European Environment Agency

The feasibility of additional measures to strengthen reuse and waste prevention

- ***Analysis and reflections by the EEA***

Supporting the European Commission's report to the European Parliament and Council on the review clause contained in Article 9(9) of the Waste Framework Directive

Contents

Executive summary

This study aims to support the European Commission's review under Article 9(9) of the Waste Framework Directive[1] (WFD) due by December 31, 2024. It contributes to the assessment of EU policies on waste prevention and reuse for selected waste streams at both the EU and Member State levels. The study draws on reuse data reported by Member States to the EEA, waste generation data from Eurostat, information on national measures and targets compiled by the EEA, and relevant literature.

The study examines Construction and Demolition Waste (CDW) and Municipal Solid Waste (MSW). Other waste streams (e.g., WEEE, packaging waste) are excluded from the study as they are already or will soon be regulated.

The WFD prioritizes waste prevention and reuse in the waste hierarchy, but waste generation in the EU-27 continues to rise. Challenges include:

- Vague WFD provisions on waste prevention, lacking specific actions, targets, and reporting requirements.
- Reliance on soft measures (e.g., education, voluntary agreements) rather than stronger measures such as targets or economic instruments.
- Consumer preferences for convenience, economic barriers to waste prevention and reuse, and limited business incentives for circular economy models.
- Limited resources for national waste prevention programs, affecting their implementation and effectiveness.

Construction and demolition waste (CDW)

Establishing EU-wide CDW prevention and reuse targets is challenging due to a lack of reliable data baselines. Although Eurostat collects data under the Waste Statistics Regulation, significant variations exist in CDW generation among Member States. Both per capita values of generated CDW and the amounts of CDW per Gross Value Added (GVA) in the construction sector vary largely between Member States, complicating the establishment of clear baselines. Large infrastructure projects are likely to exacerbate these differences, and the aggregation of data makes it impossible to separate infrastructure from buildings-related waste. Improved data collection—distinguishing construction from demolition waste—would require a revision of the Waste Statistics Regulation or a separate CDW reporting requirement, allowing a more accurate evaluation of current prevention measures.

Binding reuse targets for CDW are premature due to limited and inconsistent data on reused materials. The Implementing Decision (EU) 2021/19 requires Member States to report on construction materials, but varied methodologies hamper a clear baseline for target setting. Supporting consistent data collection across Member States and providing platforms for sharing best practices could improve data quality. If quality does not improve by the next reporting cycle in 2026, a revision of reporting requirements with clearer data quality standards may be needed.

[1] The Waste Framework Directive sets the basic concepts, definitions, and requirements for waste management, aiming to protect the environment and human health through sustainable waste treatment and prevention practices

In the meantime, EU-wide measures to promote CDW reuse, and prevention offer a feasible next step. Mandatory pre-demolition audits, selective demolition practices, Extended Producer Responsibility (EPR) for construction materials, and Green Public Procurement (GPP) criteria, could provide a more robust framework.

Pre-demolition audits can identify reusable building elements and ensure that hazardous materials are kept separate during demolition. GPP can stimulate demand for reused building materials and encourage decisions that favour renovation over demolition, as well as the selection of materials with fewer hazardous substances. This approach prevents hazardous waste from being generated during construction and later demolition. While EPR has traditionally focused on waste management, recent developments are broadening its role to support prevention goals. For example, eco-modulation fees can incentivize the choice of more sustainable materials, while EPR fees can fund reuse initiatives.

Several of these measures are already implemented at the national level and could serve as models for broader EU adoption. The EU's existing (voluntary) GPP criteria for road design, maintenance, and office building construction are examples that could be expanded.

Municipal Solid Waste (MSW)

Setting mandatory quantitative targets for municipal solid waste prevention aligns with the EU's Circular Economy Action Plan, which has the ambition to halve non-recycled MSW. It also reflects public support for waste reduction and resource efficiency, as demonstrated by Eurobarometer 550.

While several Member States have set MSW prevention targets, an EU-level target could enhance efforts to prevent waste streams like garden waste, bulky items, WEEE, and textiles. A 2025 base year may be suitable, considering the new MSW definition in the 2018 Waste Framework Directive.

Most MSW targets already put in place in Member States are based on waste generated per capita, a viable metric for EU-level adoption. Alternatively, a combined target on the per capita amount of residual (non-recycled) MSW, aligning with the EU's Circular Economy Action Plan, could also offer flexibility, allowing Member States with varied recycling and waste generation rates to focus on areas where they can make the most impact.

Given the inconsistency in reuse data for textiles, EEE, and furniture, setting a binding reuse target for MSW is premature. Harmonizing data collection methods is crucial before advancing any targets. An upcoming EEA project in 2025 aims to improve reuse data quality and identify effective practices among Member States.

Until robust reuse data becomes available, harmonized EU measures supporting eco-design and mandatory reuse reporting are critical. The Ecodesign for Sustainable Products Regulation (ESPR) will introduce Digital Product Passports and enhance product durability, aiding reuse and repair. Other legislative updates, like the proposed Regulations on End-of-Life Vehicles and Packaging and Packaging Waste, demonstrate feasible reuse provisions and could serve as models for upcoming revisions of related directives, like the WEEE Directive.

1 Objective, scope and methodology

This study aims to support the European Commission's review under Article 9(9) of the Waste Framework Directive[2] (WFD) due by December 31, 2024. It contributes to the assessment of EU policies on waste prevention and reuse, both at the EU level and within Member States, for selected waste streams. The assessment is based on the reuse data reported by Member States according to the implementing decision (EU) 2021/19. Data on national re-use and waste prevention targets, as well as implemented measures by the 27 EU Member States and some additional European countries, is sourced from the EEA's country profiles on waste prevention. Waste generation data is obtained from Eurostat.

> By 31 December 2024, the Commission shall examine data on re-use provided by Member States in accordance with Article 37(3) with a view to considering the feasibility of measures to encourage the re-use of products, including the setting of quantitative targets. The Commission shall also examine the feasibility of setting other waste prevention measures, including waste reduction targets. To that end, the Commission shall submit a report to the European Parliament and to the Council, accompanied, if appropriate, by a legislative proposal.
>
> *The review clause text in the WFD*

This study focuses on two key waste streams: Construction and Demolition Waste (CDW) and Municipal Solid Waste (MSW). CDW is included due to its substantial impact, representing around 39% (in weight) of total EU waste (including soils and dredging spoils) and often containing hazardous materials like asbestos, which pose significant risks to health and the environment. It is also prioritized in the Scoping study to assess the feasibility of further EU measures on waste prevention[3] ,the Circular Economy Action Plan[4] and the Zero Pollution Action plan[5] . MSW is selected for its high visibility among citizens, its varied and complex composition, its prominent role in national waste prevention programs and its considerable potential for improvement through targeted measures for some product groups like textiles, furniture and packaging.

This study excludes other waste streams, such as Waste Electrical and Electronic Equipment (WEEE), tyre waste, End-of-Life Vehicles (ELVs), packaging waste and batteries. This is because these waste streams are either already regulated under existing legislation or will be under forthcoming legislation. Further waste streams are excluded because there is insufficient data available to analyse them effectively within the scope of this study, such as industrial and agricultural waste. Detailed explanations for these decisions are provided in Annex 1.

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[2] The Waste Framework Directive sets the basic concepts, definitions, and requirements for waste management, aiming to protect the environment and human health through sustainable waste treatment and prevention practices

[3] European Commission: Directorate-General for Environment, Karigl, B., Neubauer, C., Kral, U., Tesar, U. et al., Scoping study to assess the feasibility of further EU measures on waste prevention – Final report, Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2779/21588

[4] The EU Circular Economy Action Plan is a comprehensive strategy aimed at promoting sustainable resource use, reducing waste, and fostering a transition to a regenerative economic model through measures that target the entire lifecycle of products.

[5] The EU Zero Pollution Action Plan aims to reduce air, water, and soil pollution to levels that are no longer harmful to human health and ecosystems by 2050, integrating pollution prevention into all EU policies

2 Why waste prevention?

Preventing waste is crucial in addressing the triple planetary crises of climate change, biodiversity loss, and pollution. Waste prevention reduces the extraction of raw materials, manufacturing, transportation and its associated carbon emissions. It also preserves natural habitats, which are often negatively impacted during resource extraction, thereby safeguarding biodiversity. Moreover, it contributes to the EU's strategic autonomy and security of materials supply.

