food waste in their national climate plans and three partially address it, only two explicitly mention food waste in their biodiversity strategies. Others refer more broadly to food in general. Most countries have yet to establish connections between food waste and other policy areas.

([22]) A JRC study noted that five countries (Sweden, Netherlands, Austria, France and Germany) seem to have at least established the awareness if not the capacity for evaluation, together with a more transparent dissemination of monitoring and evaluation efforts (De Laurentiis, V. et al., 2023).

### 3.3 General findings on food waste reporting and measurement

The following review focuses on both the submission of data to Eurostat and the initial collection and compilation of mandatory and voluntary food waste data within the countries. It aims to identify major trends and challenges with food waste reporting and measuring across Member States at a meta level.

## Box 3.1

**EU reporting obligations**

- The WFD, revised in 2018 (EU, 2018), establishes an annual reporting obligation on food waste generation. The aim is to monitor and assess the implementation of food waste prevention actions in Member States.
- For uniform measurement, a common methodology is outlined in EU Delegated Decision (EU) 2019/1597/EC. This decision provides a range of possible data collection methods as minimum quality requirements for the Member State responsible for the original data collection. The methodology requires annual reporting of the amount of food waste generated in a full calendar year, also using estimates. In addition, an in-depth analysis of food waste levels at each food supply chain stage is required at least once every four years.
- Further data on food waste levels and food waste prevention may be provided to the EC, in accordance with Article 3 of the above-mentioned decision dedicated to voluntary measurement.
- EU Implementing Decision (EU) 2019/2000 establishes the reporting format.
- Together with food waste data, Member States must deliver a quality report (Eurostat, 2024b) focused on the methodologies used for the collection and compilation of mandatory and voluntary data. It also requests information on any changes and problems encountered. The aim is to verify reported data and improve measurement methods as well as to ensure comparability of those methods.
- The quality assurance and associated documentation is a joint responsibility of Eurostat and the Member States.

**Guidance to Member States**

- Eurostat has issued a guidance document for the reporting of the food waste data in accordance with EU Delegated Decision (EU) 2019/1597/EC (Eurostat, 2022).

**Data validation by Eurostat**

- Eurostat collects and verifies data submitted by EU Member States, performing checks to ensure consistency, plausibility and alignment with trends over time. It also analyses the methodology used to gather the data, as outlined in the quality report. If discrepancies or unclear methodologies are identified, Member States may be asked to provide further explanations or clarifications.

**Sources:** Eurostat, 2022, 2024k.

### 3.3.1 Data reviewed

The data and information reviewed in Chapter 3.3. are primarily sourced from the quality reports submitted by EU Member States and Norway to Eurostat, which accompany their food waste data for 2020 and 2021. These reports have generally not been published. However, in some cases, the published data have been flagged as 'definition differs'; in these cases, Eurostat publishes short explanations in the metadata to the dataset (Eurostat, 2024k).

The findings presented here primarily focus on the mandatory in-depth measurements (outlined in Annex III of the delegated decision, which details the methodology for measuring food waste) conducted for the reference year 2020. Where relevant, insights related to food waste calculations (using the alternative methodology described in Annex IV) or data from 2021 are also included.

Free text entries were mapped and categorised. To identify specifics, the information shared by a country regarding each individual value chain stage is considered and presented in the following as so-called 'datasets'.

## Box 3.2

**Methodologies for food waste data collection**

- EU Delegated Decision (EU) 2019/1597/EC requires in-depth measurement of food waste in each stage of the value chain (at least once) every four years using the methodology set out in Annex III 'Methodology for the in-depth measurement of food waste'. Member States have the flexibility to choose from or combine the methods, which include direct measurements or approximations of food waste, such as weight or volume measurements; waste compositional analysis; mass balance; questionnaires and interviews; and scanning or counting, as well as diaries.
- For the years between instances of detailed measurement, Annex IV 'Methodology for the measurement of food waste where an in-depth measurement in accordance with the methodology set out in Annex III is not used' offers an additional list of methods that a Member State can use to calculate food waste generation. Member States are asked to ensure that this happens based on the best information available.

**Source:** Eurostat, 2022.

### 3.3.2 Food waste measurement approaches and data sources (2020-2022)

The first mandatory year for food waste reporting, 2020, coincided with the onset of the COVID-19 pandemic. Despite this challenge, most of the reporting EU Member States, plus Norway, managed to use in-depth measurements. Specifically, 87% of datasets referred to only in-depth measurement, while an additional 6% used both — in-depth measurement and estimation.

In terms of country overviews, this translates into 19 of the 26 reporting countries applying only in-depth measurement for the reference year 2020; one country using estimations for all value chain stages based on in-depth measurement data obtained for the year 2018, while two countries used estimations for individual value chain stages. Both in-depth measurement and estimations were used by one country for all value chain stages and by another three countries for one or two value chain stages.

Countries largely relied on sources other than those already collected for EU waste statistics. The majority used multiple data sources for their in-depth measurements, with 45% of the reported datasets in 2020 coming from such sources and 29% resulting from dedicated studies such as scientific or consultancy reports. This contrasts with 26% being derived from data collected specifically for EU waste statistics (EU Regulation (EU) 2150/2002/EC) (see Figure 3.3). This distribution of data sources remained similar in 2021, with 43% resulting from multiple sources, 25% from EU waste statistics and 32% from dedicated studies.

Notably, in 2021, 10 Member States continued to use in-depth measurement for all stages while another 10 Member States did so for at least several value chain stages. In consequence, 65% of the datasets exclusively relied on in-depth measurements, while the remainder either switched to calculations (21%) or built upon both approaches simultaneously (14%). Primary production and household stages continued to be mainly covered by in-depth measurements (73-74%) compared to calculations (14% and 9%, respectively).

Eurostat observed that several countries improved their measurement methods from 2020 to 2021 and again from 2021 to 2022 (Eurostat, 2024i).

### *3.3.3 Diverse approaches to measuring food waste across the supply chain*

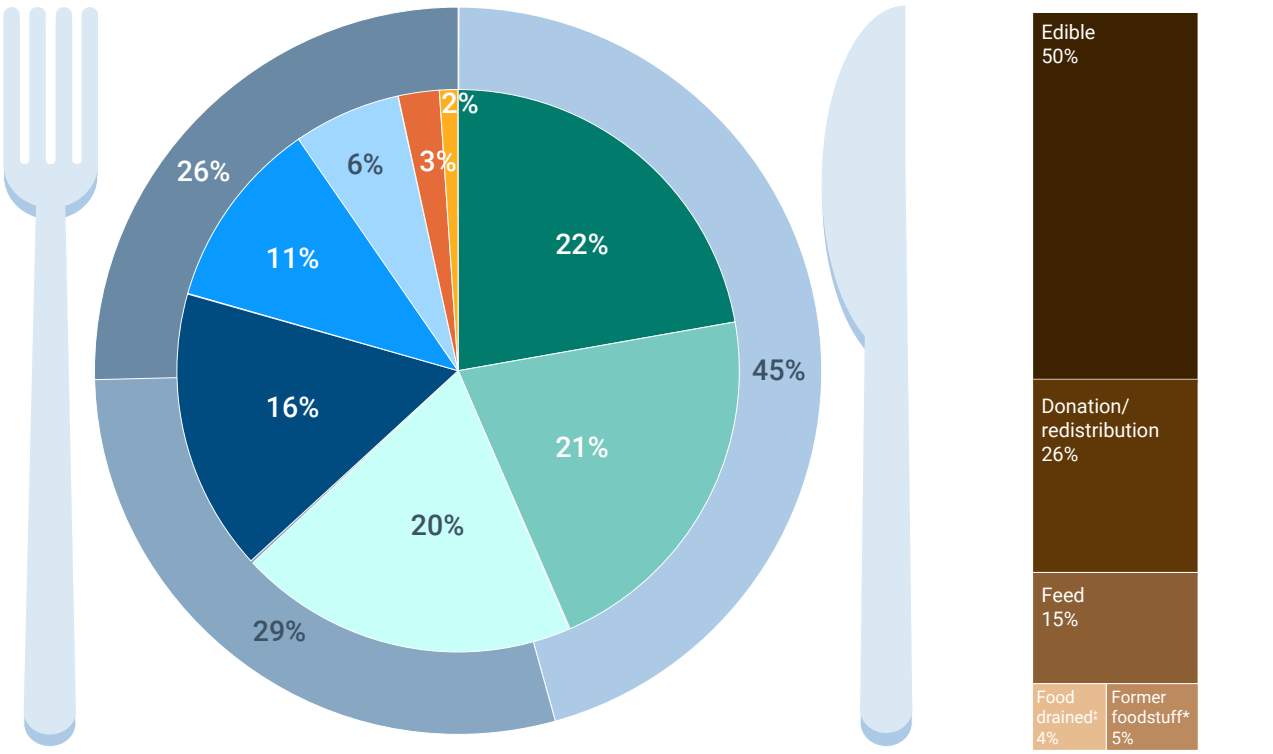
Member States can use different methods to measure food waste in depth across different stages of the supply chain. Most countries except for two used varying methods for each stage.

In 2020, the most used in-depth measurement methods were coefficients ([23]), questionnaires and direct measurement (see Figure 3.3). For 2021, the pattern remained similar, although there was a slight decrease in the use of questionnaires and interviews (14%) and a slight increase in waste composition analysis (16%). This shift may reflect improved measurement and data collection conditions due to fewer COVID-19 restrictions, though further investigation will be needed to confirm this when examining measurement methods applied for the reference years 2022 and 2023.

Countries did not limit themselves to the methods suggested particularly for each value chain stage in Annex III of the delegated decision. Instead, they employed a combination of additional or alternative methods (see highlights overview in Figure 3.5). This possibility was foreseen by the delegated decision in cases when direct access to food waste or direct measurement was not feasible or if the method was considered equivalent in terms of relevance, representativeness and reliability. For instance, some countries also used questionnaires and interviews, or applied coefficients for retail and distribution, restaurants and food services, and households; scanning and counting for processing and manufacturing; mass balance for restaurants and food services, as well as diaries for retail and distribution. The use of these methods, originally non-specified particularly for these stages, may have been influenced by the practical challenges of measurement and data collection during the COVID-19 pandemic. This will be better understood once data from less impacted reference years become available.

([23]) According to the delegated decision, food waste coefficients or sector-specific percentages can be used, established via sampling or other methods with data from food businesses.
Some countries were vague in their quality report on applying coefficients, while others were clearer. Examples include:
(1) Using a 40% food waste percentage for supermarket residual waste and sector-wide ratios for auctions and wholesale, applied to 2020 waste data.
(2) Applying a 0.239 coefficient for food waste in mixed municipal waste and 0.14 for biodegradable waste.

**Figure 3.3** **EU-27 reporting and measurement for the reference year 2020: used data sources, used in-depth measurement methods and type of reported voluntary data. Presented in percentage of overall reported datasets per individual value chains stages**




**Notes:** The outer 'plate' represents sources used. The inner 'dish' presents the measurement methods used within direct measurement. The 'napkin' to the side shows the type of data shared by those countries that provided voluntary data. All data are shown in percentages.

**Source:** Author's compilation based on quality reports for the reference year 2020.

#### *Methodological uncertainties experienced during in-depth measurements*

Following the request in the quality report to describe any main issues affecting the accuracy of the data, including errors, countries reported a total of 180 major issues for 2020 and 106 for 2021. The challenges varied across different value chain stages.

The COVID-19 pandemic was cited 16 times in 2020 and seven times in 2021 as a factor affecting data quality. In 2020, it had the most significant impact on the restaurant and food services stage (eight mentions), as well as on retail and households (three mentions each).

In many cases, the error sections across various value chain stages in the quality reports were incomplete. In 2020, 14% of these sections lacked information — a notable issue during the first year of mandatory reporting, which coincided with the onset of the COVID-19 pandemic. Given these circumstances, some measurement challenges during this period were expected.

#### *Methods for estimating food waste*

When in-depth measurements are not used, countries can estimate food waste. This can be based on the latest available data on food waste share (for the given year, or if not available, for the previous year) at different stages of the supply chain and the total waste generation data collected under the Waste Statistics Regulation. Alternatively, it can be based on socioeconomic data relevant to those stages. A combination of both methods is also possible.

In 2020, 7% of countries used calculations based on Annex IV methodologies to estimate food waste. This number slightly increased to 21% by 2021. Among these countries, most relied primarily upon socioeconomic indicators, with 77% using them in 2020 and 79% doing so in 2021. While no countries combined both calculation and in-depth measurement methods in 2020, 10% did so in 2021.

In 2020, calculations using socioeconomic indicators were applied mainly to primary production, retail and other food distribution as well as restaurants and food services. Estimations based on the share of total waste generation were then only applied to processing and manufacturing, as well as households.

By 2021, the use of these methods became more diverse (see Figure A3.1).

### *3.3.4 Voluntary food waste data reporting: insights and coverage*

In addition to the mandatory food waste data, Member States have the option to voluntarily report additional information on food waste levels and prevention. These voluntary data are particularly valuable for food waste types where reliable measurement methods are still under development.

Reporting additional evidence on food waste increases data confidence and comparability, offering valuable insights across several areas. Data on edible food waste help improve our understanding of potential prevention strategies. Information on food donation assesses the effectiveness of donation policies, while data on food waste in wastewater reveal the extent of unacknowledged food waste. Additionally, reporting on food used for animal feed enlightens discussions on EU law reforms

aimed at better valorising food waste ([24]) and provides a clearer picture of material flows, which can inform targeted food waste prevention policies.

In 2020, 13 countries reported voluntary data, resulting in a total of 74 datasets. These data covered various stages of the food supply chain, with 100% of participating countries including the household sector and 58% of them covering primary production. In 2021, the number of countries providing voluntary data decreased to 11, producing a total of 50 datasets.

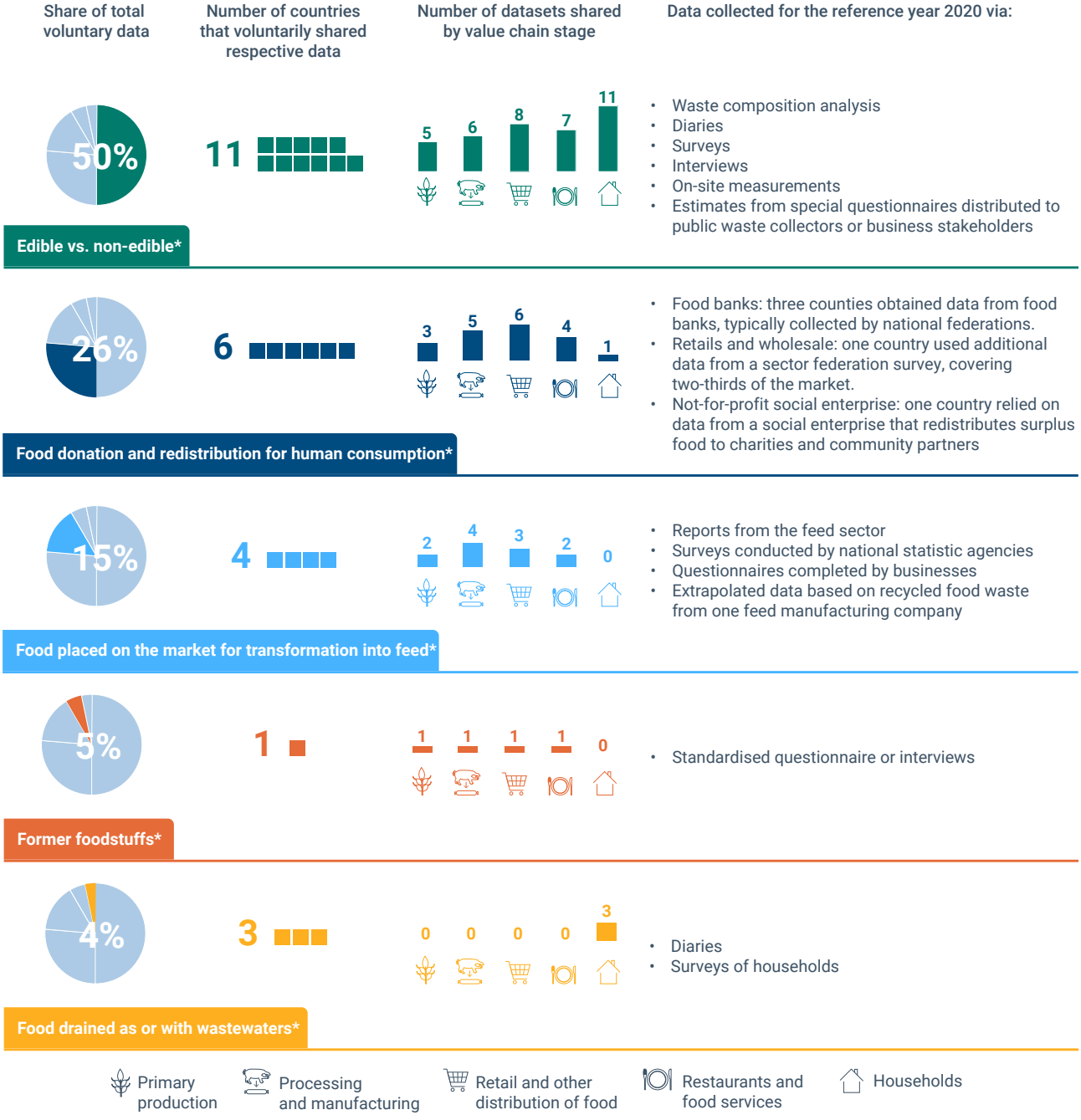
Of the voluntary data, in 2020, 50% related to edible and non-edible food waste, while 26% focused on food donation and redistribution for human consumption. In both categories, data were shared for each stage of the value chain. 15% of the shared datasets concerned amounts of food no longer intended for human consumption which were placed on the market for transformation into feed by a feed business. Less frequently covered was food waste disposed of through wastewater, representing 4% of datasets and covering only the household stage. Former foodstuffs were also covered less often, represented by 5% of datasets, covering all stages except households.

Examining voluntary data coverage across value chain stages reveals that information on edible and non-edible waste was most often shared at the household stage (11 datasets). For food donation and redistribution, retail and other distribution of food provided the most data (six datasets) compared to other stages. Data on food transformed into feed were most available at the processing and manufacturing stage (four datasets). Lastly, data on former foodstuffs were each shared by one country for four different value chain stages.

Additional details, including examples of how countries collected this data, are shown in Figure 3.4 for an illustrated comparison.

([24]) This concerns, for example, the suggestion to EU regulations in order to permit safe methods for utilising catering waste as feed for non-ruminants (Agora Agriculture, 2024).

**Figure 3.4** **Voluntary data shared for the reference year 2020: number of countries sharing voluntary data in total by type of voluntary data, number of datasets received per value chain stage and examples of measurement methods applied**




* Article 3 Commission Delegated Decision (EU) 2019/1597 of 3 May 2019

**Source:** Author's compilation based on quality reports for the reference year 2020.

## 3.4 Food waste measuring and reporting in different stages of the value chain

### *3.4.1 Primary food production*

Primary production accounted for 9% (equalling 12kg) of food waste generation per capita in 2020. This decreased to 8% (11kg) in 2021 and 8% (10kg) in 2022 (Eurostat, 2024h) ([25]).

#### *Measuring and reporting*

- Half of the in-depth food waste data collected for primary production in 2020 came from 'other sources' or a 'combination of different sources'. Two countries expressed having partly used the JRC food waste model for their own calculations, specifically for crop production and to capture the share of primary production not covered by other methods applied.

- In-depth measurements appeared to be most feasible when using questionnaires and diaries, applying coefficients and conducting direct measurements.

#### *Methodological uncertainties and challenges*

Due to the definition of food waste in the EU WFD 2008/98/EC, pre-harvest losses are currently not included in the scope of EU food waste measurement. Sometimes, this creates practical difficulties to differentiate harvested food from production left on the field, or being recycled in other sectors via composting or biogas production, for instance with regards to the respective coefficients (see also Table 3.1).

The rate of processing errors in data for primary production is the highest across the value chain, at 30%. Challenges were particularly evident with family farms, including a low response rate (sometimes addressed through individual phone interviews) and the potential for double counting of household food waste and family farm waste. Despite requests for farms to only measure food waste from production, these issues persisted.

A few countries indicated challenges with regards to sampling and scaling, having only a few actors participating, e.g. in questionnaires or surveys, or due to information being based only on expert interviews. Others, however, were able to find suitable solutions, e.g. by having chosen the main types of production, the nine key sectors or 17 indicators covering between 60-97% of the total agricultural production, to focus their samples. One country applied different collection methods and sources to five different product groups, with a sample size ranging between 85-100% of total production.

### *3.4.2 Food processing and manufacturing*

In 2020, food processing and manufacturing generated 24kg of food waste per capita, which accounted for 19% of total food waste in the value chain. This amount stayed the same in 2021 and increased slightly to 25kg per capita in 2022 (Eurostat, 2024).

([25]) Crop or animal loss prior to harvesting is not quantified as waste and material disposed on farm in a beneficial way is excluded from the scope (see art 2.1(f) of WFD). Research therefore estimates the scope of current EU measurement only covering ~10% of all FLW at the primary production level in the EU (Mason, R. et al., 2023).

#### *Measuring and reporting*

- Data collected under the EU Waste Statistics Regulation (EU) No 2150/2002/EC (European Parliament and Council, 2002) were somewhat easier to use for reporting on the processing and manufacturing stages, as 38% of the reporting countries chose this method.

- In 2020, the most common methods for in-depth measurement were direct measurement and questionnaires or interviews. However, the data collection methods were unclear for 21% of the datasets. For further details, see Figure 3.5.

- In 2020, among the voluntarily shared data for the processing and manufacturing stage, 38% related to edible food waste, 31% to concerned redistribution, and 25% focused on food transformed into feed.

#### *Methodological uncertainties and challenges*

Countries particularly experienced processing and measurement errors impacting data quality. Non-response errors were also very common. The heterogeneity of the actors represented a challenge for the Member States, particularly with regards to upscaling data collected from an — often small — sample. Countries shared that, for example, big food companies were overrepresented while particularly small business or certain sub-industries, such as fish or grain processing, were not represented. Another reported challenge was that companies were grouped under 'other industries' due to them being too diverse from each other rather than being comparable.

Interestingly, this stage also stands out for having the highest percentage of unclear responses about in-depth measurement methods, as well as the highest proportion of quality reports that indicated no errors at all.

### *3.4.3 Retail and other distribution of food*

Retail and other distribution of food accounted for approximately 8% or 10kg of EU food waste per capita in 2020. This figure dropped slightly to 7% (10kg) in 2021, before slightly rising again to 8% (11kg) in 2022 (Eurostat, 2024h).

#### *Measuring and reporting*

- Most retail and other food distribution food waste data for the reference year 2020 originated outside of the EU waste statistics or combined sources.

- Two main measurement approaches were observed:

    - Use of sales data, providing practical and accurate data from retailers and other food distributors. This was especially useful for individual prevention efforts and national comparisons. However, this approach has limitations, such as uncertainties when converting sales value into volumes. Additionally, sales data do not clearly differentiate between food that is wasted, donated or used for other products.

    - Use of waste collector's data, allowing for distinguishing food waste from food used at higher stages of the 'food use hierarchy'. However, challenges observed include sector-specific precision (such as identifying the sources of waste) and potential errors in volume estimation of waste containers if they are assumed to be full when they are not.

#### *Methodological uncertainties and challenges*

Additionally, measuring food waste from wholesale and online sales has proven difficult. Member States' approaches also vary in defining stage boundaries, with some, for example, excluding kiosks and gas stations from their calculations.
In 2020, this stage saw the highest levels of coverage and non-response errors compared to other value chain stages. For example, companies sometimes provided incomplete information or declined to share data due to internal policies. Despite these issues, some Member States reported high coverage rates — over 80%, 90% or even 99% of the national market. Moreover, the data collected were often detailed, covering various product groups. This level of detail was frequently achieved through voluntary agreements that included monitoring schemes. Estimating the proportions of edible versus non-edible food at the stage of retail and other distribution of food can be challenging.

### *3.4.4 Restaurants and food services*

In 2020, the restaurants and food services sector accounted for 9% (representing 12kg) of food waste generation per capita. It increased to 10% (13kg) in 2021 and 11% (15kg) in 2022 (Eurostat, 2024h).

#### *Measuring and reporting*

- In the restaurants and food services sector, most of the reported food waste data for 2020 came from dedicated studies or a combination of various sources. In 2020 and 2021, one country fully relied on the JRC food waste model results, as data collection was made too difficult by COVID-19. Another country used the estimation of the JRC Material Flow Estimation (MFA) (Method 2 of the MFA' sheet) to give an estimation of the edible oil and fat in the whole stage.

- Direct measurement was the most used method. To address the challenges posed by COVID-19 — reported by a third of countries as a significant issue for this sector in 2020 — other methods like coefficients, questionnaires and interviews as well as mass balance were also employed. These methods, although not originally suggested for this stage of the value chain, were adapted to meet the unique circumstances of the pandemic. See Figure 3.5 for more details.

- In 2020, half of the voluntarily shared information from countries focused on edible food waste, while a third of the datasets dealt with redistribution.

#### *Methodological uncertainties and challenges*

In 2020, the quality of food waste data from restaurants and food services was primarily compromised by processing and measurement errors. Notably, restaurants also exhibited the highest incidence of sampling errors compared to other sectors. In particular, the large variety of stakeholders complicated data acquisition and upscaling of samples.

In addition to the challenges posed by COVID-19, some countries reported difficulties in distinguishing between waste generated from commercial activities and that from households.

To address this issue, some countries are planning to enhance their waste declaration forms for better accuracy.

### 3.4.5 Households

More than half of the food waste in the EU-27-is generated by households, accounting for 55% equalling 70kg of food waste per capita in 2020, 56% in 2021 and 55% in 2022 (Eurostat, 2024h). As households are the biggest contributor to food waste, they also present a significant opportunity for reduction. Of the 332 food waste prevention actions by Member States reviewed in 2023, households were the most frequently targeted stage of the value chain with 89 actions. Notably, 51% of all efforts to prevent surplus and avoid food waste directed as households focused on 'informative and educational' measures (ETC CE, 2025).

#### *Measuring and reporting*

- Member States often used flexibility and creativity to gather household food waste data in 2020. Many countries combined different data sources and 14 Member States used a mix of in-depth measurement methods. Only six countries relied on a single method.

- The methods most applied were waste composition analysis and diaries, respectively by 10 and nine countries. Three countries reported to have conducted direct measurements.

- In addition to the three methods recommended in the delegated decision for measuring household food waste, some countries employed additional approaches not originally suggested. 11 countries applied coefficients, with nine of them combining this approach with other methods. Similarly, seven countries used questionnaires and interviews to complement other methods, while only one country relied on these as the sole method.

- The strong interest in gaining a deeper understanding of the household stage is evident in the voluntary data shared by countries. In 2020, all countries that provided voluntary data included information on the household stage and this high level of reporting continued in 2021.

#### *Methodological uncertainties and challenges*

For the household stage, countries reported the highest level of uncertainty for the collected data in the food value chain. Common issues included processing errors, model assumptions and measurement inaccuracies.

Countries encountered several challenges in measuring household food waste. Quantification was difficult due to the combined collection of food waste with garden waste and the challenge of estimating food waste in mixed municipal waste. Also, food waste composted at home is never recorded by waste collectors, so it requires estimation. To address these challenges, countries used panels, surveys and studies. Additional difficulties included not accounting for food waste in packaging and the complexity of defining a representative sample of households.

**Figure 3.5** **Comparison of individual value chain stages. Information from Member States' quality reports for the reference year 2020, presented in percentages of total information received per stage**

| | Primary production | Processing and manufacturing | Retail and other distribution of food | Restaurants and food services | Households |
|---|---|---|---|---|---|
| **Source of in-depth measurement data** | | | | | |
| On the basis of the data collected for the purposes of the EU Waste Statistics Regulation ** | 16% | 38% | 26% | 24% | 25% |
| On the basis of a dedicated study, e.g. scientific study, consultancy report | 34% | 18% | 29% | 29% | 33% |
| Other sources or combination of different sources, e.g. administrative reporting, voluntary commitments of the industrial sector | 50% | 44% | 44% | 47% | 42% |
| **In-depth measurement methods reported** | | | | | |
| Direct measurement | 20% | 26% | 20% | 27% | 7% |
| Waste composition | 6% | 5% | 7% | 12% | 22% |
| Questionnaires and interviews | 29% | 26% | 20%* | 17%* | 16%* |
| Coefficients | 29% | 16% | 20%* | 22%* | 24%* |
| Mass balance | 3% | 3% | 2% | 2%* | 0%* |
| Scanning/counting | 0%* | 3%* | 12% | 0% | 0%* |
| Diaries | 0%* | 0%* | 2%* | 2% | 20% |
| **Main issues reported for in-depth measurement methods** | | | | | |
| Processing | 30% | 28% | 21% | 25% | 25% |
| Measurement | 21% | 22% | 21% | 19% | 20% |
| Sampling error | 12% | 13% | 15% | 19% | 13% |
| Coverage error | 12% | 9% | 15% | 14% | 10% |
| Non response | 6% | 16% | 15% | 8% | 13% |
| Model assumption | 18% | 13% | 13% | 14% | 20% |
| **Total share** | 18% | 18% | 22% | 20% | 22% |
| **Voluntary data reported** | | | | | |
| Edible | 45% | 38% | 44% | 50% | 73% |
| Redistribution | 27% | 31% | 33% | 29% | 7% |
| Feed | 18% | 25% | 17% | 14% | 0% |
| Former foodstuff | 9% | 6% | 6% | 7% | 0% |
| Food drained as or with wastewaters | 0% | 0% | 0% | 0% | 20% |
| **Total share** | 15% | 22% | 24% | 19% | 20% |

◯ Highest value across the value change

* In depth methods not suggested but possible according to the delegating decision for this specific value chain stage

** Regulation 2150/2000/EC of the European Parliament and the Council

**Notes:** Sequential colour graduation applied to compare data within each value chain stage — lighter colours for smaller values, darker for greater ones.

**Source:** Author's compilation based on quality reports for the reference year 2020.

## 3.5 General challenges in measurement and reporting practices

### *3.5.1 Measurement*

The quality reports submitted by Member States highlighted several challenges faced in the measurement processes, as outlined below.

- For the reference year 2020, several countries reported challenges with correctly classifying food waste, such as having used incorrect waste codes or misassigned waste to inappropriate stages in the value chain. This issue often arose due to the manual selection of waste producers, leading to inconsistencies in reporting.

- Using multiple methods to evaluate food waste facilitates data collection, allowing for adaptation to the unique characteristics of individual value chain stages. However, countries have observed that results can vary significantly depending on the method employed. For instance, employing diaries or waste composition analysis to assess household food waste may yield different insights, leading to challenges in data interpretation. On the one hand, this variability complicates efforts to compare food waste metrics across different stages of the value chain, as discrepancies in methodology can hinder the establishment of a standardised understanding of food waste patterns and reduction strategies. On the other hand, countries also see advantages in combining several data collection methods, particularly as this allows an almost complete coverage of information and avoids the shortcomings associated with each method individually and provides full information.

- Several countries reported using estimates instead of actual data. The reasons for relying upon estimates highlight various data-related challenges, including 'limitations in sample size, exclusion of small subsectors or companies, incomplete surveys at different value chain stages, suboptimal estimation of coefficients for calculating fresh mass, misinterpretation of definitions by data reporters and difficulties in attributing waste measurements across multiple value chain stages.' (JRC, 2023a).

Table 3.1 provides an overview of positive measuring examples and challenges observed by countries for the reference year 2020. In the following years, several countries indicated that they had improved their measurement methodology and therefore revised earlier submitted data in the second and third data collection rounds.