In this study, the definitions from the Waste Framework Directive are being used:

"'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."

"'re-use' means any operation by which products or components that are not waste are used again for the same purpose for which they were conceived."

Waste generation disproportionately impacts people living in vulnerable situations, as they often reside in areas with higher exposure to pollution and environmental degradation or close to waste management facilities. These communities face greater health risks, economic instability, and limited access to clean resources due to the concentration of waste and industrial activities near their homes. Waste prevention can contribute to alleviate these disparities by reducing the hazardous materials released into the environment, leading to cleaner air, water, and soil. An overall lower environmental burden in turn improves living conditions and health outcomes for vulnerable populations.

Reuse plays a pivotal role in waste prevention. By reusing products and parts of products, their useful lifetime is extended, thereby potentially reducing waste. Reuse is generally a more environmentally sustainable option than recycling. Moreover, it offers socio-economic benefits; for example, small businesses centred around upcycling, repurposing, or selling second-hand products create employment opportunities. Studies show that job creation varies significantly between reuse and waste management options lower in the waste hierarchy, with re-use offering the highest potential. For every 10,000 tonnes of waste, incineration creates only 1 job, while re-use can create between 300-800 jobs as demonstrated by Belgian re-use network Komosie,[6]. A study from GAIA estimates that "zero waste practices", like reuse, can generate over 200 times more jobs per 10,000 tons of waste than conventional disposal methods like incineration or landfilling, highlighting the significant job creation potential of re-use strategies[7] . Additionally, reuse provides access to products for disadvantaged individuals and small businesses.

While recycling plays a crucial role in the transition to a circular economy by securing access to secondary materials and reducing the demand for virgin ones, it is not sufficient on its own to address the triple planetary crises. Recycling processes themselves consume energy and can

[6] Re-use has higher employment potential than recycling | RREUSE

[7] Zero Waste and Economic Recovery - GAIA (no-burn.org)

generate pollution, and they often downcycle materials, resulting in lower-quality materials and products that eventually become waste. Therefore, efforts to reduce and reuse should be maximised before the recycling option, in line with the Union's waste hierarchy.

Addressing waste prevention and reuse requires a fundamental shift in production processes, business models, consumer behaviour, and reuse practices. This includes creating incentives to reduce material consumption, promoting the design of durable and repairable products, and supporting systems that make it easier to reuse products and parts.

3 State of waste prevention and reuse in the EU 27 Member States

EU policies on waste prevention

EU policies emphasize waste prevention and reuse as priority strategies in waste management. The Waste Framework Directive (WFD) puts these approaches at the top of the waste hierarchy. The responsibility for implementing specific waste prevention measures largely falls to Member States, which are required to develop waste prevention programs to reduce waste generation and encourage reuse. Despite this priority and the existence of national waste prevention programs for ten years, waste generation in the EU-27 Member States continues to rise, highlighting challenges in fully implementing and achieving these policy goals.

There are several reasons for this:

- While the WFD includes concrete provisions to improve waste management, such as specific recycling targets and obligations for separate collection of certain waste streams, its provisions on waste prevention remain relatively vague. These provisions do not specify concrete actions, and lack quantified targets, deadlines for implementation, and specific reporting obligations. For example, the minimum requirements for extended producer responsibility (Article 8a WFD) mandate setting targets for waste management but not for waste prevention.

- Many waste prevention programs rely mainly on soft policy measures, such as educational campaigns and voluntary agreements which may be less effective than enforceable regulatory approaches. These softer measures depend on persuasion and encouragement rather than legal obligations, which may limit their overall impact.

- Furthermore, consumer habits often favor convenience and disposability, while economic factors, such as high upfront costs and the perceived expense of sustainable products, can hinder both individuals and businesses from adopting sustainable practices like reuse.

- Businesses may lack sufficient incentives or support to transition to circular economy models. Without clear financial benefits or regulatory pressures, companies might not prioritize waste prevention.

- Additionally, limited financial and administrative resources can limit the development, monitoring, update and general effectiveness of national waste prevention programs, thereby reducing their reach and impact.

The Circular Economy Action Plan (CEAP) promotes designing durable products and reducing waste through reuse and repair initiatives, for example via the Ecodesign for sustainable products regulation (ESPR) and the Right to Repair directive. Other legislation, such as the Batteries Regulation and the proposal for the revision of the End-of-Life Vehicles (ELV) Directive targets specific waste streams by setting requirements for the products' lifetime extension and fostering circular practices. The Single-Use Plastics Directive focuses on eliminating or reducing certain plastic products to prevent waste at the source. Additionally, upcoming measures—including the ESPR related work programme, the Packaging and Packaging Waste Regulation and the proposal for a targeted amendment to the Waste Framework Directive as regards to textiles and food, aim to design products to reduce waste generation, and increase reuse. However, data on the impact of these recent initiatives is not yet available.

No absolute decoupling between economic growth and waste generation in the EU 27 Member States

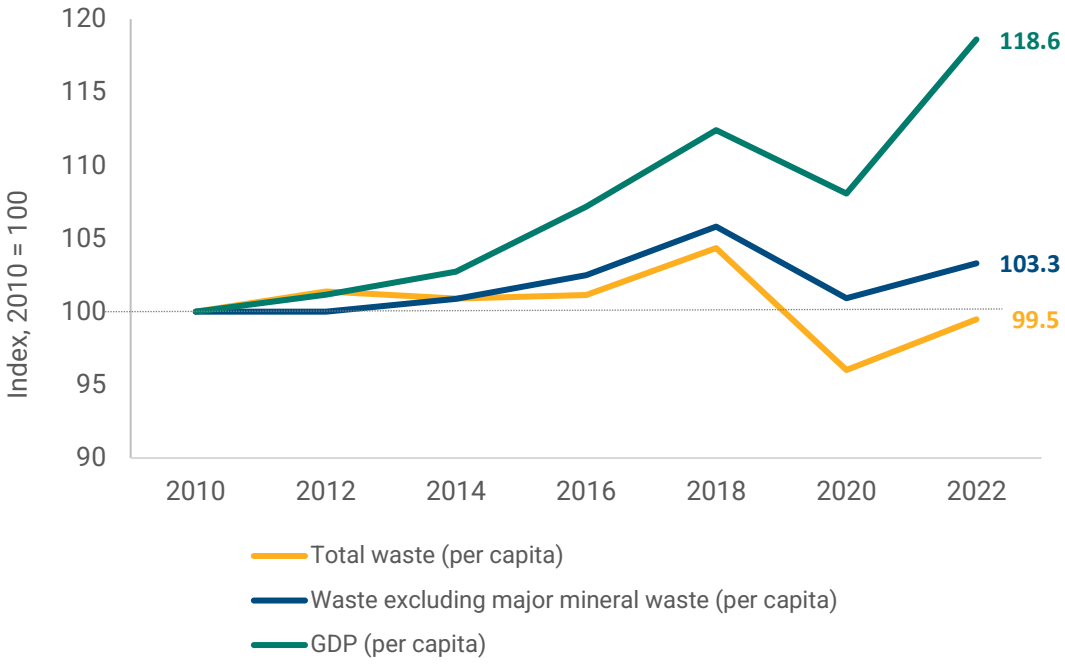
In 2022, total waste per capita generated in the EU was back at around the same level as in 2010, after a drop in 2020 which was most likely due to the Covid-19 outbreak. This is strongly influenced by a decrease in 'other mineral wastes' from mining activities, partly offset by an increase in excavated soils. Identifying the reasons for these changes would need further in-depth analysis.

However, around 64% of all waste consists of mineral waste of less environmental relevance, mainly generated in the mining sector and construction and demolition activities. If these mineral wastes are excluded, per capita total waste (excluding major mineral waste) in the EU-27 increased by 3.3%, while per capita GDP grew by 19.1% (Figure 2). This indicates a modest relative decoupling between waste generation and economic growth, though not absolute decoupling.