**Table 3.1 Positive measuring examples and challenges observed by countries for the reference year 2020**

| | Positive examples | Challenges experienced by countries |
|---|---|---|
| **Direct measurement** | Households: waste analysis of household bins, in combination with questionnaires or a survey and coefficients.<br>Retail: individual countries reported a high coverage (e.g. over 80%, 90% or even 99%) of the whole national market. Good granularity of data (e.g. covering different product groups). | |
| | | Households: contamination by packaging.<br>Direct measurements based on smaller samples tend to be less representative of the entire country. |
| **Waste composition analysis** | Households: sampling of bio waste and other types of waste streams at collection sites; sometimes supported by a national manual to municipalities. Often combined with another measurement method. | |
| | | Households: relatively small and differing sample sizes (e.g. 255 apartments, 307 single-family houses or 1600 households). Excludes waste going to sewer or home composting. |
| **Diaries** | Households: participants could work on paper or online, sometimes with a digital kitchen scale. To improve data reliability, suggestion to increase sample sizes (with a minimum of 200 households) and to reduce non-response errors by sending daily notifications.<br>Diaries used to verify waste collector data or analyse edible parts; sometimes combined with questionnaires and coefficients. | |
| | | Households: varying and relatively small sample sizes (e.g. 68, 104, 284, or 1000). Accuracy challenges included respondents underestimating food waste, partly due to a lack of expertise — e.g. having difficulties understanding 'inedible part of food' — or the social stigma associated with wasting food. |
| **Mass balance** | Restaurants: to overcome data collection challenges caused by the COVID-19 pandemic and its intermittent measures, some countries used statistics, mass balance, and information collected from interviews and questionnaires with employees and owners for 2020. | |
| **Coefficients** | | Primary production: differentiating between harvested food and production left in the field is challenging. |
| **Questionnaires and interviews** | Primary production: distribution of specific questionnaires to selected companies over the national territory for nine key sectors of primary production, requesting data like volumes of production by type of product, the unsold volumes and the enhancement or reuse volumes, covering 11 months to consider seasonal impacts. The share of the primary production not included in the survey was estimated using the JRC material flow estimation method 1. | |
| | | For all value chains stages: respondents often underestimate the amount of food waste.<br>Primary production: family farm waste amounts reported may also include food waste from households or from animal feed.<br>Retail: some companies provided only partial information or none at all due to their internal policies. |

**Source:** Author's compilation based on quality reports for the reference year 2020.

In their quality report, a few Member States also highlighted discrepancies in their data for the reference year 2020 when compared to the food waste model results provided by the JRC. These differences may stem from variations in data collection methods or assumptions used in the model, which can lead to differences between national reporting and model-based estimates. The following points present a compilation of individual mentions and the reflections of single countries on the deviations:

- General reasons for data deviations include differences in national food waste definitions, which may exclude by-products from food production and variations in national measurement methodologies. For example, some countries do not account for food waste that is not treated in waste facilities, such as food composted at home or food disposed of via wastewater ([26]). Additionally, while

([26]) Note that this observation compared with an earlier version of the JRC model (JRC, 2023a), which did not differentiate between solid and liquid food waste. In the latest version published in 2024, the results are provided separately to facilitate the comparison with the data reported which are focused on the solid fraction (JRC, 2024b).

national approaches often rely on reported waste production, the JRC's method was also understood to use production statistics and natural or EU-wide loss coefficients. This lead to discrepancies between the two approaches.

- Specific comments were made regarding primary production, where discrepancies of the reported data by Member States and the estimates of the food waste model by the JRC in 2021 were the largest in primary production (JRC, 2024b), as detailed in Figure 2.9. Assumptions for these deviations found in the quality reports of individual Member States include impacts caused by the COVID-19 pandemic on data collection and analysis, as well as a general decrease in overall agricultural production. Countries also assumed that the JRC was not considering a large percentage of unsold food quantity which was actually destined for forms of reuse or enhancement in its MFA estimate. Countries also mentioned that existing fishing production data submitted to Eurostat — following the official procedure under the landing obligation to the Directorate-General for Maritime Affairs and Fisheries (DG MARE) — were not used to display the country's actual fishing production. Other potential reasons for deviations were seen in the range of agricultural waste rates varying depending on product group and the harvesting and production process applied, which is difficult to consider in the JRC model. There were also the practical difficulties of gaining a clear understanding of food loss as opposed to waste on farm sites.

- For retail, restaurants and household stages, one country saw the JRC's figures resonating more with the respective national data collection for these three areas when considering them together and interconnected.

### *3.5.2 Reporting*

Countries have made substantial efforts to prepare for the mandatory reporting of food waste data, with the testing phase for collecting and submitting data to Eurostat during 2018 and 2019 likely playing a crucial role in this preparation.

However, a review of the quality reports submitted for the reporting years 2020 and 2021 also revealed variations in how countries interpreted and completed the reporting templates. Notably:

- Some Member States emphasised providing extensive details about the sources of their reported in-depth data while offering limited information on the specific measurement methods used.

- In 2020, 16% of the datasets were difficult to review due to unclear descriptions; this figure rose to 22% in 2021, complicating the data review process for this report.

- There were inconsistencies in how countries reported the primary challenges encountered during measurement. While a few countries addressed all types of errors mentioned, others either left this section blank or reported no errors at all — this occurred for 9% of the datasets.

- Moreover, several countries that provided voluntary data submitted only numerical figures without any accompanying descriptions.

- Additionally, the level of description varies on how a certain measurement method was applied. Taking coefficients as an example, a few Member States only stated their use of this method by writing 'Coefficients and production statistics', for example, in their quality report. A few others provided very specific insights on how they calculated coefficients; for example, for mixed municipal waste, biodegradable waste, residual waste from retail, wholesale or auctions, or from key sectors in primary production for all agricultural production.

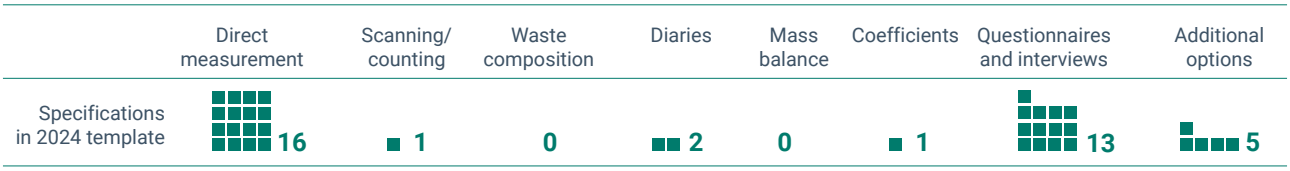
During the review of the quality reports, it was identified that there was a varying understanding of terms such as 'questionnaire' or 'survey' across different countries, leading to inconsistencies in the interpretation and reporting of the data.

On this basis, the potential to draw a comparison or derive insights from the reporting in the quality reports is limited.

To address some of these challenges, Eurostat introduced an updated quality report template in 2024. This template now includes an additional section on metadata, offering a drop-down menu which allows countries to select specific measurement methods, applicable for data from the reference year 2022 and with refinement options for previous years (2020 and 2021). Filling out this new section is voluntary for countries.

While descriptions of the measurement methods can be provided with varying levels of detail in the quality report, the new metadata section enables countries to additionally choose from 39 classified options to better specify their methods (see Figure 3.6 for details).

**Figure 3.6 39 classified options refining individual in-depth measurement methods**




**Source:** Author's compilation based on the updated quality report template from 2024, made available for the reference year 2022.

Such additional pre-classification of available methods could help address language and cultural differences that might affect how individuals complete the reporting template. This update is therefore expected to improve understanding of country practices and enhance data comparability by reducing the potential for misinterpretation during review.

A cross-comparison of the 2020 free-text entries and the drop-down entries from 15 countries (submitted in 2024, with updates to earlier data) suggests that the free-text options have allowed for some interpretation, as the results now slightly differ. Notably, waste composition and mass balance were not included as classifications in the 2024 metadata section, which likely prompted countries to choose alternative classifications for their previous reports. Furthermore, only six out of the 15 countries used coefficients in 2024 to describe the measurement methods for the 2020 value chain stages, while the ETC/CE team identified 28 references to coefficients in the original 2020 free-text entries. These discrepancies highlight the challenges in classification, especially regarding terms like 'survey', 'diary', or 'questionnaire and interviews', where boundaries can be fluid and are influenced by cultural and linguistic differences, as noted earlier.

## 3.6 Conclusions and reflections

### *3.6.1 Conclusions*

The EU and its 27 Member States have made significant progress in setting up the framework and systems used to measure and target food waste prevention. Targets have been set both nationally and on a European level. The provisional agreement on the targeted revision of the WFD foresees legally binding targets for each Member State to be achieved by 2030: 10% food waste reduction in food processing and manufacturing and 30% per capita reduction in retail, restaurants, food services and households.

Box 3.3

**Status of food WPPs, reduction targets and links to other policy domains**

- The analysis found that 24 countries have incorporated food waste prevention measures into their WPPs or waste management plans. Additionally, four Member States confirmed having a standalone food WPP. 15 Member States have introduced specific food waste strategies, action plans or legislation.
- Nearly all Member States that provided information (22 out of 25) reported having a national food waste reduction target. Over half (15 countries) specifically mentioned a commitment to the SDG Target 12.3, which aims to halve per capita global food waste at the retail and consumer levels as well as reduce food losses along production and supply chains, including post-harvest losses, by 2030.
- Eight EU Member States have included food waste in their national climate plans, with three more partially addressing it.
- Two Member States explicitly mention food waste in their biodiversity strategies, while a number of others refer to food in general.

**Source:** ETC CE, 2025.

Measures and actions have been implemented to prioritise the avoidance of surplus food and to promote human consumption over using surplus food for animal feed or non-food products. The most common types of actions to support food waste prevention at source are soft policy measures (ETC CE, 2025).

## Box 3.4

**Insights gained on food waste prevention actions implemented by EU-27**

- All Member States have implemented and prioritised actions to prevent food waste at source, in line with the 'food use hierarchy'.
- Of the mapped actions, 93% target the highest levels of the 'food use hierarchy'. Specifically, 66% focus on preventing food waste at source and 26% aim to donate or redistribute surplus food for human consumption, but only 1% focus on using surplus food for animal feed. The remaining actions address lower levels of the hierarchy, focusing on food waste treatment.
- For the top level of the hierarchy — preventing food waste at source — countries primarily rely on soft policy measures. These include informational and educational initiatives, voluntary agreements and supporting specific research or projects. Only 1% of actions involve regulatory interventions.
- While concrete actions to prevent and reduce food waste are implemented, slow progress is being made in evaluating the effectiveness of these measures. A positive example of how to overcome evaluation challenges from authorities and stakeholders is via the work of the European Consumer Food Waste Forum, which provides evidence-based technical reports and practical tools for addressing consumer food waste (EC, 2024b; JRC, 2023b; Candael et al., 2023). This is complemented by a recent JRC study covering further food value chain stages (De Laurentiis et al., 2024).

The WFD and its associated delegated and implementing decisions contribute to more harmonised measuring processes and improved methodologies. This is particularly key on a national level to inform actual and precise national food waste prevention policies and thereby enable the achievement of the legally-binding targets for each Member State provisionally agreed upon with the revised WFD. However, comparing, assessing and tracking progress in food waste prevention within a country as well as across Europe can still be improved in such areas as consistency and sufficiently robust data (yet still compounded by factors such as the COVID-19 pandemic).

The JRC's food waste model is designed to help Member States fill data gaps and enable Eurostat to benchmark and cross-check reported quantities to identify potential errors. The JRC considers this as particularly relevant for the years in which in depth-methods are not used (i.e. when the reported food waste quantities are estimated using Annex IV instead of Annex III of EU Delegated Decision (EU) 2019/1597). According to the quality reports, two Member States have used the model results so far, while five countries have specifically sought to understand discrepancies with their own data. This effort to identify and explain deviations is essential for refining both the in-depth measurements conducted by countries and the JRC's model. Addressing these issues requires continued research and the development of effective measurement methods for each stage of the value chain.

## Box 3.5

**Findings on EU-27 food waste measuring**

- As requested by the EU Delegated Decision (EU) 2019/1597/EC, countries prepared for the first mandatory reporting of food waste in 2020. 93% were able to apply in-depth measurements of food waste for this first reference year. Notably, 10 countries also continued their in-depth measurements of all value chain stages for the reference year 2021, with another 10 doing so for several value chain stages.
- When not conducting in-depth measurements, most countries used socioeconomic indicators to estimate food waste.
- Most Member States selected different in-depth measurement methods to collect food waste data at various stages of the food supply chain, accounting for the specific characteristics of each stage. Only two countries used the same method across the entire value chain, likely to ensure better national comparability between stages. Using multiple and varying methods to evaluate food waste can enhance data collection and help tailor approaches to the specific characteristics of each value chain stage. However, variability in results based on the employed methods — such as diaries versus waste composition analysis — complicates comparisons across stages.

The reporting obligations can be seen as a significant milestone to further support the important prevention and reduction framework. Although the available food waste data do not yet allow for an assessment of progress, the initial data collected from different stages of the food value chain highlight areas where improvements can be made. The reporting process to Eurostat has been successfully tested, helping clarify any misunderstandings as well as offer better guidance and enhance the overall effectiveness of the data collection and reporting process.

## Box 3.6

**Findings on EU-27 food waste reporting**

- For 26% of the in-depth measurement datasets shared for the year 2020, the EU Waste Statistics Regulation ([27]) was used for the data collection. In contrast, 46% of the datasets came from alternative sources, or from combined sources which were deemed more appropriate.
- The quality reports revealed that details from Member States on data collection and compilation for 2020 and 2021 were sometimes unclear or incomplete, with 16% of entries for 2020 and 22% for 2021 being affected. The 2024 introduction of a new, voluntary metadata section in the quality report with drop-down menus is expected to facilitate information-sharing and improve data comparability.
- In 2020, 13 EU-27 Member States shared voluntary data on food waste levels and prevention efforts. The data varied in coverage across value chain stages and categories. Each of the 13 countries addressed the household stage, but only seven countries shared voluntary data from primary production. Of the 74 provided datasets, 50% provided differentiated data on edible and non-edible food waste, while 26% concerned food donation and redistribution for human consumption.

([27]) EU Waste Statistics Regulation (EU) No 2150/2002/EC (European Parliament and Council, 2002).

### 3.6.2 Reflections

#### Targeting: food waste prevention is beneficial for biodiversity and climate

Climate change, biodiversity loss and food waste are deeply interconnected challenge. Reducing food waste can support climate change mitigation by lowering GHG emissions associated with waste. Conversely, mitigating climate change can help minimise food waste, as more stable agricultural conditions would reduce the need for surplus production (ETC CE, 2025). In a possible scenario described for 2050, the reduction of food waste has a 20% direct potential impact on biodiversity recovery, based on a restructure of the food and agriculture sector (Froslund et al., 2022).

Yet Member States' strategies often operate in isolation. While countries frequently implement policies in line with international agreements, they often fail to integrate these approaches across these key areas. To effectively tackle these challenges, it is essential to break down these silos and promote policy coherence. By identifying and capitalising on the synergies between climate action, biodiversity conservation and food waste prevention, more efficient progress can be achieved across multiple policy agendas simultaneously (ETC CE, 2025).

- To help address climate change and food waste effectively, the EU could give Member States guidance on how to integrate food waste reduction actions into their national energy and climate plans (EC, 2022). The EEA has outlined six general steps for countries to integrate circular economy measures, including food waste prevention, into the reporting on climate policies. These include the suggestion to connect experts and establish a transparent system for reporting; to use models to identify high-impact circular actions; to integrate circular economy emissions in climate reporting; to assess the need for further legislation; to monitor policy progress; and lastly, to refine and expand on these steps (EEA, 2024b).

- Acknowledging that most Member States have based their national biodiversity strategies on the United Nations Convention on Biological Diversity (UN Environment Programme, undated), the Eionet network or the EU FLW platform could support its members by facilitating the exchange of best practices for integrating food waste prevention actions into these policies, strategies and plans.

- Further research would clarify whether the exclusion of food waste from biodiversity strategies is due to the assumption that it is covered by other policies or indirectly through food system topics; a perceived lack of connection between the two issues or, for example, an insufficient exploration of potential overlaps (ETC CE, 2025).

#### Acting: following the food use hierarchy maximises human consumption and enhances resource efficiency

The legal foundation for food waste prevention is the WFD. Since its introduction, the focus has evolved from the general 'waste hierarchy' to the more specific 'food waste hierarchy' and then subsequently to the 'food use hierarchy' (JRC, 2020), offering guidance tailored to the unique aspects of food management. However, the interpretation of actions that qualify as food waste prevention varies among EU Member States (ETC CE, 2025). To address confusion among Member States regarding the interpretation of the 'food use hierarchy' and the classification of actions within its levels, the Directorate-General for Health and Food Safety (DG Sante), in collaboration with the JRC, has refined the accompanying descriptive text for each hierarchy level. These clarifications aim to better distinguish between 'prevention' and 'waste treatment' (De Laurentiis et al., 2024).

It is also essential to recognise the interconnectedness and potential intrinsic dilemmas among actions at different levels of the 'food use hierarchy', particularly considering the diverse requirements faced by Member States. For example, municipal waste recycling targets are driving a growing focus on food waste recycling, because food together with garden waste is usually the largest waste fraction in municipal waste. The WFD sets ambitious recycling and is preparing for reuse targets of 55% by 2025, 60% by 2030 and 65% by 2035. However, at least eight EU-27 Member States are already facing challenges in meeting the 2025 target (EEA, 2023a). Given that food waste constitutes a substantial portion of municipal waste, this could become a pivotal area for recycling efforts. Nevertheless, this transition may pose challenges for higher levels of the 'food use hierarchy', such as diverting surplus food from retail to anaerobic digestion with nutrient recovery, instead of towards potential food donation or the transformation to animal feed (ETC CE, 2025).

Another notable trend is the increasing emphasis on renewable and carbon-neutral fuel sources, particularly regarding energy recovery from food waste. This approach may inadvertently hinder the application of the 'food use hierarchy' by competing with the extraction of valuable bio-products or the redistribution of surplus food for human consumption. Subsidies for renewable energy and investments in waste-to-energy plants may steer surplus food toward biogas production rather than higher food use levels. Furthermore, rising energy market prices can lead to the redirection of surplus food from animal feed to biogas (ETC CE, 2025).

While it is crucial to acknowledge that some food waste treatment will always be necessary, especially for some parts of inedible food waste, the best approach from an environmental and ethical perspective is to manage surplus food with the aim to have higher value use, as indicated by Article 4(1) in the WFD and illustrated by the 'food use hierarchy'. Recycling and biogas production should be reserved exclusively for food not fit for human consumption or used as animal feed (Bowman and Luyckx, 2019; Bos-Brouwers et al., 2020) while other surplus food should be directed toward higher levels of the 'food use hierarchy' to maximise human consumption and resource efficiency (ETC CE, 2025).

***Measuring: further development and improvement of methodologies to track progress of waste prevention efforts***

Significant and continuous investments by Member States in measuring food waste are expected to lead to improved in-depth measurement methods and greater precision. Accurate tracking of progress toward targets can only be achieved once statistically reliable country-level measurements are available. Additionally, understanding the effectiveness of food WPPs and individual actions relies on thorough evaluation and monitoring. Therefore:

- EU-27 Member States should continue to invest in improving their food waste data collection. This includes learning from one another to address challenges with less developed data collection systems and errors affecting data quality. Member States also need to strengthen the robustness and representativeness of data collection. Enhanced knowledge-sharing but also capacity-building in monitoring and data collection, initially within and subsequently between countries (e.g. through Eurostat, the EC, the EU FLW platform and Eionet), could support these efforts.

- Such exchanges amongst Member States could also be used to identify methods that countries find in practice are most suitable for displaying efforts on food waste prevention. In addition, they can discuss further harmonising methods, therefore

keeping the framework flexible enough to accommodate and take into account regional economic realities.

- To develop and implement effective and precise national food waste prevention policies, countries would benefit from more detailed data, encompassing not only waste quantities but also the underlying causes of food waste and the overall functioning of the food supply chain.

- The insights gained from the voluntary data shared by Member States provide a valuable foundation for further knowledge development. Based on this information, recommendations could be made to increase efforts in areas where data are already widely shared, such as for edible versus non-edible or food surplus donations, aiming to enhance comparability and facilitate mutual learning. Additionally, focus could be directed toward areas with limited data availability to address existing knowledge gaps, such as on food waste drained as or with wastewater. This process could be led by, for example, Eurostat, the EC or the European FLW platform. Incentivising voluntary data reporting and future EU research funding through programmes such as Horizon Europe, Interreg Europe or LIFE+ could support these efforts.

- To address the ongoing challenge of lacking a robust evidence base for effective food waste prevention measures, upcoming policy efforts should focus on integrating a system of qualitative as well as quantitative indicators into all food WPPs ([28]) — and across interconnected sectors such as climate or biodiversity — to evaluate and monitor the measures. This should also promote a better understanding of how effective soft policy measures are and where other instruments such as regulatory interventions could be more suitable. In addition, EU support could be enabled through future EU funding programmes. This will help decision-makers to build a stronger foundation for evaluating, improving and choosing effective actions to prevent food waste at source.

***Reporting: gaining insights through continued reporting***

The annual reporting obligation for countries is expected to further streamline the processes, benefitting both the reporting countries and data analysis. In the coming years, gaining better insights into the methods used and the quality of the data collected could help address key questions, such as:

- Which 'other sources' are most promising for food waste data collection and could they be used in countries facing challenges with their current data sources?

- What are the advantages and disadvantages of using different measurement methodologies at various stages of national value chains versus adopting a uniform approach?

- How can the EU support countries in providing more accurate data when in-depth measurement methods are not used — for example, with guidance on the use of socio-economic indicators or on the approach based on waste statistics?

- How to best facilitate data collection and learn from each other for effective but cost-efficient measuring methods? Examples include developing tools and raising awareness.

([28]) For an example, see the evaluation of the French 'Garot Law' (EY, 2019).

- How can the best balance be found between simplified reporting — by requesting one food waste figure per value chain stage — and the use of multiple data sources and methods, which might offer more accurate insights?
- How can methodological uncertainties and errors in measurement methods be overcome, either in general or for specific value chain stages?
- How can comparability of voluntary data and their inclusion in the total food waste estimates be improved?
- Are countries willing and able to collect and share more voluntary data, such as information on edible food waste? In addition, could these data support further target setting for food waste reduction?

# 4 List of abbreviations

| Abbreviation | Name | Reference |
|---|---|---|
| CE | Circular economy | |
| COICOP | Classification of individual consumption by purpose (household final consumption expenditure) | |
| EEA | European Environment Agency | www.eea.europa.eu |
| EEE | Electrical and Electronic Equipment | |
| ETC CE | European Topic Centre on Circular Economy and Resource Use | ETC Circular economy and resource use (ETC CE) — Eionet Portal |
| Eionet | European Environment Information and Observation Network | https://www.eionet.europa.eu |
| EPR | Extended producer responsibility | |
| EU | European Union | |
| FLW | Food Losses and Food Waste | |
| GDP | Gross domestic product | |
| GVA | Gross value added | |
| GHG | Greenhouse gas | |
| JRC | Joint Research Centre (of the European Commission) | https://commission.europa.eu/about-european-commission/departments-and-executive-agencies/joint-research-centre_en |
| MSW | Municipal solid waste | |
| RMC | Raw material consumption | |
| SCIP | Substances of Concern in Articles or Complex Objects (Products) | https://echa.europa.eu/scip |
| SDG | Sustainable development goal | https://sdgs.un.org/goals |
| UNEP | United Nations Environment Programme | https://www.unep.org |
| WEEE | Waste from Electrical and Electronic Equipment | |
| WFD | Waste Framework Directive | https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en |
| WPP | Waste prevention programme | |

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# Annex 1 Overview of countries' waste prevention programmes (WPPs)

**Table A1.1 Member States waste prevention programmes**

| Country | Title of programme (English translation) | Link to programme |
|---|---|---|
| **Albania** | *Plani kombëtar i menaxhimit të integruar të mbetjeve*<br>(The national integrated waste management plan) | https://turizmi.gov.al/wp-content/uploads/2020/07/Dokumenti-i-Politikave-Strategjike_AL.pdf |
| **Austria** | *Abfallvermeidungsprogramm 2023*<br>(WPP 2023) | https://www.bmk.gv.at/themen/klima_umwelt/abfall/abfallvermeidung/publikationen/avprog.html |
| **Belgium - Brussels** | *PLAN DE GESTION DES RESSOURCES ET DES DÉCHETS Pour une consommation durable, sobre, locale et circulaire Pour une société zéro déchet* (Resource and Waste Management Plan (RWMP): For sustainable, moderate, local and circular consumption. For a zero-waste society.)<br>*La stratégie Good Food* (The Good Food strategy 2) | https://environnement.brussels/sites/default/files/user_files/pgrd_181122_fr.pdf<br>https://goodfood.brussels/sites/default/files/inline-files/GF_A4_strat_NL_def_05.pdf |
| **Belgium - Flanders** | *Uitvoeringsplan huishoudelijk afval en gelijkaardig bedrijfsafval* (Implementation plan for household waste and similar industrial waste)<br>*Lokaal Materialenplan 2023-2030* (Local materials plan 2023-2030)<br>*Actieplan Voedselverlies en biomassa(rest)stromen circulair 2021-2025* (Action plan food loss and biomass 2021-2025)<br>*Uitvoeringsplan kunststoffen 2020-2025* (Implementation plan plastics 2020-2025)<br>Op weg naar Circulair Bouwen. Beleidsprogramma 2022-2030 (Towards circular construction policy programme 2022-2030) | https://ovam.vlaanderen.be/uitvoeringsplan-huishoudelijk-gelijkaardig-bedrijfsafval<br>Ontwerp Lokaal Materialenplan 2023-2030 (vlaanderen.be)<br>Actieplan voedselverlies en biomassa(rest) stromen circulair 2021-2025 \| Vlaanderen.be<br>https://www.vlaanderen.be/publicaties/uitvoeringsplan-kunststoffen-2020-2025<br>https://ovam.vlaanderen.be/beleidskeuzes |
| **Belgium - Wallonia** | *Plan Wallon des Déchets-Ressources* (Walloon waste plan) | environnement.wallonie.be/rapports/owd/pwd/PWDR_3.pdf |
| **Bulgaria** | *Цел 1: Намаляване на вредното въздействие на отпадъците чрез предотвратяване образуването им и насърчаване на повторното им използване - Национална програма за предотвратяване на образуването на отпадъци*<br>(Objective 1 of the national waste management plan 2021-2028: Reduce the harmful effects of waste by preventing its generation and encouraging its reuse - National waste prevention programme) | https://www.moew.government.bg/bg/proekt-na-nacionalen-plan-za-upravlenie-na-otpaducite-2021-2028 |
| **Croatia** | *Odluka o donošenju Plana gospodarenja otpadom Republike Hrvatske za razdoblje 2023-2028* (Waste management plan of the Republic of Croatia for the period 2023-2028, including the waste prevention plan 2023-2028)<br>*Odluka o donošenju Plana sprječavanja I smanjenja nastajanja otpada od hrane Republike Hrvatske za razdoblje od 2023. Do 2028. Godine* (Food waste prevention and reduction plan of Croatia for the period 2023-2028) | https://mingor.gov.hr/UserDocsImages/UPRAVA-ZA-PROCJENU-UTJECAJA-NA-OKOLIS-ODRZIVO-GOSPODARENJE-OTPADOM/Sektor%20za%20odr%C5%BEivo%20gospodarenje%20otpadom/PGO%20eng_web%2011_12_2023.pdf<br>https://narodne-novine.nn.hr/clanci/sluzbeni/2022_12_156_2535.html |
| **Cyprus** | *(ΠΡΟΓΡΑΜΜΑ ΠΡΟΛΗΨΗΣ ΔΗΜΙΟΥΡΓΙΑ ΑΠΟΒΛΗΤΩΝ 2015-2021* (Waste Management Strategy 2015-2021) | https://www.moa.gov.cy/moa/environment/environmentnew.nsf/page20_gr/pag%20e20_gr?OpenDocument |

| Country | Title of programme (English translation) | Link to programme |
|---|---|---|
| **Czechia** | *Plán odpadového hospodářství České republiky pro období 2015-2024 s výhledem do roku 2035*<br>(Waste management plan of the Czech Republic for the period 2015-2024 with a view to 2035) | https://www.mzp.cz/C1257458002F0DC7/cz/poh_cr_prislusne_dokumenty/$FILE/OODP-POH_CR_2015-2024_2035_vlada-20220511.pdf |
| **Denmark** | *Handlingsplan for cirkulær økonomi*<br>(Action plan for circular economy) | https://mim.dk/media/s0rpgnej/handlingsplan-for-cirkulaer-oekonomi.pdf |
| **Estonia** | *Riigi jäätmekava 2023-2028*<br>(National waste management plan 2023-2028) | https://kliimaministeerium.ee/jaatmekava |
| **Finland** | *Kierrätyksestä kiertotalouteen: Valtakunnallinen jätesuunnitelma vuoteen 2027*<br>(From recycling to circular economy: national waste plan to 2027) | https://julkaisut.valtioneuvosto.fi/handle/10024/163978 |
| **France** | *Plan national de prévention des déchets (PNPD) 2021-2027*<br>(National waste prevention plan 2021-2027) | https://www.ecologie.gouv.fr/sites/default/files/Plan%20national%20de%20pr%C3%A9vention%20des%20d%C3%A9chets%202021-2027.pdf |
| **Germany** | *Wertschätzen statt wegwerfen - Abfallvermeidungsprogramm des Bundes und der Länder. Fortschreibung*<br>(Valuing instead of discarding - WPP by the federal government and the federal states) | https://www.bmuv.de/fileadmin/Daten_BMU/Download_PDF/Abfallwirtschaft/fortschreibung_abfallvermeidungsprogramm_bund_laender_bf.pdf |
| **Greece** | *Εθνικό Πρόγραμμα Πρόληψης Δημιουργίας Αποβλήτων 2021-2030*<br>(National WPP) | http://www.opengov.gr/minenv/?p=11636 |
| **Hungary** | *Országos Hulladékgazdálkodási Terv 2021-2027*<br>(National waste management plan 2021-2027) | https://cdn.kormany.hu/uploads/document/9/92/921/921c2f798773d4336ee3f45884a662d3018bb3d7.pdf |
| **Iceland** | *Saman gegn sóun*, included in *Í átt að hringrásarhagkerfi*<br>(Towards a circular economy) | https://www.stjornarradid.is/library/02-Rit--skyrslur-og-skrar/Stefna%20um%20me%C3%B0h%C3%B6ndlun%20%C3%BArgangs%202021-2032%20090621.pdf |
| **Ireland** | The National Waste Prevention Programme | https://www.epa.ie/publications/circular-economy/resources/national-waste-prevention-programme-annual-report-2021.php |
| **Italy** | *Programma nazionale di prevenzione dei rifiuti* (National WPP) | https://www.mase.gov.it/pagina/programma-nazionale-prevenzione-rifiuti |
| **Latvia** | *Atkritumu apsaimniekošanas valsts plāns 2021-2028*<br>(National waste management plan 2021-2028) | https://likumi.lv/ta/id/320476<br>https://polsis.mk.gov.lv/documents/6951 |
| **Lithuania** | *Valstybinis atliekų prevencijos ir tvarkymo 2021-2027 metų planas*<br>(National waste prevention and management plan 2021-2027) | https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/caef2783e1af11ecb1b39d276e924a5d?positionInSearchResults=12&searchModelUUID=5e15d9a6-5a7c-4d27-8063-a2d7abdbc8da |
| **Luxembourg** | *Plan national de gestion des déchets et des ressources — PNGDR*<br>(National waste and resource management plan) | https://environnement.public.lu/fr/offall-ressourcen/principes-gestion-dechets/Plan_national_de_gestion_des_dechets_PNGD.html |
| **Malta** | Long term waste management plan, 2021-2030 | https://era.org.mt/long-term-waste-management-plan-2021- 2030 |
| **Montenegro** | *Državni plan upravljanja otpadom u Crnoj Gori (2015-2020)*<br>(National waste management plan) | https://cistoca-hn.com/pdf/DR%C5%BDAVNI%20PLAN%20UPRAVLJANJA%20OTPADOM%202015-2020.pdf |
| **Netherlands** | *Afvalpreventieprogramma Nederland*<br>(Netherlands: WPP) | https://www.rijksoverheid.nl/documenten/rapporten/2021/02/18/afvalpreventieprogramma-nederland |

| Country | Title of programme (English translation) | Link to programme |
|---|---|---|
| **North Macedonia** | *План за спречување на создавање отпад Република Северна Македонија (2022-2028)*<br>(Republic of North Macedonia: plan to prevent waste generation, 2022-2028) | https://www.moepp.gov.mk/wp-content/uploads/2014/12/%D0%9F%D0%A1%D0%97%D0%9E-2022-2028.pdf |
| **Norway** | *Avfallsplan 2020-2025: Status og planer for avfallshåndtering, inkludert avfallsforebyggingsprogram*<br>(Waste plan 2020-2025: status and plans for waste management, including WPP) | https://www.regjeringen.no/no/dokumenter/avfallsplan-2020-2025/id2685578 |
| **Poland** | *Krajowy program zapobiegania powstawaniu odpadów (KPZPO) - Załącznik nr 1 do Krajowego planu gospodarki odpadami 2028*<br>(National WPP — attachment 1 to the national waste management plan 2028) | https://dziennikustaw.gov.pl/M2023000070201.pdf |
| **Portugal** | PERSU 2030<br>(Strategic plan for municipal waste)<br>PERNU 2030<br>(Strategic plan for non-municipal waste)<br>PNGR 2030<br>(National waste management plan) | https://apambiente.pt/residuos/plano-estrategico-para-os-residuos-urbanos-persu<br>https://apambiente.pt/residuos/plano-estrategico-para-os-residuos-nao-urbanos-pernu<br>https://apambiente.pt/residuos/plano-nacional-de-gestao-de-residuos-pngr |
| **Romania** | *Planul Național de Gestionare a Deșeurilor*<br>(National waste management plan) | http://www.mmediu.ro/categorie/planul-national-de-gestionare-a-deseurilor-pngd/239 |
| **Serbia** | National WPP for the period 2020-2025 | |
| **Slovakia** | *Program predchádzania vzniku odpadu Slovenskej republiky na roky 2019-2025*<br>(WPP of the Slovak Republic for the years 2019-2025) | https://www.minzp.sk/files/sekcia-enviromentalneho-hodnotenia-riadenia/odpady-a-obaly/registre-a-zoznamy/ppvo-sr-19-25.pdf |
| **Slovenia** | *Program ravnanja z odpadki i program preprečevanja odpadkov Republike Slovenije*<br>(Waste management programme and waste prevention programme of the Republic of Slovenia) | https://www.gov.si/assets/ministrstva/MOP/Operativni-programi/op_odpadki_2022.pdf |
| **Spain** | *Programa estatal para la prevención de residuos 2014-2020*<br>(State programme for waste prevention 2014-2020) | https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/planes-y-estrategias/planes-y-programas.html |
| **Sweden** | *Att göra mer med mindre*<br>(To do more with less) | https://www.naturvardsverket.se/publikationer/7100/978-91-620-7132-5/ |