Figure 1 Development of generated waste amounts in the EU 27

Source: EEA based on Eurostat, 2024a

Figure 2 Trend in waste generation vs. economic development



Source: EEA, based on Eurostat, 2024a and Eurostat, 2024b

Reporting on waste prevention

Article 9(3) of the Waste Framework Directive (WFD) mandates that Member States monitor and assess the implementation of waste prevention measures using appropriate qualitative or quantitative indicators, particularly focusing on the quantity of waste generated. Additionally,

Article 9(7) stipulates that the European Commission is to adopt implementing acts that establish indicators for measuring progress in waste prevention and a common methodology for reporting on product reuse, with an initial deadline set for March 31, 2019. However, it is important to note that these two provisions are not legally linked, which means that Member States are not explicitly required to utilize the indicators outlined in Article 9(7). This disconnect may impact the consistency and effectiveness of waste prevention reporting across the EU.

In 2023, the European Environment Agency (EEA) introduced a narrative based indicator framework designed to monitor waste prevention at the EU level [8]. The report presents a comprehensive framework for assessing waste prevention efforts across the EU, organized into three clusters of indicators:

The framework consists of three clusters of in total 17 indicators:

1. the system where prevention is implemented
2. policy enablers focusing on waste prevention measures, and
3. waste prevention outcomes.

Given that waste prevention occurs over time, the framework seeks to assess longer term trends in waste prevention.

The framework will be used to assess EU-level progress in waste prevention, with findings presented in the upcoming EEA waste prevention report, scheduled for publication in April 2025. Additionally, it will be integrated into the EEA's Circularity Metric Lab (CML) to monitor waste prevention as a critical component of the transition to a Circular Economy. The CML uses a range of sources such as European datasets, national statistics, surveys, and novel dataflows to provide insights on progress towards the development of the circular economy. It is intended to complement other monitoring frameworks by presenting additional evidence on circularity, including metrics focussed on the implementation of circular principles and practices.

Reliable data on reuse is lacking

Currently, the EU Waste Statistics Regulation does not require the reporting of data specifically on reuse (nor on preparing for reuse). Despite the data available through Eurostat being extensive on waste generation, recycling, and other waste management activities, detailed and harmonized data on reuse is not consistently available at the EU level through regular waste statistics.

Several directives include reporting requirements that touch on reuse or preparing for reuse, either alone or combined with recycling:

- The **WEEE Directive** requires reporting on preparing for reuse, starting from the reference year 2021.
- The **ELV Directive** mandates reporting on reuse in terms of total dismantling and de-pollution, while reporting reuse data for individual parts is voluntary. The Commission proposal for the revision of the Directive includes a new reporting requirement on the total amount and weight of parts, components, and materials removed from ELVs for reuse, remanufacturing or refurbishment, recycling, recovery, and disposal.
- The **Waste Framework Directive (WFD)** allows for voluntary reporting on preparing for reuse of municipal waste but requires mandatory reporting when it combines preparing for reuse with recycling.

[8] Tracking Waste Prevention Progress — A Narrative-Based Waste Prevention Monitoring Framework at the EU Level

New data set on reuse for textiles, electrical and electronic equipment (EEE), construction materials and products, and furniture

In accordance with Articles 9(4) and 37(3) WFD and Implementing Decision (EU) 2021/19, EU Member States are required to report data on the reuse of textiles, electrical and electronic equipment (EEE), construction materials and products, and furniture, as well as measures and policies implemented to enhance reuse for these product categories. Member States are required to report quantitative data every three years and qualitative data annually. In 2023, Member States provided both quantitative and qualitative data to the European Environment Agency for reference year 2021. In 2024, the reporting focused only on measures for the reference year 2022. This initial reporting cycle marks the beginning of efforts to assess and quantify reuse activities. While data quality is anticipated to improve over time, current data should be interpreted with caution.

When reporting on reuse measures, the Member States should indicate the public authorities responsible for their adoption and implementation, the targeted products, affected reuse operators, and actions taken to assess reuse through indicators and targets.

The reuse reporting must also include measures that Member States have implemented to support reuse operators, such as economic incentives and educational campaigns. Measures reported are categorized as follows:

Logistic measures: Support for reuse operations, addressing barriers, improving collection models, and enhancing logistics.

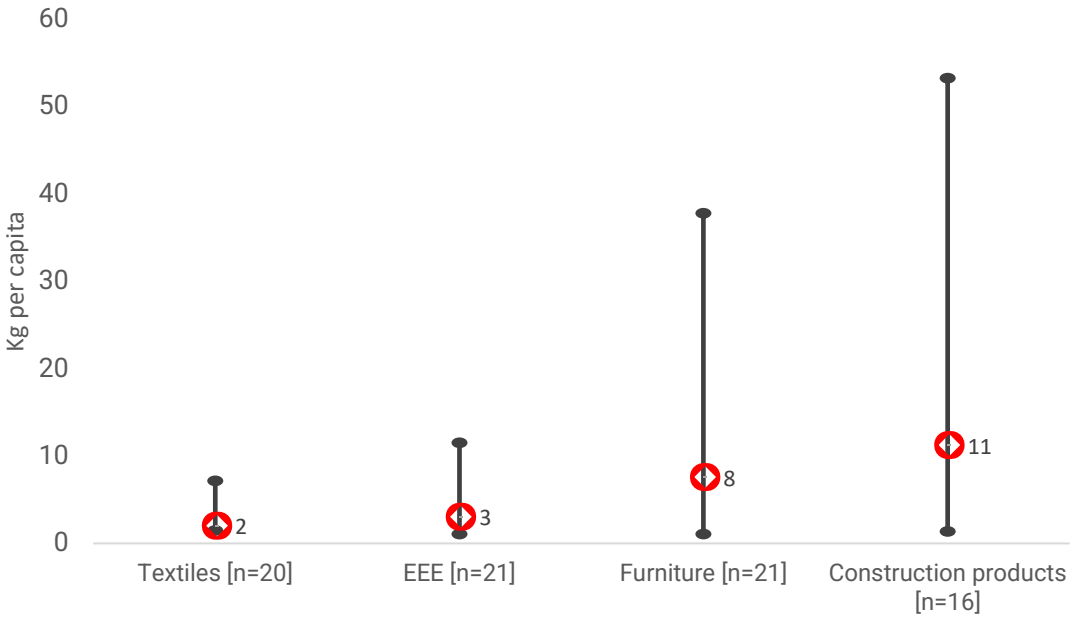
Economic and fiscal measures: Economic incentives and public procurement actions that promote reuse.

Educational measures: Information and awareness campaigns, detailing target groups, coverage area, and frequency.

Other measures: Establishment and support of accredited repair and reuse centres, networks, and innovative business models like sharing schemes, repair, and remanufacturing

Figure 3 and Figure 4 summarise the results of the first reporting.

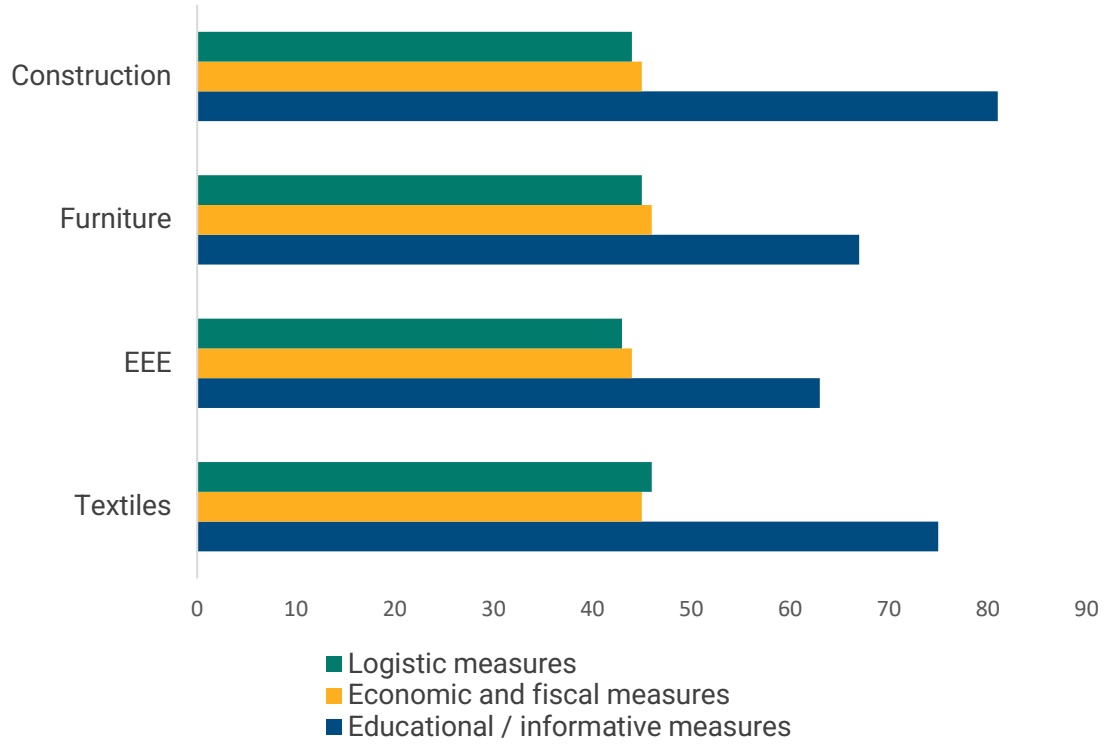
Figure 3 Average reported per capita reuse amounts in EU Member States (reference year 2021)



Source: EEA, 2023d.

Figure 3 displays the average per capita reuse amounts (in kg) across EU Member States, broken down into four categories: textiles, electrical and electronic equipment, furniture, and construction products. Each category also shows the range (from the lowest to the highest reported value) across countries, represented by the vertical lines. Categories like Furniture and Construction Products have significantly larger ranges, meaning that there is a wide disparity in reuse practices across EU Member States for these items, while categories like Textiles have more consistent values, with little variation. Construction products have the highest average reuse (11 kg) while Textiles have the lowest (2 kg), due to the differences in the size and wight of products within each category.

Figure 4 Number of Reuse measures implemented in the EU-27 Member States for each product category (Reference Year 2022).[9]



Source: Data compiled from reuse reports submitted to the EEA in 2024.

Figure 4 shows the reuse measures implemented for the four different product categories and are categorised into three types: Logistic measures, Economic and fiscal measures, and Educational/informative measures. The values indicated represent the number of measures reported in each category. Across all categories, educational/informative measures consistently have the highest number of measures reported. Logistic and economic measures are balanced across all categories but are notably lower than educational/informative measures.

The reporting process is still in its early stages, with methodologies for data collection continuing to evolve. Despite this, the data already offer valuable initial insights into reuse activities across EU Member States. As the process matures and data collection becomes more standardized, this data stream is expected to provide evidence on reuse initiatives.

[99] It is important to note that Member States had the flexibility to choose their own reporting methods, resulting in a diverse range of approaches. Consequently, the dataset reflects varied methods, which hampers reliable inter-country comparisons.

4 Construction and demolition waste

What is it and why is it important to prevent?

Construction and demolition waste (CDW) consists of materials generated from the construction, renovation, and demolition of buildings and infrastructure. It includes a variety of materials such as concrete, wood, metal, glass, as well as hazardous substances, which can pose environmental and health risks if not managed properly.

Construction and demolition waste represents about 39% of the waste generated in EU, or 16% if soils and dredging spoils are excluded. In 2022, the EU-27 generated 353 million tonnes of CDW (excluding soils and dredges), making it one of the largest waste streams in the EU by weight, after extractive waste and excavated soil (calculated based on data from Eurostat, 2024a). This total includes waste from the construction and demolition of buildings, infrastructure projects, and road planning and maintenance.

Life Cycle Assessment studies indicate significant environmental benefits of preventing construction and demolition waste. A study by JRC shows that CDW prevention leads to substantial reductions in greenhouse gas emissions and resource depletion compared to recycling or landfilling (JRC, 2024. Reusing concrete in particular can significantly lower emissions due to the high energy and carbon costs associated with its production.

A recent study from the EEA shows that waste prevention including renovation, particularly through material-efficient construction and increased reuse of building components, offers the most significant potential to reduce overall environmental impacts from the building sector. (EEA, 2024).

Several studies also highlight the presence of hazardous substances in CDW. It often contains materials like asbestos, lead, PCBs, and mercury, which pose significant environmental and health risks if not properly managed (EEA, 2020).

4.1 Policy context

The Waste Framework Directive regulates the management of construction and demolition waste (CDW) in the EU.

It mandates Member States to:

1. Reduce waste generation in industrial processes, including construction and demolition, using best available techniques (Article 9).
2. Promote selective demolition to safely handle hazardous substances, enable reuse, and ensure high-quality recycling by establishing sorting systems for materials like wood, concrete, metal, glass, plastic, and plaster (Article 11(1)).
3. Achieve a minimum of 70% by weight of non-hazardous construction and demolition waste to be prepared for reuse, recycled, or recovered by 2020 (Article 11(2b))

The EU as a whole currently exceeds the quantitative target with an average recovery rate of about 89% (JRC, 2024). However, much of this recovery relies on low-quality recycled aggregates primarily used for backfilling or road construction, while the reuse of building elements such as bricks, pipes, and wood remain rare. To address these challenges, the European Commission has issued guidance documents such as the Construction and Demolition Waste Management Protocol and principles for effective CDW management. The guidelines outline a systematic approach for assessing the types and quantities of materials present in construction and demolition projects. These efforts align with the EU's Circular Economy Action Plan and the Soil Strategy for 2030, promoting sustainable and circular use of CDW and excavated soil. The effect of this guidance on the quality of recycled aggregates remains to be seen.

The EU Construction and Demolition Waste Protocol focuses on improving the management and recycling of CDW, aiming to enhance the quality and efficiency of recycling processes. While it primarily targets increasing recycling rates and building confidence in recycled materials, it indirectly supports waste prevention through improved identification, separation, and logistics, potentially also identifying building elements that could be reused. However, the protocol does not explicitly detail specific waste prevention or reuse strategies, concentrating instead on enhancing recycling quality and addressing related challenges.

The Renovation Wave strategy is another policy that might influence EU waste prevention goals. The objective is to at least double the annual energy renovation rate of residential and non-residential buildings by 2030 and to foster deep energy renovations. However, the focus of this strategy is primarily on improving energy efficiency rather than broad renovations. This raises the question of whether energy renovation can extend the life of buildings and contribute to waste prevention. While energy renovations can indeed lead to a longer lifespan for buildings, this effect is more of a side benefit rather than the primary aim. The main goal is energy savings and emissions reductions, with waste prevention potentially occurring in a more limited capacity as a secondary outcome. The overall impact on waste reduction largely depends on how renovation efforts incorporate material reuse, deconstruction strategies, and the overall life cycle of building materials

While the EU's policies do address the hazardousness of CDW, they are more focused on managing hazardous waste once it has been generated, rather than preventing it at the source. The Waste Framework Directive and related policies primarily emphasize the treatment, recycling, and safe disposal of CDW, including hazardous components, rather than strictly preventing hazardous waste generation. Efforts like the Circular Economy Action Plan and Green Public Procurement indirectly contribute to prevention by encouraging the use of sustainable and less hazardous materials in construction, but these are more about reducing the impact of waste rather than preventing hazardous waste entirely. The proposed revision of the Construction Products Regulation creates the framework for setting sustainability criteria for construction products, including reducing hazardous substances in construction products, and will therefore contribute to reducing hazardous waste at the source.

There are several EU-funded projects that focus on promoting sustainability and circular economy practices in the construction sector:

The Interreg KARMA project aims to make the construction industry more sustainable by encouraging the use of circular economy practices. It involves collaboration between five European countries (Germany, Belgium, Hungary, Italy and Romania) to improve how resources are used, managed, and recycled in construction. KARMA focuses on changing

policies to support the reuse and repurposing of building materials, offering guidance to professionals and policymakers to adopt these practices at different levels. One of the main objectives of the project is to promote sustainability and resource efficiency, by reducing this construction waste and ensuring that materials are reused instead of discarded.

The RE4 Project focuses on developing prefabricated building elements using recycled materials from demolition waste. RE4 aims to create structures that can be easily dismantled and reused, thereby promoting a circular economy in the construction industry.