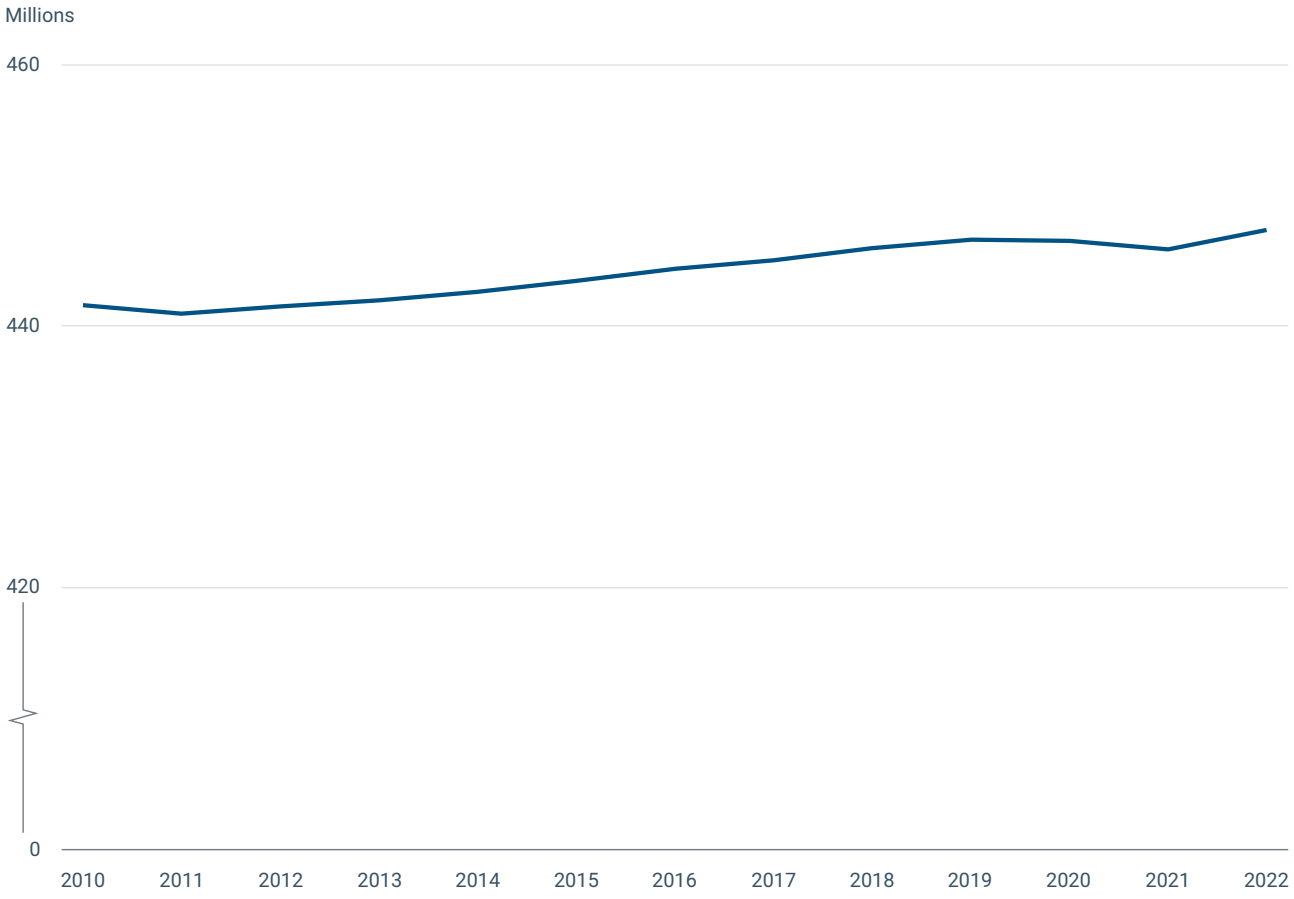
**Sources:** WPPs of Member States; EEA, 2025.

# Annex 2 Figures and tables from Chapter 2 'Tracking waste prevention progress'

## Figures for system context

### *Population*

**Figure A2.1 Population of EU-27, 2010-2022**

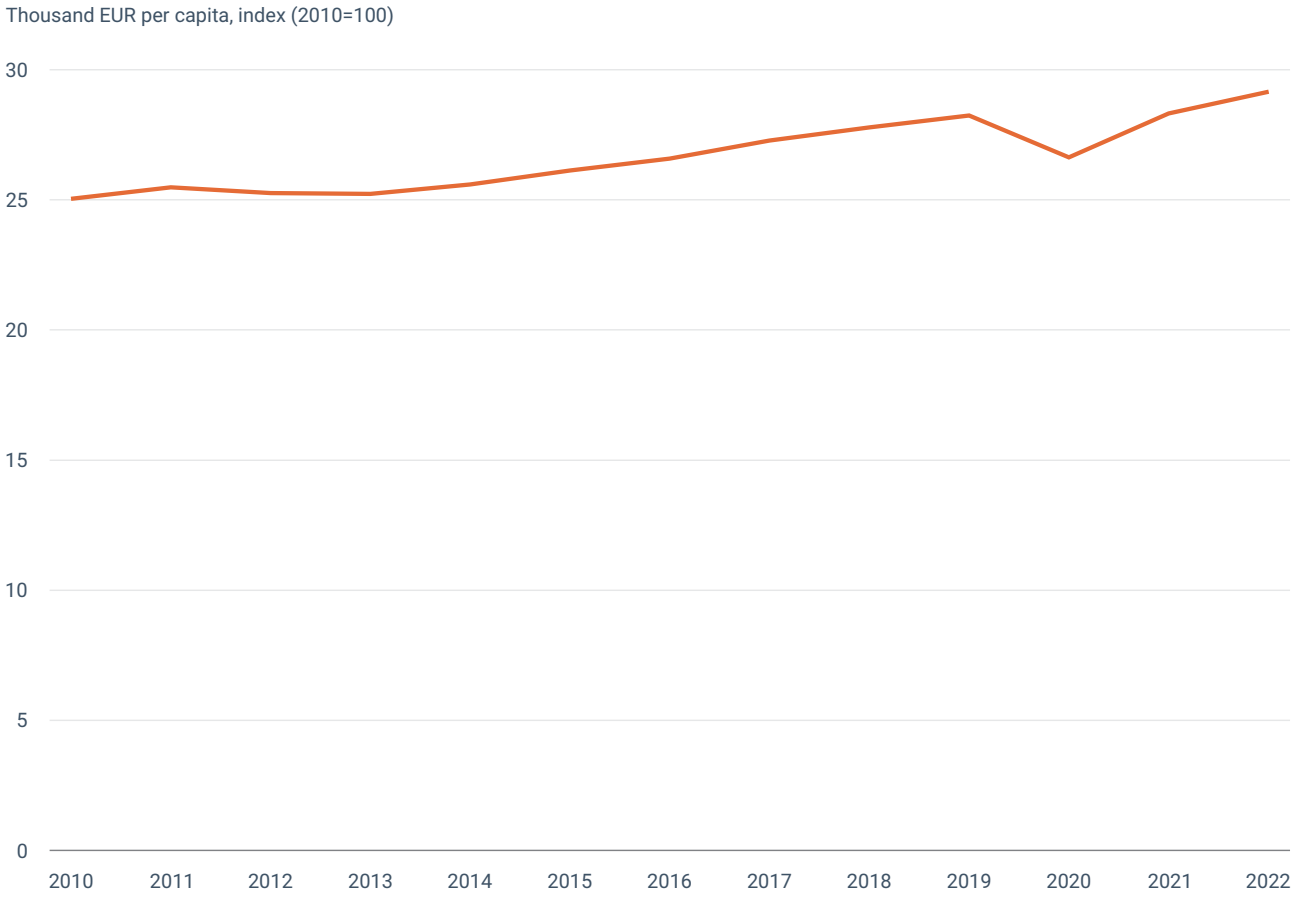



**Source:** Reproduced from Eurostat, 2024r.

An increase in population is usually connected to an increase in waste generation.

### *GDP*

**Figure A2.2 GDP at market prices, 2010-2022**

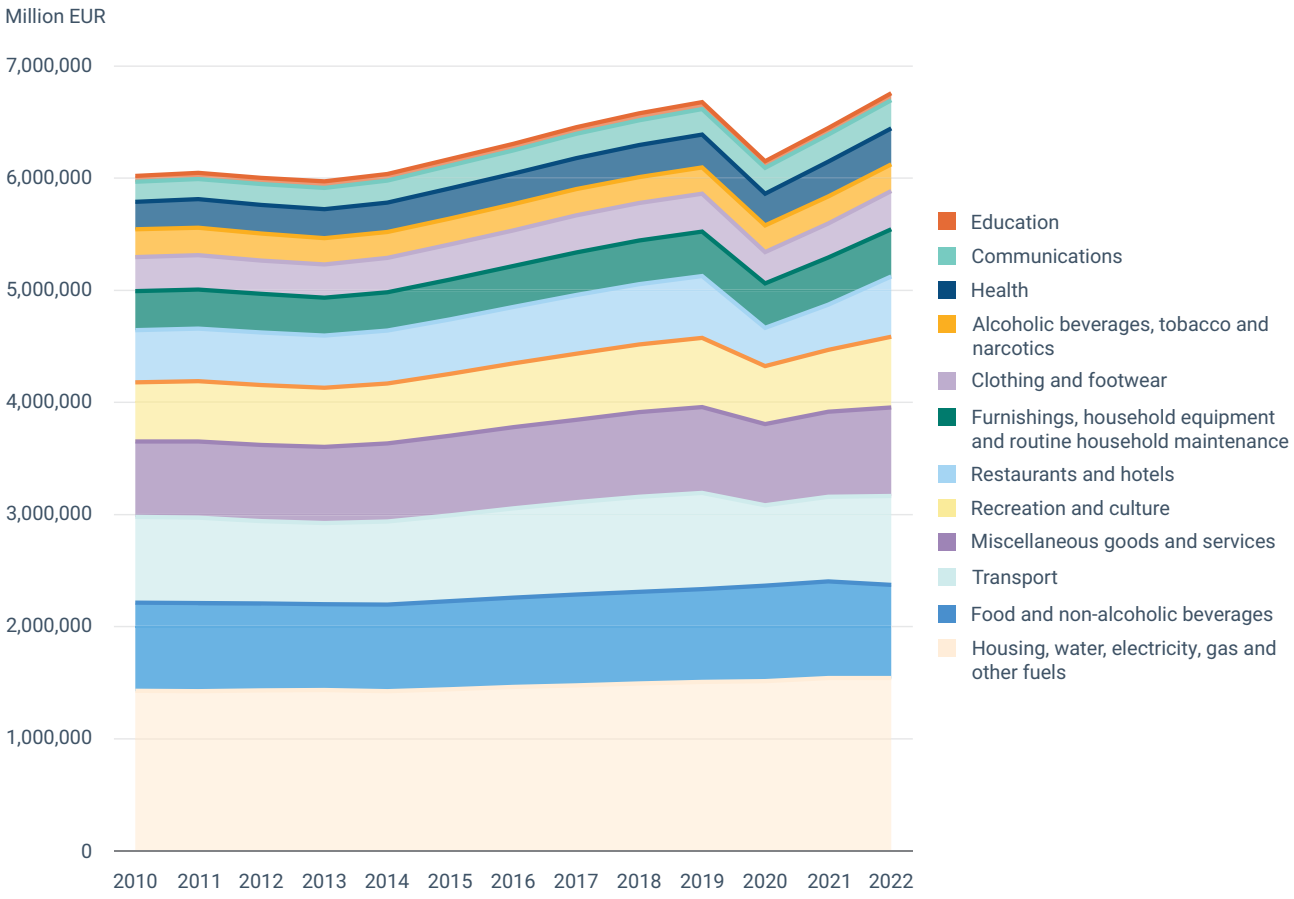



**Source:** Reproduced from Eurostat, 2024o.

The GDP of the EU-27 at market prices is expressed as chain-linked volumes (2010) to exclude the effect of inflation.

### *Household final consumption expenditure*

**Figure A2.3** **Final consumption expenditure of households by purpose (COICOP 3 digit), 2010-2022**




**Source:** Reproduced from Eurostat, 2024g.

Final consumption expenditure refers to the everyday spending made by resident households on necessities such as food, clothing and housing. Here, the final household consumption expenditure in the EU-27 is presented in chain-linked volumes (2010) to exclude the effect of inflation.

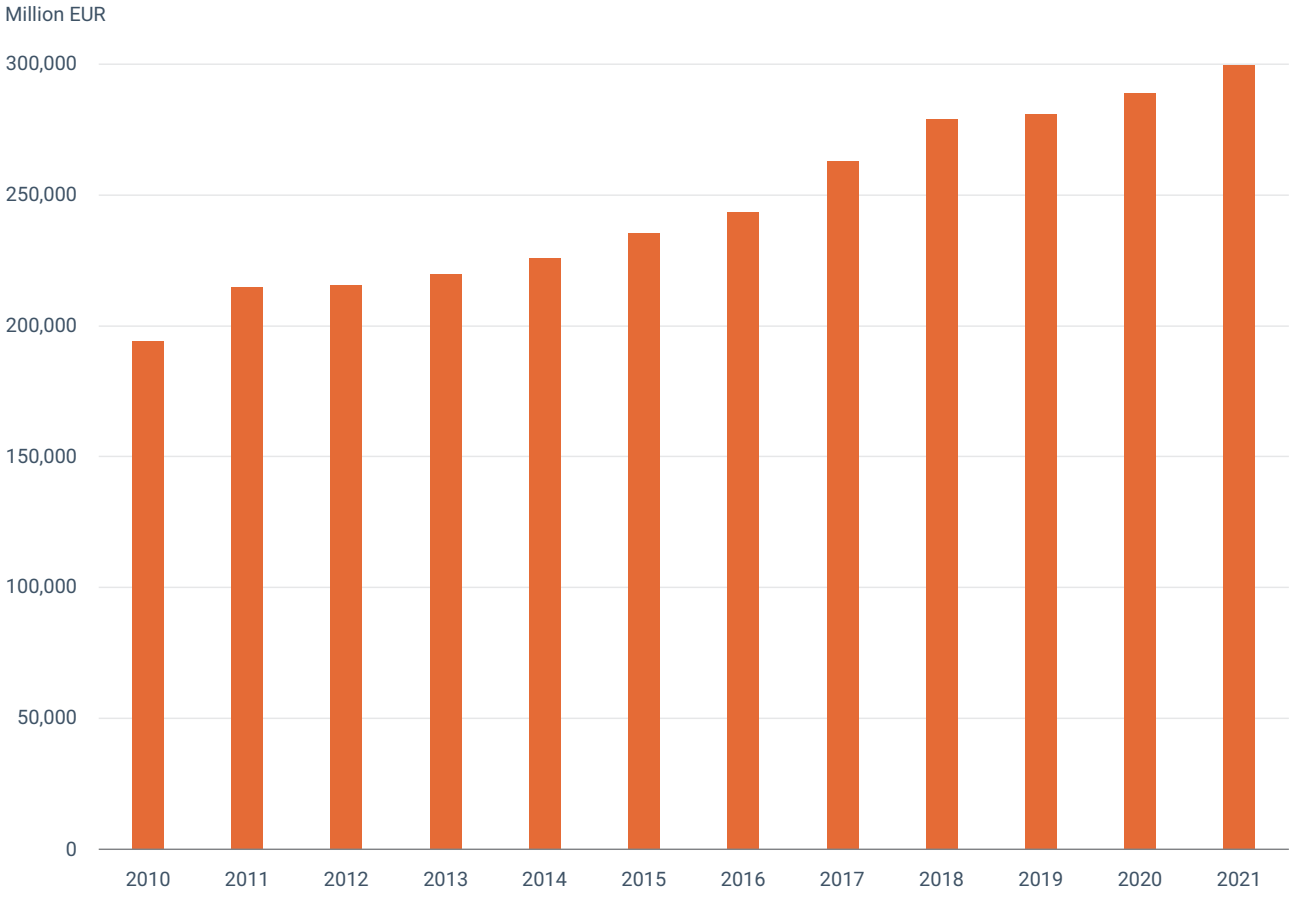
**Figure A2.4 Raw material equivalents by final uses of products, 2010-2022**

**Source:** Reproduced from Eurostat, 2024p.

### *RMC*

RMC represents the total amount of extracted raw materials needed to produce the goods and services consumed, irrespective of where the material extraction took place. The overall RMC per capita in the EU-27 is shown together with the main product groups for which most raw materials were used.