The Buildings as Material Banks (BAMB) aims to create a circular building industry by developing materials passports and reversible building design. The project seeks to make buildings adaptable and flexible, so materials can be reused rather than wasted at the end of a building's life cycle.

The Cinderela Project focuses on developing a new circular business model for more sustainable urban construction. It promotes the use of secondary raw materials, turning waste from construction and demolition into new resources.

4.2 Development of construction and demolition waste amounts

Art. 3(2c) of the WFD defines construction and demolition waste as waste generated by construction and demolition activities. For calculating compliance with the recycling target according to Art. 11(2b) WFD, the amount of construction and demolition waste is calculated by adding up the following wastes, from the data reported under the EU Waste Statistics Regulation (EC/2150/2002) :

- wastes generated by the construction sector (NACE sector F):
  - metallic waste, ferrous
  - metallic waste, non-ferrous
  - metallic waste, mixed
  - glass waste
  - plastics
  - wood
- mineral construction and demolition waste from all economic sectors

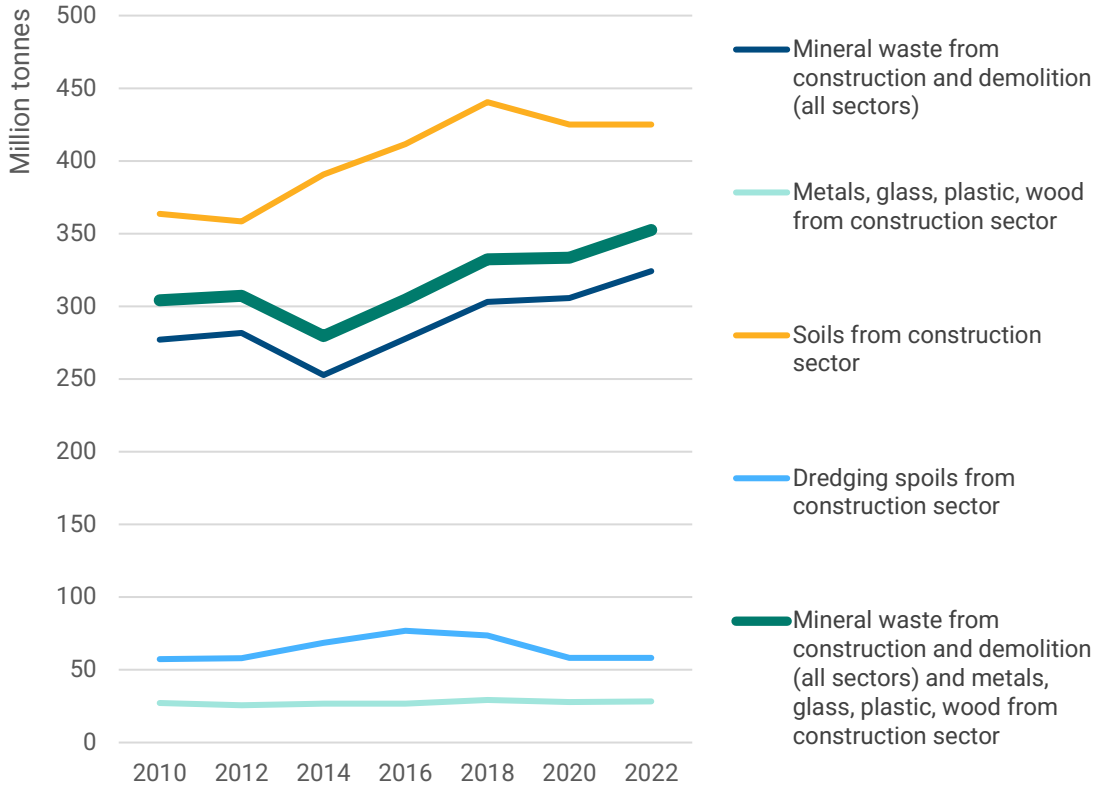
Other major waste types generated in construction and demolition activities include soils and dredging spoils. If soils and dredging spoils are excluded, metals, glass, plastics and wood make up around 8 % of the construction and demolition waste (calculated based on data from Eurostat, 2024c). Construction and demolition waste (mineral, metals, glass, plastic, wood) increased by 16% over the period 2010-2022, while the GVA of the construction sector decreased by 3.3 % over the same period[10]. The amount of excavated soil increased as well considerably (Figure 5).

For the EU, no regular breakdown data exist about how much of the CDW originates from demolition, renovation and construction of new buildings, and how much comes from infrastructure projects, respectively. In Norway, surveys done between 2009 and 2021 show that approximately 26% of CDW originated from construction activities, 33% from renovation projects, and 41% from demolition (SSB, 2022). A study using material flow analysis estimated

[10] Eurostat, National accounts aggregates by industry (up to NACE A*64), nama_10_a64

the outflows of waste from renovation and demolition across the EU, considering building types, ages, and regional differences (JRC, 2024). Concrete emerged as the dominant material in CDW, with its outflow ranging from around 38% in Northern Europe to 61% in Western Europe. Other materials like wood, brick, steel, and plastic also contribute to the waste stream, with variations across regions (JRC, 2024). During the construction phase, over 10% of construction products used are wasted (EEA, 2024b).

Figure 5 Trend in construction and demolition waste generated in the EU-27



Source: EEA based on Eurostat dataset Generation of waste, by waste category, hazardousness and NACE Rev. 2 activity (env-wasgen)

Mineral waste from construction and demolition varies significantly by country, ranging from 64 kg per capita in Romania to 3,770 kg per capita in Malta in 2022—a difference of 59 times (Figure 12 in the Annex 2). Similarly, the generation of mineral waste from construction and demolition per economic activity in the construction sector varies from 59 tonnes per million EUR in Romania to 2626 tonnes per million EUR in Malta, a difference of 44 times in 2022 (Figure 13 in Annex 2). While such wide variation in waste generation among Member States likely reflects differences in construction activities and practices, an analysis conducted for Eurostat (IECDD and Argus, 2024) indicates that these discrepancies are also influenced by differences in data reporting. The analysis further suggests that the allocation of mineral waste to the categories 'mineral waste from construction and demolition' and 'other mineral waste' is not fully harmonized across Member States, contributing to these significant differences. Moreover, the data includes both waste from buildings and from infrastructure projects. Large infrastructure projects generating large amounts of waste over a temporary period, might also be responsible for large differences in waste generation between MS.

There are also significant differences in the per capita amounts of excavated soils from the construction sector, ranging from less than 100 kg per capita in 5 Member States to over 1,800 kg per capita in 5 others (calculated based on data from Eurostat, 2024a). Uncontaminated excavated soils from construction activities are excluded from the scope of the Waste Framework Directive (WFD) and from reporting under the Waste Statistics Regulation when it is certain that the material will be used for construction purposes in its natural state on the site from which it was excavated. However, the interpretation of "on the site from which it was excavated" appears to be challenging, leading to varying interpretations across Member States, which could contribute to the large variations in reported amounts of excavated soils (IECDD and Argus, 2024).

4.3 Overview of waste prevention and reuse measures and targets in Member States

Measures to prevent CDW

EU Member States have implemented various measures to prevent CDW. Extended Producer Responsibility (EPR) schemes are in place in some countries like France and the Netherlands making producers accountable for the lifecycle of construction materials. However, these schemes often focus more on waste management rather than on prevention and reuse.

Several EU Member States have developed building codes and standards to encourage sustainable practices and waste prevention in the construction sector. Germany's Building Code and the DGNB standards focus on sustainability and efficient resource use. France's RT 2012 and RE 2020 regulations emphasize energy efficiency and construction waste reduction. The Netherlands' Building Decree and BREEAM-NL certification promote sustainable building practices, including waste prevention. Sweden's Building Code (BBR) and Miljöbyggnad certification, Denmark's Building Regulations, that stems from adapting the German DGNB, and Austria's ÖNORM B 5010 also include provisions for sustainable construction and waste prevention.

Some EU Member States have implemented economic instruments to prevent construction and demolition waste and promote reuse. For instance, Denmark imposes high landfill taxes to discourage waste disposal and thereby encourages reuse. Belgium (Flanders) provides subsidies for projects that focus on the reuse of construction materials. Additionally, Sweden promotes green public procurement, requiring the use of reused materials in public construction projects, thus incentivizing prevention and reuse.

Several EU Member States have implemented training and awareness programs aimed at educating construction professionals and the public about best practices in reducing construction and demolition waste. In the Netherlands, the government supports initiatives that train construction professionals in sustainable practices, including waste reduction and material reuse. Germany has launched programs to raise awareness among industry professionals about circular economy principles, emphasizing resource efficiency and waste prevention. Austria offers educational campaigns and training programs focused on sustainable construction and material reuse, targeting both the public and industry professionals. Similarly, Sweden and Finland have developed initiatives to educate construction workers and companies on best practices for minimizing waste and promoting the reuse of materials.

Measures to increase reuse of construction materials and products

The EU Member States have implemented various measures to increase the reuse of construction materials and products.

Modular and adaptable designs, which allow for easier repurposing and disassembly, are examples of measures when designing a building. These approaches can have long-term benefits, as prevention measures taken at the new building stage can lead to substantial reductions in waste over the building's life cycle. This long-term effect is particularly important due to the typically extended lifespan of buildings.

Other examples include *mandatory pre-demolition audits* that assess reusable building elements and materials before demolition. Flanders, one of the regions of Belgium, has been a pioneer in this area. Since 2012, it has required mandatory demolition audits for certain types of buildings before they can be demolished. The audit identifies materials that can be reused or recycled. Various municipalities in the Netherlands have implemented policies requiring pre-demolition audits. For instance, Amsterdam mandates pre-demolition audits to ensure that materials are reused or recycled. Furthermore, France introduced the concept of a "resource diagnosis" (diagnostic resources) with the Anti-Waste for a Circular Economy Law. As of January 2021, it is mandatory to conduct an audit before demolishing buildings over a certain size (1,000 square meters) to identify materials that can be reused or recycled. Denmark is another country with a focus on circular economy practices in the construction sector with municipalities requiring deconstruction audits, particularly for larger buildings, to identify materials that can be reused.

Material exchange platforms and *material banks* facilitate the trade and storage of used materials. *Awareness campaigns* and *training programs* aim to educate industry professionals on reuse practices. Additionally, *research funding* and support for *pilot projects* help develop innovative construction methods that prioritize reuse. Lastly, *selective demolition practices* and the use of *Building Information Modelling (BIM)*[11] strengthens reuse.

Several countries have implemented financial incentives to promote projects focused on material reuse in construction. Germany offers grants and subsidies through KfW Bank for projects emphasizing resource efficiency, including the use of reused materials (EEA, 2022). In France, the French Environmental Code provides tax exemptions for companies that invest in deconstruction and reuse initiatives, while local governments may also offer grants for sustainable building projects (EU, 2020a). Belgium supports the use of recycled materials in construction through various regional subsidies aimed at encouraging sustainable practices. The Netherlands also provides grants for projects prioritizing the use of reused materials (EEA, forthcoming).

Several EU Member States have integrated Green Public Procurement (GPP) policies that prioritize reused materials in public construction projects. The Netherlands' "Circular Procurement Green Deal" and Belgium's regional policies in Flanders and Brussels promote sustainability by favouring reused and recycled materials. France's 2020 Anti-Waste Law mandates consideration of material reuse in public contracts. Denmark, Sweden, Finland, and Austria have all integrated strong Green Public Procurement (GPP) criteria to support the

[11] Building Information Modelling (BIM) is a digital process that involves creating and managing detailed 3D models of buildings throughout their lifecycle, from design to demolition. It enhances collaboration, material tracking, and planning, enabling more efficient and sustainable construction practices.

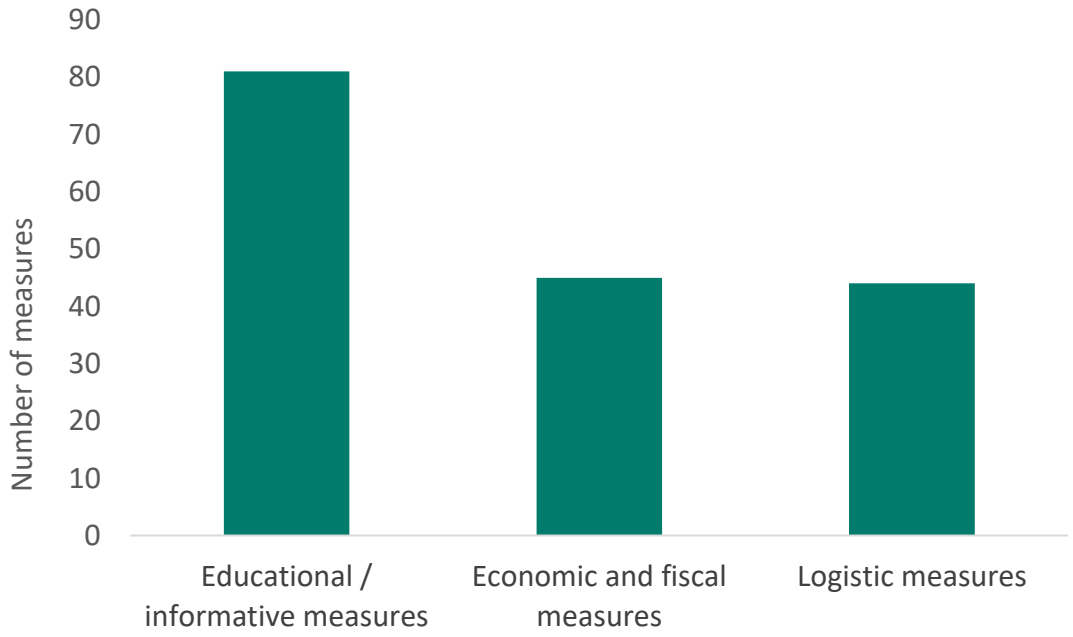
circular economy by encouraging the use of reused and recycled materials in construction. Denmark's Action Plan for the Circular Economy emphasizes sustainable procurement practices, urging public institutions to prioritize circular materials in their projects (ETC CE, 2022).

Green Public Procurement (GPP) in Denmark is driving a transformation in the construction industry. Architectural firms are at the forefront of the circular economy movement, advocating for the incorporation of recycled materials into new buildings, leading the reuse and repurposing of end-of-life structures, and revitalizing them with innovative designs. These firms are also pioneering the development of community and shared spaces that prioritize energy-efficient use of resources and space (Lima, A., 2024).

Similarly, Sweden's National Strategy for a Circular Economy outlines how GPP can drive demand for sustainable materials, focusing on material reuse and recycling (Swedish Government, 2020). Additionally, Austria's Action Plan for Circular Economy highlights GPP as a vital tool for promoting sustainable construction practices by encouraging the procurement of reused and recycled materials (Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, Austria, 2020).

Most measures to promote reuse that MS have reported to the EEA fall in the category informational/educational (Figure 6).

Figure 6 Number of reported reuse measures for construction materials and products implemented in the EU 27 Member States and reported to the EEA



Source: From the reporting to EEA in 2024

Targets to prevent CDW in MS's national plans and programmes

Out of the EU 27 MS, only France has established a national target focused on reducing construction and demolition waste. The target aims to decrease waste generated from

economic activities per unit of value produced, specifically in the building and public works sector, by 5% by 2030 compared to 2010 levels.

The Netherlands has a broader goal of achieving a fully circular economy by 2050, with intermediate targets for 2030 - A Circular Economy in the Netherlands by 2050 (europa.eu) Within this framework, the construction sector is expected to reduce primary raw material consumption by 50% by 2030, which directly contributes to the prevention of CDW. The strategy includes designing buildings for longevity, reuse, and recycling, thereby preventing waste from the outset.

Germany's Resource Efficiency Programme program (ProgRess III) emphasizes the prevention of waste through resource efficiency. In the construction sector, the policy promotes designing buildings with fewer materials, using alternative and recycled materials, and extending the lifespan of buildings. The program sets a target to decouple resource use, including CDW, from economic growth by 2030.

Reuse targets in MS's national plans and programmes

France's Extended Producer Responsibility (EPR) scheme for Construction and Demolition Waste that entered into force on July 1, 2022, aims to enhance sustainability in the construction sector. As part of this initiative, the scheme sets a quantified reuse target of 10% of the total volume of CDW generated by 2025, encouraging the adoption of more circular practices (EEA, forthcoming).