**Figure A2.5 Gross added value related to circular economy sectors, 2010-2021**



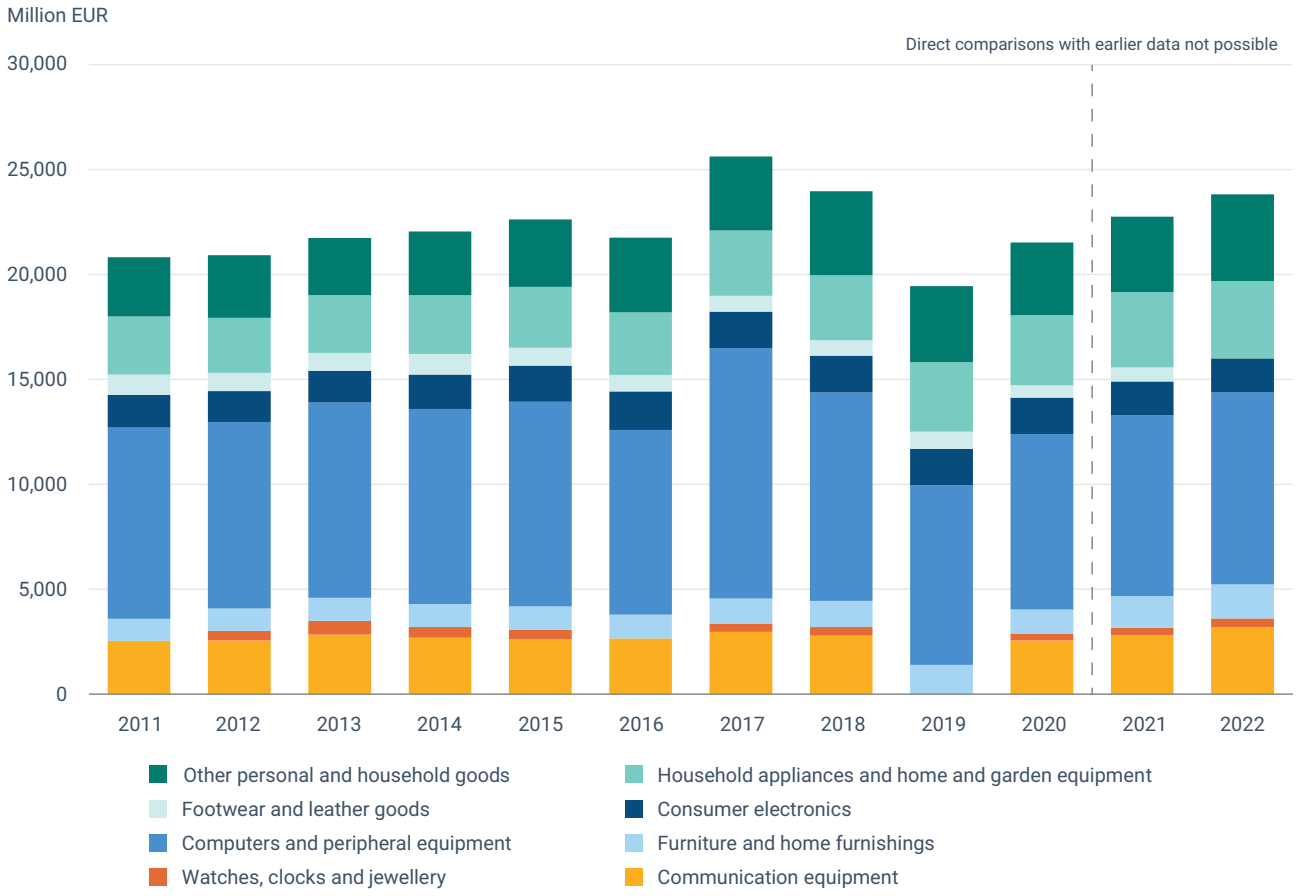

**Notes:** Previously reported in the framework indicator 'cei_cie010' was revised by Eurostat and currently gross value added is report in a new dataset, i.e., indicator cei_cie012. The whole time series of the new indicator can be evaluated and changes compared to data published in 2019 are due to methodological changes.

**Source:** Reproduced from Eurostat, 2024s.

### *Value added from reuse, repair and recycling*

The GVA of circular economy sectors at the EU level covers repair, reuse and recycling and represents the income from operating activities after adjusting

**Figure A2.6 Turnover of repair sectors, 2011-2020 and 2021-2022**




**Notes:** Repair of watches, clocks and jewellery figures were confidential data in 2011, 2016, 2019, while data in 2020 were estimated. Repair of computers and peripheral equipment figures were confidential data in 2019. Repair of consumer electronics figures were estimated data in 2021 and 2022. Repair of household appliances and home and garden equipment figures were estimated data in 2021 and 2022. Repair of communication equipment figures were estimated data in 2020 and 2022. Repair of footwear and leather goods figures were confidential data in 2022.

**Source:** Author´s compilation based on Eurostat, 2024a, 2024e.

for operating subsidies and indirect taxes (see dataset information page in Eurostat, 2024s).

### *Turnover in repair sectors*

**Table A2.1 Description of the different types of policy instruments**

| Type of policy instrument | Description |
|---|---|
| **Regulatory** | Most WPPs include some regulatory instruments. Romania and Slovakia, for instance, launched a ban on landfilling food waste or, respectively, biodegradable waste from wholesale, retail and distribution sectors from January 2023 onwards. This forced these stakeholders to explore prevention potentials more thoroughly. In contrast, single-use plastic bags have been banned in Austria since January 2020, following the rapid implementation of the EU Single-use Plastics Directive. Furthermore, a quantitative target to achieve a 20% reduction in single-use plastic packaging placed on the market by 2025 compared to 2018 was set in 2021. |
| **Market-based** | Market-based (i.e. economic) instruments aim to set economic incentives for changes in consumption or production patterns by making less waste-intensive alternatives more attractive. This type of instrument involves tax regulations (for example, in Bulgaria and Sweden), the introduction of fees for plastic bags (for example in most EU Member States) and other waste management operations so that 'waste-light' products or services become more competitive. The financial support for specific waste prevention measures can be counted as an economic instrument as well as an economic incentive for making sustainable purchases (for example in Portugal). EPR can also be categorised as a market-based instrument but it is kept separately here because of its distinct features. |
| **Voluntary initiatives or agreements** | Voluntary initiatives refer to actions taken by governmental or non-government stakeholders that are not legally binding or obligatory; agreements refer to agreements among various stakeholders. They do not necessarily require a political decision-making process but rather require negotiations. In 2016, for instance, the Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA) launched a symbiosis users network to enable industrial symbiosis in Italy. The network focuses on operational symbiosis issues to prevent waste and promote circular economy models. |
| **Informative** | Information instruments relate to campaigns for consumers or businesses. Romania, for instance, conducts awareness-raising campaigns on composting, the reduction of food waste and responsible paper consumption. In contrast, the Netherlands, states that it will implement an eco-design knowledge platform enabling businesses to access knowledge on a permanent basis. The underlying assumption is that better access to information will change consumer habits or nudge companies towards taking up cost-saving opportunities. |
| **EPR** | Includes the establishment of EPR schemes, whether legally binding at the EU level (i.e. WEEE, End of live Vehicles s and batteries) or voluntary. Also includes activities that affect the core strategy and operations of the EPR schemes. Excludes initiatives related to the EPR schemes (for example, a communication activity targeted at EPR actors would be classified as an informative instrument). Presumably this reflects EPR activities that are additional to existing legally-binding EPR schemes, as required by EU directives and regulations. |

**Source:** EEA, 2023b.

The structural business statistics data are now provided in separate datasets for the reference year 2021 onwards. This is due to significant methodological changes which prevent comparisons with earlier data.

**Table A2.2** **Percentage of EU-27 Member States with measures according to WFD Article 9(1), as well as targets and indicators for food waste**

| Measures, targets and indicators | Type of policy instrument | | | | | |
|---|---|---|---|---|---|---|
| | **Any instrument** | **Regulatory** | **Market-based** | **Voluntary initiatives or agreements** | **Informative** | **EPR** |
| Article 9(1)(g) and (h) measures | 96% | 52% | 19% | 85% | 63% | 0% |
| Article 9(1), other than (g) and (h) measures | 56% | 4% | 7% | 19% | 48% | 0% |
| Food waste measures, other than Article 9(1), for Member States with updated WPPs and country profile | 22% | 7% | 0% | 22% | 22% | 0% |
| **Quantitative targets** | 10 EU countries | | | | | |
| **Indicators** | 11 EU countries | | | | | |

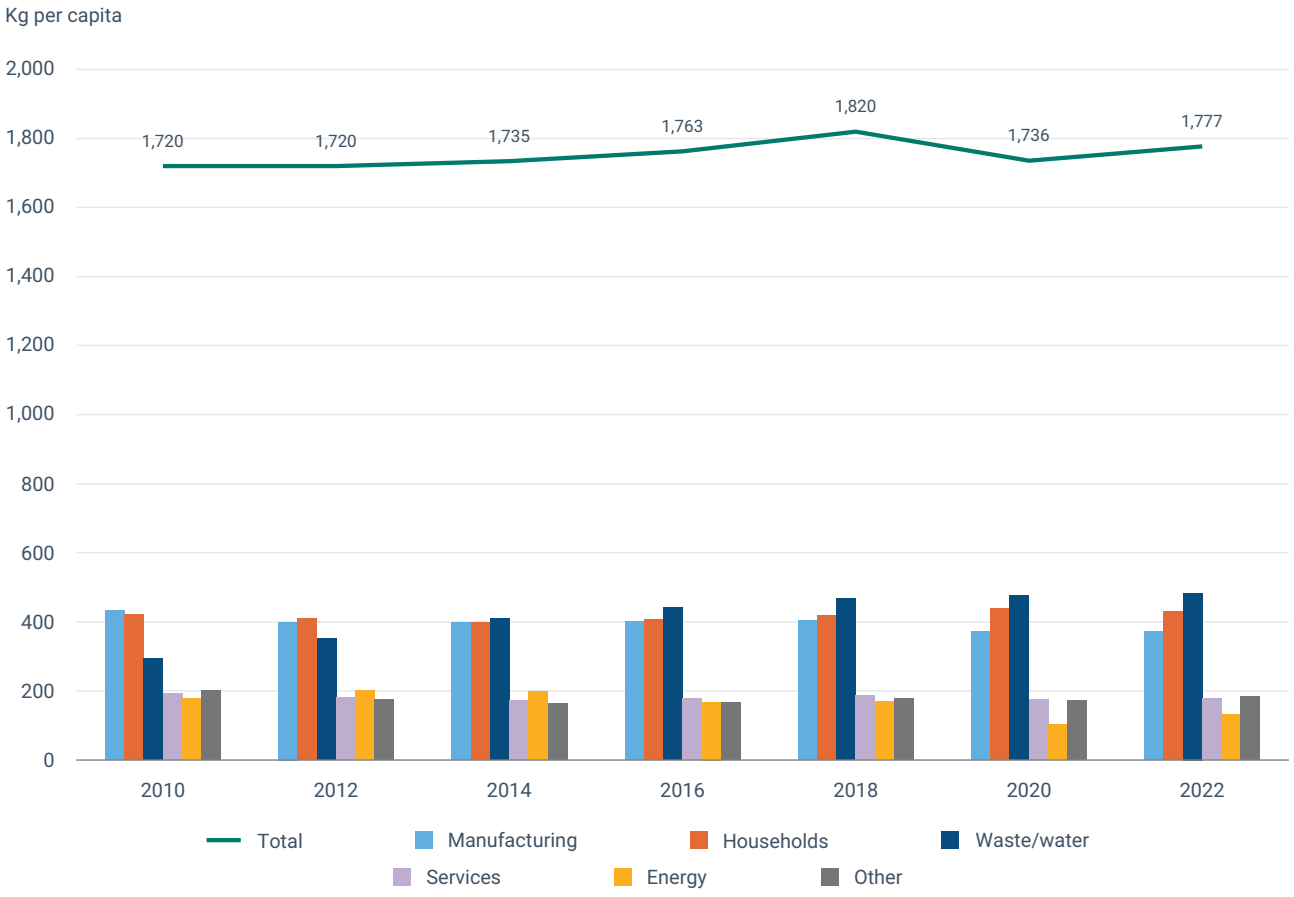
**Sources:** WPPs of EU-27 countries; EEA, 2025.

## Tables for policy enablers

Policy instruments for prevention are conceived here as tools or mechanisms used to support and enforce proposed waste prevention measures contained in a Member State's WPP. Different types of policy instruments are outlined in Table A2.1.

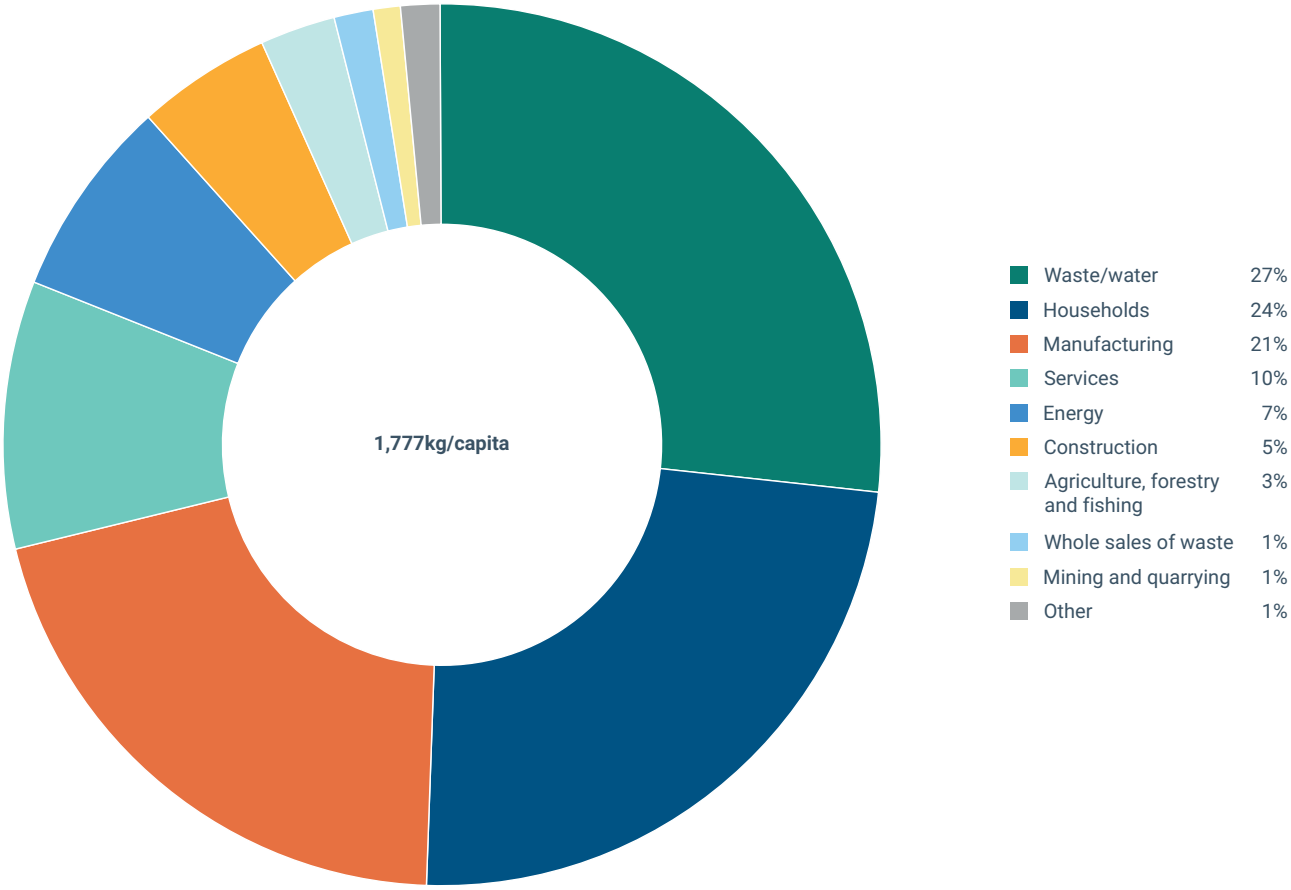
Analogue as for the generic waste prevention measures, Table A2.2. indicates the percentage of Member States with prevention measures in place that specifically