The Netherlands' Extended Producer Responsibility (EPR) scheme for Construction and Demolition Waste mandates that producers take responsibility for the lifecycle management of construction materials, promoting sustainability and waste reduction. Under this framework, a reuse target of **5%** and a recycling target of **75%** for CDW are set for 2025, encouraging circular economy practices within the construction sector. Producers must register with a designated organization, contribute to waste management efforts, and report on the quantities of materials they place on the market.

These are the only quantitative targets specifically aimed at increasing reuse of CDW in the EU 27 MS's national plans and programmes. The other targets in place cover both recycling and (preparing for) reuse, reflecting the target set in Art. 11 of the WFD.

4.4 Reflections on the feasibility of setting effective EU targets and additional measures for prevention and reuse of Construction and Demolition waste

Despite efforts to reduce construction and demolition waste, Member States have yet to achieve significant progress. National policies have largely failed to steer these efforts toward meaningful waste reduction. The growing volume of construction and demolition waste, combined with an inadequate response to Article 9 of the Waste Framework Directive, emphasizes the urgent need for more ambitious and effective strategies.

The construction sector is a significant contributor to greenhouse gas emissions in the EU. Greenhouse gas emissions from material extraction, manufacturing of construction products,

as well as construction and renovation of buildings are estimated at 5-12% of total national GHG emissions (EU, 2021b, EEA, 2024b). Implementing better policies aimed at preventing construction and demolition waste could substantially reduce these emissions, especially if prevention measures target the most impactful materials like concrete and steel, and mitigate the environmental impact of the sector. Despite the considerable potential of CDW reduction to lower greenhouse gas emissions and address hazardous substances, only one EU Member State (France) has established a specific target for prevention of this waste stream. This underscores the urgent need for more targeted and effective EU-wide action.

However, setting effective EU targets and related measures for preventing and reusing construction and demolition waste requires careful consideration. These targets must be practical, impactful, and aligned with other policies affecting the building sector. The critical aspects that need to be addressed in this process are outlined below.

Difference between construction waste and demolition waste

Understanding the distinction between construction waste and demolition waste is crucial for effective waste prevention and target setting, as strategies differ for each. Construction waste, generated during building activities, includes excess materials and packaging. It is typically easier to separate construction waste into distinct materials, making recycling and reuse more straightforward. On the other hand, demolition waste arises from tearing down buildings and infrastructure. It consists of diverse materials such as concrete, bricks, and timber, often mixed with hazardous substances. Demolition waste is more challenging to separate, as demolition companies usually do not know exactly what materials are present in the building they are demolishing. As a result, demolition waste prevention focuses on repurposing and renovating structures, while construction waste prevention emphasizes efficient design and material use. Another notable difference is that the economic value per tonne of construction waste is typically higher. Infrastructure projects may also require separate consideration due to their large waste volumes.

Preventing Demolition Waste

The most effective strategy for minimizing demolition waste is to avoid demolition in the first place. Instead, focusing on repurposing and renovation can significantly reduce waste and environmental impact. Cities like Amsterdam and Paris have pioneered approaches to repurpose existing structures rather than demolish them. For instance, Amsterdam's "Circular Building" project (Circl: a completely circular and innovative pavilion - MaterialDistrict) emphasizes the reuse of materials from existing buildings to minimize waste and resource consumption. One example from Paris is "Patrimoine Architectural et Urbain", a policy that promotes the renovation of historic buildings by offering financial incentives, technical assistance, and regulatory flexibility to maintain their historical integrity while integrating modern updates. Additionally, it includes public awareness and education efforts to foster appreciation for architectural heritage.

The Renovation Wave strategy is an EU initiative aimed at accelerating the renovation of buildings to improve energy efficiency, reduce carbon emissions, and enhance living conditions. It supports the prevention of demolition waste by promoting comprehensive, renovations that reuse materials from existing structures, thereby minimizing waste and fostering a circular economy.

Preventing Construction Waste

When it comes to construction waste, the focus shifts to how buildings are designed and the efficiency of material use. Modern architectural practices emphasize designing buildings for minimal demolition waste generation. For instance, modular construction methods allow for precise material usage and easy disassembly, promoting the reuse of building components. The use of prefabricated components reduces on-site waste and allows for better control of material quantities.

Furthermore, incorporating reused building materials into new constructions is a growing trend. Cities like Berlin and Copenhagen are leading the way in this practice. Copenhagen's "Circular Copenhagen" initiative promotes the use of reclaimed materials in new building projects (Building & construction | Circular Copenhagen - cphsolutionslab.dk).

The Danish Klimakrav[12] (Climate Requirements) under the national Building Regulation emphasizes sustainability in construction by integrating life cycle assessments (LCA) into building practices. The Regulation sets limit values for greenhouse gas emissions per m2 of built floor area across a life cycle of 50 years, including the greenhouse gas footprint of the raw materials, of the energy use during the use phase as well as demolition, applicable to new most new buildings. While it primarily aims to improve energy efficiency and reduce greenhouse gas emissions, it does indirectly address the reduction of construction and demolition waste, e.g. by incentivising a longer lifetime of the buildings or choosing reused building elements.

High-quality data and effective assessments are essential for developing meaningful, binding EU targets

A clear and accurate baseline is essential for tracking progress and setting targets that are both ambitious, impactful and achievable. Currently, while data on construction and demolition waste is relatively well-defined and reported to Eurostat under the Waste Statistics Regulation, there are significant challenges for setting such targets. For example, large variations in generation between Member States - both per capita and relative to Gross Value Added (GVA) in the construction sector complicate the establishment of a reliable baseline. These variations are even more pronounced for excavated soils from construction activities. Another challenge is that large infrastructure projects generating large amounts of waste might contribute to such big differences. Moreover, the data is highly aggregated and does not differentiate between infrastructure and construction and demolition of buildings. Additionally, there is no data available on specific materials or the waste composition

Eurostat has developed harmonization guidance and is continuously engaging with Member States to improve data quality, and it can be expected that the CDW data will improve over time. Consequently, further analysis and harmonization of CDW data are necessary before establishing a meaningful baseline for setting targets.

Furthermore, setting a binding target for CDW prevention is currently challenging due to the absence of established national targets and evaluations of existing measures and policies implemented by Member States.

In conclusion, before establishing binding targets, it would be useful to improve data collection on CDW by clearly distinguishing between demolition waste and construction waste. This

[12] Klimakrav (LCA) i bygningsreglement | Social- og Boligstyrelsen (sbst.dk)

would require either a revision of the Waste Statistics Regulation, or a separate reporting requirement on CDW with breakdown by construction/demolition. This refinement will not only deepen the understanding of each waste stream but also enable a more thorough evaluation of current prevention measures and strategies. Moreover, improved data collection will provide valuable insights into baseline conditions and help determine appropriate target levels for prevention of CDW.

It would also be beneficial to investigate the reasons to the significant discrepancies in reported CDW across Member States.

Premature to set binding reuse targets

Regarding binding reuse targets, a major challenge is the absence of a standardized method for measuring reused materials and products. Currently, the quality of baseline data on the reuse of building materials and products is insufficient, with only a single quantitative data point from 2021 of low quality. This makes it challenging to set accurate and meaningful targets. Additionally, it is crucial—but complex—to clearly differentiate between 'reuse' and 'preparing for reuse' to establish clear and enforceable regulations. As such, setting binding reuse targets at this stage would be premature until these foundational issues are addressed.

To improve data quality over time, it is essential to address the lack of standardized methods in the current Implementing Decision (EU) 2021/19, which mandates EU Member States to report on construction materials and products. The first round of reporting revealed a diverse range of methods and approaches among Member States. Supporting Member States in developing consistent data collection methods and creating platforms for sharing best practices and lessons learned will be crucial. If data quality does not improve by the next reporting cycle in 2026, revising the reporting requirements may be necessary, including setting clearer standards for data quality and providing detailed guidance on appropriate methods.