**Figure A2.7** **Total waste generation per capita, excluding major mineral waste and its breakdown by economic activities and households in the EU-27, 2010-2022**




**Source:** Author´s compilation based on Eurostat, 2024l; households for 2012 and 2014 based on Eurostat, 2024u.

**Figure A2.8** **Waste generation (excluding major minaeral waste) by economic activities and households, EU-27, 2022**




**Source:** Reproduced from Eurostat, 2024l.

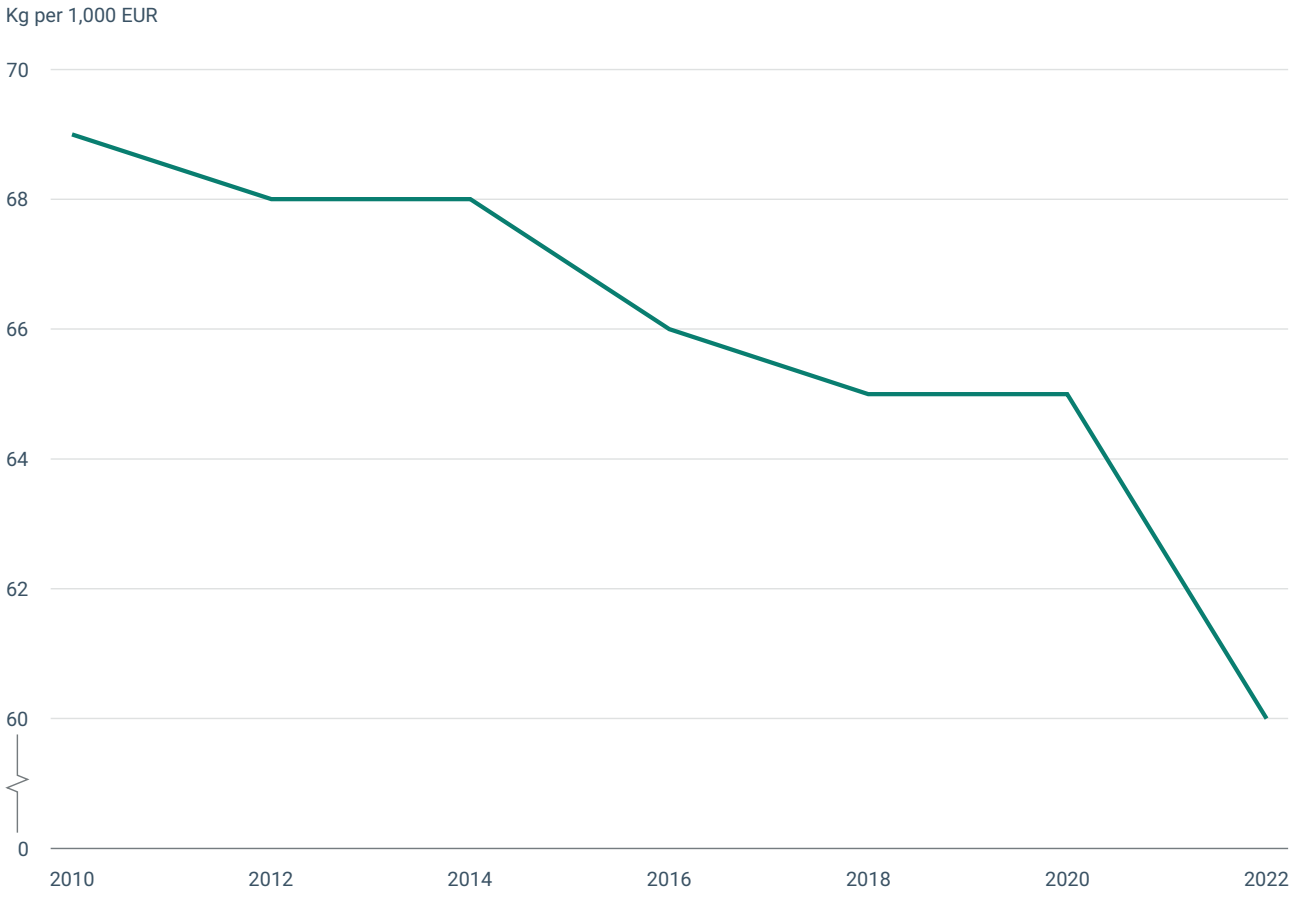
**Table A2.3** **Breakdown of total waste (excluding major mineral wastes) generation per capita by economic activities and households in the EU-27, 2010-2022, including changes between 2010-2022 and 2018-2020**

| | 2010 | 2012 | 2014 | 2016 | 2018 | 2020 | 2022 | Change 2010-2022, kg | Change 2018-2020, kg |
|---|---|---|---|---|---|---|---|---|---|
| **Total** | **1,720** | **1,720** | **1,735** | **1,763** | **1,820** | **1,736** | **1,777** | **57** | **-84** |
| Waste/water | 295 | 352 | 408 | 442 | 467 | 476 | 483 | 188 | 9 |
| Households | 422 | n/a | n/a | 407 | 417 | 438 | 430 | 8 | 21 |
| Manufacturing | 432 | 400 | 397 | 402 | 403 | 371 | 372 | -60 | -32 |
| Services | 193 | 182 | 173 | 177 | 186 | 176 | 177 | -16 | -10 |
| Energy | 178 | 201 | 197 | 168 | 170 | 102 | 132 | -46 | -68 |
| Agriculture, forestry and fishing | 46 | 46 | 40 | 44 | 43 | 46 | 50 | 4 | 3 |
| Construction | 95 | 90 | 87 | 85 | 92 | 87 | 89 | -6 | -5 |
| Mining and quarrying | 18 | 17 | 17 | 16 | 18 | 17 | 18 | 0 | -1 |
| Other | 41 | 26 | 6 | 22 | 24 | 23 | 26 | -15 | -1 |

**Source:** Reproduced from Eurostat, 2024l.

target food waste, categorised by the type of policy instrument. WFD Article 9(1) contains two paragraphs that refer exclusively to food waste prevention: (g) 'Reduce the generation of food waste' and (h) 'Encourage food donation and other redistribution'.

**Figure A2.9 Waste intensity indicator: total waste generation excluding major mineral waste (kg) per GDP unit in the EU-27, 2010-2022**




**Source:** Reproduced from Eurostat, 2024m.

## Figures and tables for waste output

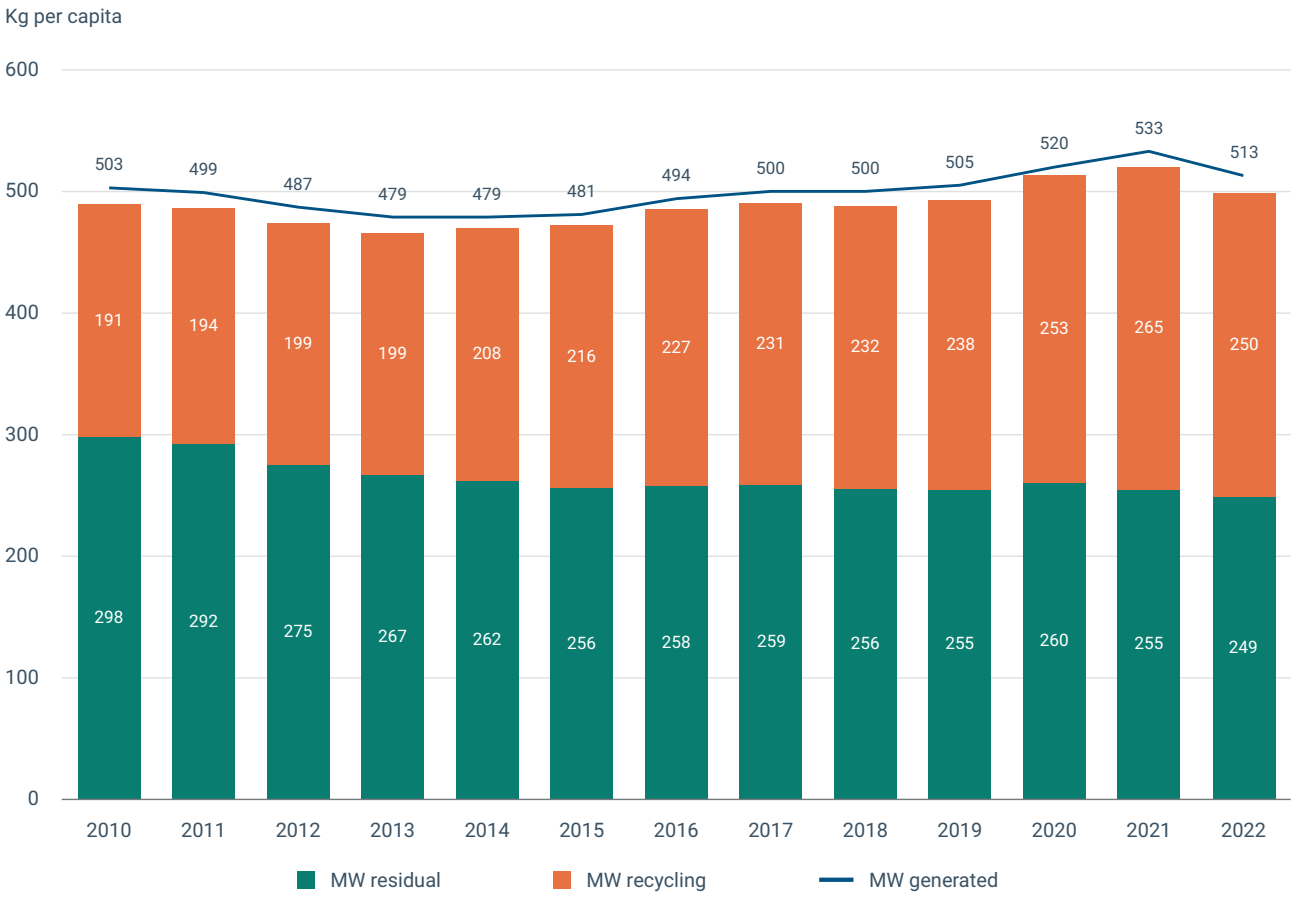
### *Total waste (excluding major mineral waste) generation*

The indicator for total waste (excluding major mineral waste) was selected within the prevention framework. This is because total waste includes a large proportion of mineral waste, which, despite its substantial share, is generally inert and poses fewer environmental risks.

### *Waste intensity of net waste volume (excluding major mineral waste)*

The waste intensity indicator provides insight into the efficiency of resource use in an economy by showing how much waste is produced per unit of economic activity and the decoupling of economic growth from waste generation. It can also partly

**Figure A2.10 Municipal waste and residual municipal waste per capita and percentage of residual per total municipal waste treated in the EU-27, 2010-2022**

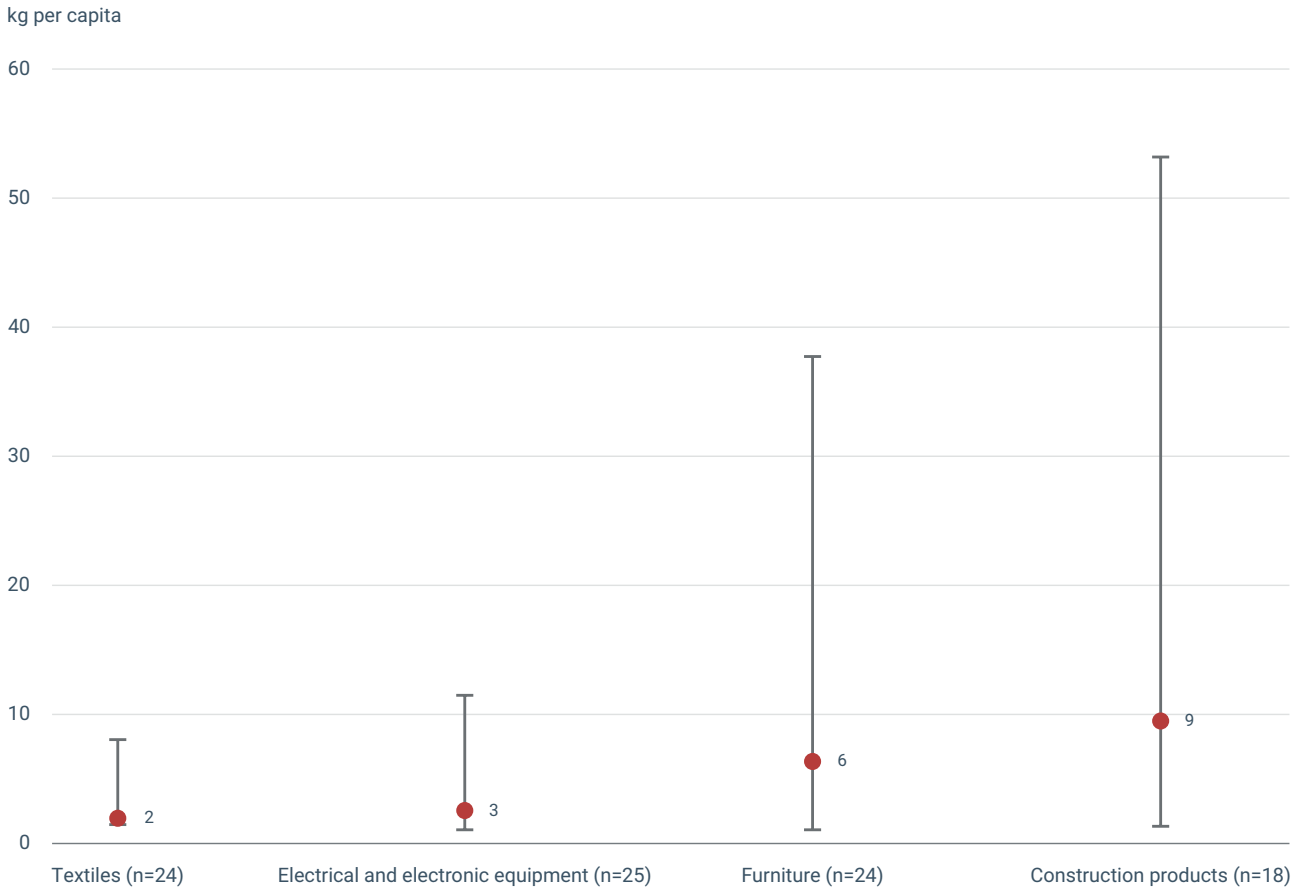



**Notes:** MW, municipal waste. Recycling includes material recycling, composting and digestion. Residual municipal waste calculated based on Eurostat data on treatment and consists of the sum of the three treatment types: Disposal — incineration (D10), Recovery — energy recovery (R1) and Disposal — landfill and other (D1-D7, D12)).

**Source:** Reproduced from Eurostat, 2024q.

reflect the structure of the economy, when less waste-intensive sectors (for example,

**Figure A2.11 Average per capita reuse reported by EU Member States (reference year 2021)**



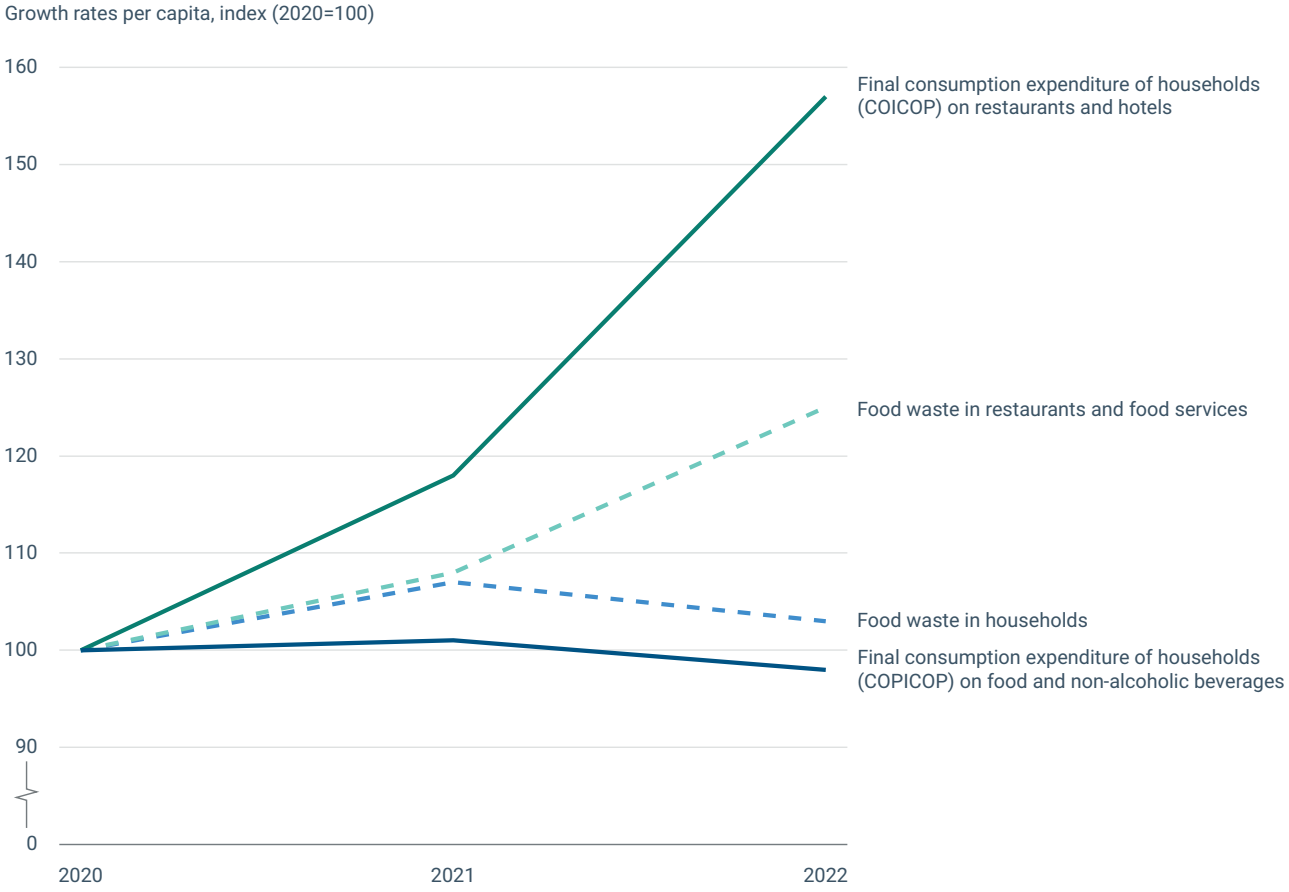

**Source:** EEA, 2024h.

services) replace more material-intensive activities (for example, manufacturing).

### *Municipal waste generation*

Municipal waste generation was selected as an indicator due to its high visibility, complex composition, central role in national waste prevention programs and significant potential for improvement through targeted measures. Households typically generate the largest portion of MSW; they are the main contributors to total waste generation (excluding major mineral waste) and other waste streams such as

**Figure A2.12 Changes indexed to 2020 for disaggregated indicators in Cluster 1 and Cluster 3: food waste in households, food waste in restaurants and food services, final household consumption expenditure on restaurants and hotels and final household consumption expenditure on food and non-alcoholic beverages, EU-27, 2020-2022**



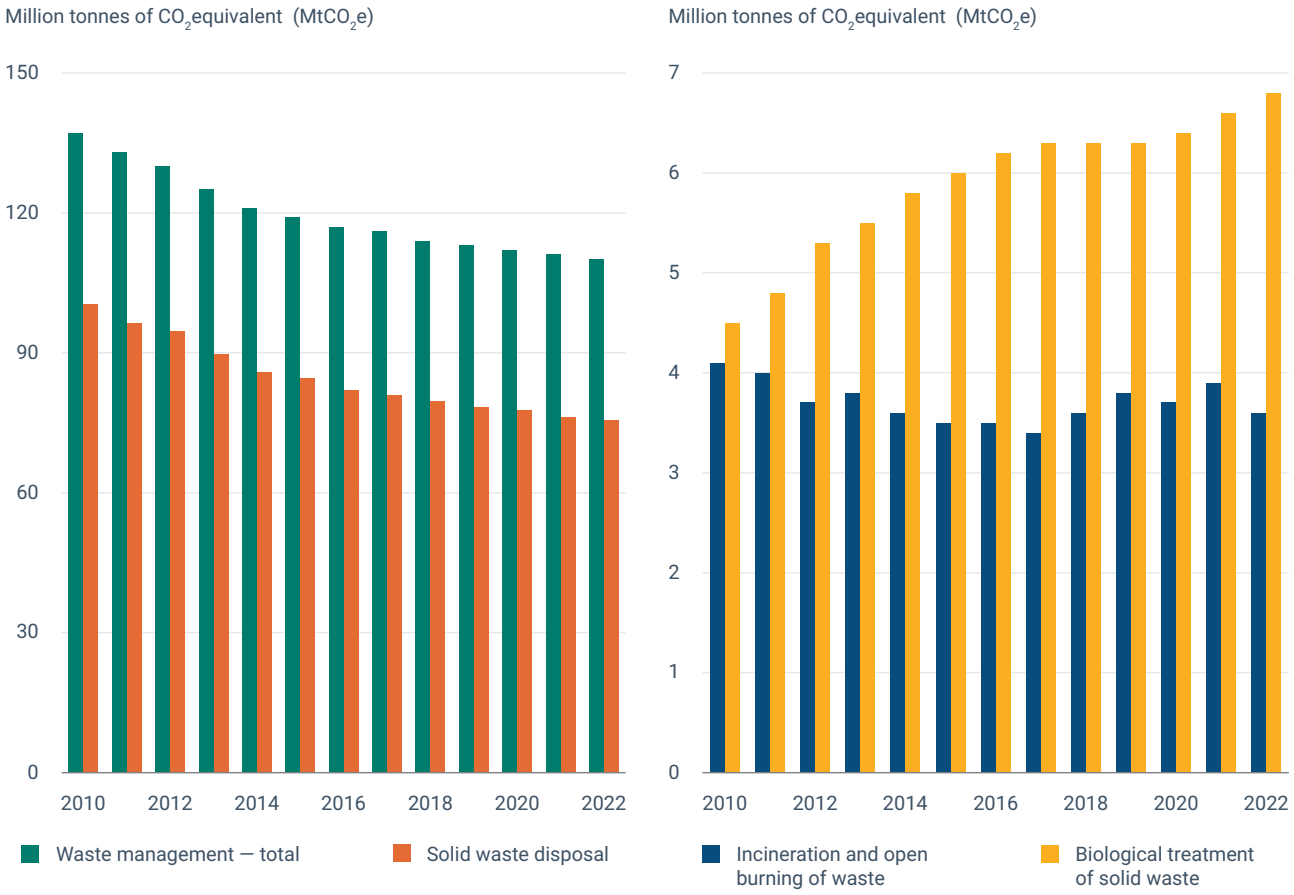

**Note:** Eurostat data are collected on a per capita basis.

**Sources:** Author's compilation based on data from Eurostat, 2024j, 2024f.

food waste. Municipal waste constitutes approximately 29% of total waste excluding major mineral waste, or 11% of all waste generated in the EU.

Residual municipal waste refers to waste disposed of through incineration and landfilling, as reported to Eurostat. Under the new reporting rules (EU Decision (EU) 2019/1004), this includes both waste collected as residual and also sorting residues that cannot be recycled. Recycling figures, meanwhile, should only reflect waste that is actually recycled, excluding materials that cannot be or are not recycled (for example, rejects and missorted materials).

**Figure A2.13 GHG emissions in the waste management sector (in $CO_2$ equivalents)**




**Notes:** The data on biological treatment and incineration are on a much lower scale than those for the other waste treatment methods. The data were plotted on separate scales to allow greater resolution of the trends of these two indicators.

**Source:** Reproduced from Eurostat, 2024n.

### *Reuse*

#### *Food waste generation*

The indicator is based on Eurostat data on food waste generation, reported annually by Member States since the reference year 2020.

Figure A2.12 indicates the potential impact of COVID-19 by linking food waste trends to household consumption expenditure, indexed to 2020 to illustrate the change over time. While food waste from restaurants and food services increased by 25% within the segment 'restaurant and food services', this corresponds to only a 3kg food waste per capita increase between 2020 and 2022 (Figure 2.9).

#### *GHG emissions*

The reduction in the environmental impact of waste generation can be partially tracked through GHG emissions from the waste management sector. This indicator is composed of four sub-indicators — GHG emissions (in million tonnes of $CO_2$ equivalent) from: (1) total waste management (including wastewater treatment), (2) solid waste disposal, (3) biological treatment of solid waste, and (4) incineration and open burning of waste. It is important to note that GHG emissions from recycling, backfilling and energy recovery operations are excluded from this indicator. Waste incineration without energy recovery accounts for only about 7.6% of all incinerated waste (Eurostat, 2024u).

### Policy enablers in the context of system and waste output

This section aims to assess whether there are significant changes in the waste prevention measures that Member States employ in their WPPs and also explores how such developments may have influenced the waste outputs analysed in Section 2.2. It should be noted that the WPPs of 21 countries have remained since the last evaluation in 2023. New or updated WPPs issued from Austria, Estonia, Croatia, France, Poland and Portugal are included in this analysis.

#### *Common waste prevention measures and policy instruments found in WPPs*

The single most common measure in the WPPs of EU-27 countries focuses on '**Encouraging reuse and repair**' (WFD Article 9(d)), with a slight increase (+7%) observed as compared to the previous analysis (Table 2.1). The potential effects of this measure on prevention are discussed in detail in the analysis and progress tracking section (Reuse and Repair). '**Promoting sustainable consumption models**' (WFD Article 9(a)) and '**Developing and supporting information campaigns**' (WFD Article 9(m)) have maintained their top positions with all but one Member State considering these measures, while '**Reducing the generation of food waste**' (WFD Article 9(g)) retains its position in third place. All these four measures account for the majority of policy instruments applied, highlighting the strong focus placed on them by Member States (Table A2.4).

The measures for 'Promoting sustainable consumption models' are primarily supported by voluntary initiatives, agreements and informational instruments and are expected to contribute to a reduction in RMC. However, the lack of time series data from Cluster 2 indicators limit the ability to assess the direct impact of these measures on the RMC. Sustainable consumption initiatives have the potential to decouple waste generation from GDP. The relative decoupling observed might be

a result of policy measures. However, the amount of waste remains closely linked to economic growth, as illustrated by the COVID-19 years and the associated economic slowdown.

The increased focus on 'Reducing the generation of food waste' (WFD Article 9(g)) in the national WPPs is likely driven by heightened attention at the EU level, spurred by new reporting requirements and targets in upcoming updates to the WFD. Analysing the effects of specific measures or policy instruments at the national level would be the most effective approach. However, it seems that no EU country is currently conducting a comprehensive assessment of the effectiveness of food waste prevention policy measures, according to the recent ETC report (ETC CE, 2025).

### *Waste prevention measures that are rarely or not found in WPPs*

The EEA report (EEA, 2023b) discussed the extension and application types of instruments. When a specific policy instrument is present in less than 10% of EU-27 countries' WPPs (Table 2.1), it is considered a 'gap' for this analysis. However, a gap does not necessarily indicate an area requiring improvement in waste prevention, as certain policy instruments may not be applicable to specific measures. For instance, no significant gaps were identified for regulatory measures except for 'Developing and supporting information campaigns to raise awareness' (WFD Article 9(m)), which may be less suitable than other measures for certain policy objectives.

As noted previously, market-based instruments are seldom applied to measures such as: 'Targeting products with critical raw materials' (WFD Article 9(c)); 'Encouraging the availability of spare parts' (WFD Article 9(e)); 'Reducing food waste generation' (WFD Article 9(g)); 'Promoting the reduction of hazardous content' (WFD Article 9(i)); and 'Halting the generation of marine litter' (WFD Article 9(l)) (Table 2.1).

Only 6% of all identified waste prevention measures in a Member State are classified as market-based interventions (Table A2.4). This may indicate real gaps in waste prevention efforts or a lack of comprehensive documentation of relevant actions in the WPPs. Economic instruments such as fees, taxes and subsidies should be both feasible and effective for these measures. Interestingly, 'Encouraging food donation' (WFD Article 9(h)), which previously had limited use of market-based instruments, has seen a significant increase (+8%) in the number of Member States applying this approach following recent updates.

Interestingly, most Member States continue to favour soft policy instruments, such as voluntary initiatives, agreements and informational campaigns, reflecting trends similar to those observed in the previous analysis. Of a total of 1037 waste prevention measures identified in the EU-27 Member States' WPPs and categorised according to WFD Article 9(1), 46% implied the deployment of voluntary instruments and agreements (Table A2.4). Most particularly, measures to encourage the re-use of products and the setting up of systems promoting repair and re-use activities (WFD Article 9(d)) as well as to reduce the generation of food waste (WFD Article 9(g)) lean heavily on this type of policy instrument. More than a third of the measures (35%) are supported through informative tools, similar to the analysis from 2023 (33%) (EEA, 2023b).

Obviously, this is the case for most of the measures that are listed under 'Develop and support information campaigns' (WFD Article 9(m)), but the measures categorised as 'Reducing food waste generation' (WFD Article 9(g) and 'Promote and support sustainable consumption models' (WFD Article 9(a) also often use this kind of instrument. Regulatory interventions account for 11% of total measures; this is down slightly from 13% in the analysis from 2023 (EEA, 2023b). They are

relatively common for measures to 'Identify products that are the main sources of littering' (WFD Article 9(k)) and also, to some extent, used for other measures such as to reduce the generation of food waste (WFD Article 9(g)). Only 2% of all identified waste prevention measures relate to EPR systems; many of them related to 'Encourage resource-efficiency, durability, reparability, reusability and upgradability' (WFD Article 9(b)) (Table A2.4).

**Table A2.4 Number of policy instrument types referenced in WPPs under measures from WFD Article 9(1) in EU-27**

| Article 9(1) | Regulatory | Market-based | Voluntary initiatives/ agreements | Informative | EPR | No of instrument types |
|---|---|---|---|---|---|---|
| (a) Sustainable consumption models | 12 | 16 | 50 | 55 | 3 | **136** |
| (b) Encourage resource-efficiency, durability, reparability, reusability and upgradability | 3 | 7 | 59 | 23 | 6 | **98** |
| (c) Target products containing critical raw materials | 7 | 0 | 23 | 8 | 1 | **39** |
| (d) Encourage re-use and repair activities | 9 | 12 | 78 | 34 | 2 | **135** |
| (e) Encourage availability of spare parts, instruction manuals, technical information | 5 | 1 | 13 | 10 | 1 | **30** |
| (f) Reduce waste generation in processes related to industrial production, mineral extraction, manufacturing and construction | 10 | 9 | 46 | 16 | 0 | **81** |
| (g) Reduce the generation of food waste | 13 | 3 | 87 | 56 | 0 | **159** |
| (h) Encourage food donation and other redistribution | 6 | 5 | 25 | 10 | 0 | **46** |
| (i) Promote the reduction of the content of hazardous substances in materials and products | 9 | 1 | 20 | 11 | 1 | **42** |
| (j) Reduce the generation of waste not suitable for preparing for re-use or recycling | 4 | 4 | 24 | 11 | 3 | **46** |
| (k) Identify products that are the main sources of littering, take measures to prevent and reduce litter | 23 | 3 | 31 | 12 | 4 | **73** |
| (l) Aim to halt the generation of marine litter | 8 | 1 | 19 | 8 | 0 | **36** |
| (m) Develop and support information campaigns to raise awareness | 0 | 0 | 4 | 112 | 0 | **116** |
| **Total, no** | **109** | **62** | **479** | **366** | **21** | **1,037** |
| Total, % in 2024 | 11% | 6% | 46% | 35% | 2% | 100% |
| Total, % in 2023 | 13% | 6% | 47% | 33% | 1% | 100% |

**Source:** WPPs of EU-27 countries (EEA, 2025).

# Annex 3 Figures and tables from chapter 3 'Preventing food waste in Europe'

**Figure A3.1 Methods used to calculate food waste under Annex IV of EU Delegated Decision (EU) 2019/1597 in 2020 and 2021 respectively, presented by a share of respective data reported by the value chain stage**

**Sources:** Author's compilation based on quality report for the reference years 2020 and 2021.

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