EU level measures to strengthen reuse and prevention as a next step

While setting specific quantitative targets may still be premature, mandatory EU-level measures to promote reuse and waste prevention in the construction sector present a feasible and impactful next step. Building on successful strategies from various Member States, key measures such as mandatory pre-demolition audits, selective demolition practices, Extended Producer Responsibility (EPR) for construction materials, and the required use of Green Public Procurement (GPP) criteria—particularly for infrastructure projects—are promising options. Pre-demolition audits can identify reusable building elements and ensure that hazardous materials are kept separate during demolition. GPP can stimulate demand for reused building materials and encourage decisions that favour renovation over demolition, as well as the selection of materials with fewer hazardous substances. This approach prevents hazardous waste from being generated during construction and later demolition. While EPR has traditionally focused on waste management, recent developments are broadening its role to support prevention goals. For example, eco-modulation of fees can incentivize the choice of more sustainable materials, while EPR fees can fund reuse initiatives, aligning EPR with circular economy objectives.

Some of these measures are already in place at the national level and could serve as models for EU-wide adoption. For instance, the EU's GPP criteria for road design, maintenance, and office building construction and management are already available for voluntary use.

The JRC's report *"Policy Measures Fostering Reuse and High-Quality Recycling of Construction and Demolition Waste (CDW)"*[13] provides valuable recommendations for addressing the challenges and opportunities related to CDW management, including additional measures to increase reuse that could be implemented at the EU level.

[13] To be published later this year

5 Municipal waste including bulky waste

What is it and why is it important to prevent?

Municipal waste accounts for approximately for approximately 10% of the total waste generated in the EU (Eurostat, 2024d).

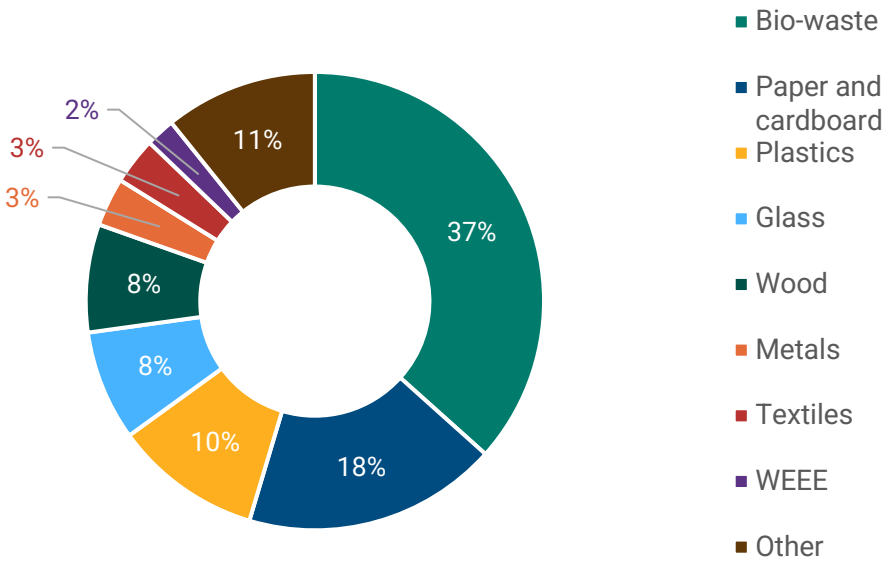
Municipal waste is defined in the WFD as:

(a) mixed waste and separately collected waste from households, including paper and cardboard, glass, metals, plastics, biowaste, wood, textiles, packaging, waste electrical and electronic equipment, waste batteries and accumulators, and bulky waste, including mattresses and furniture;

(b) mixed waste and separately collected waste from other sources, where such waste is similar in nature and composition to waste from households.

Bio-waste (food and garden waste) is on average the largest fraction of municipal waste, followed by paper and cardboard and plastic waste (Figure 7). Bulky waste, furniture and mattresses might be included in several categories, including wood, textiles, or other waste. It can be assumed that a considerable share of paper and cardboard, glass and plastics is packaging, but actual data on the share of packaging in municipal waste is not available, because the reported breakdown data is focused on material, and no further breakdown on the sources of the materials is required. Data on packaging waste, on the other hand, is reported as the sum of packaging from households and commercial/industry activities, and the reported data does not give any breakdown on the sources of the packaging.

Figure 7 Municipal waste composition, EU average



Note: calculated based on Member State level data, varying reference years ranging from 2018 to 2020 by Member State.

Source: EEA, using waste composition data collected for the preparation of the early warning assessments published in 2023 (EEA, 2023a).

Municipal waste is chosen as a prioritized waste stream in this study due to its high visibility among citizens, its complex composition and its significant role in many EU member states' waste prevention programs. Frequently in the public eye, it is a key target for raising awareness and driving behavioural change. The Scoping study to assess the feasibility of further EU measures on waste prevention highlights municipal solid waste as a priority for further EU waste prevention measures, indicating significant potential for impact.

5.1 Policy context

Currently, the EU does not have a specific target for preventing municipal waste. The Circular economy action plan 2020 and the Zero Pollution action plan state the ambition to halve non-recyclable municipal waste. According to an EEA analysis (EEA, 2022), simply increasing recycling rates will not be enough to meet this goal. If municipal waste generation continues to rise, at least 72% of the waste would need to be recycled to achieve this halving ambition by 2030. This represents a significantly higher recycling rate than what is currently being achieved and exceeds the targets of 60% and 65% recycling set for 2030 and 2035, respectively.

Additionally, the slow progress of many Member States towards the targets for recycling and preparing for reuse of MSW, as highlighted in the EEA's early warning assessments (EEA, 2023b), suggests that the halving ambition will be out of reach without a stronger focus on waste prevention. Alternatively, this ambition could be met by reducing municipal waste generation by around one-third, or through a combination of increased recycling and waste reduction strategies (EEA, 2022).

5.2 Development of waste amounts

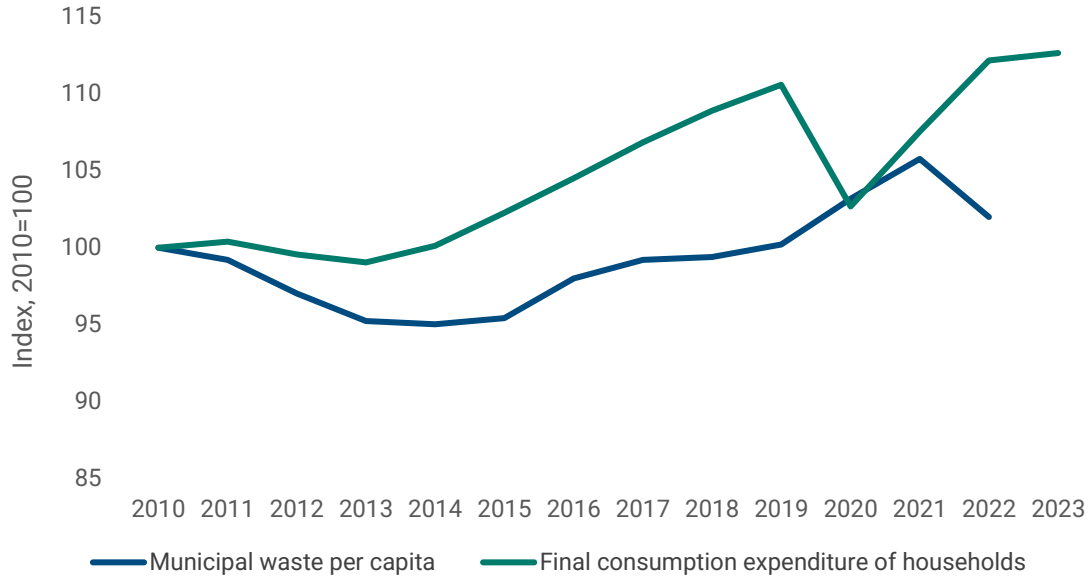
In 2022, per capita municipal waste generation in the EU was 513 kg, up slightly from 503 kg in 2010 (Eurostat, 2024e). Although there has been an increase, the overall trend has remained relatively stable, with municipal waste growing at a slower pace than household consumption expenditure.

Recent trends may be influenced by changes in how Member States report municipal waste under the revised definition in the Waste Framework Directive. For instance, Belgium began including municipal waste from sources beyond households in 2020, leading to a sharp increase from 416 kg per capita in 2019 to 729 kg per capita in 2020, causing a noticeable break in the time series (EEA, forthcoming).

Additionally, the data from 2020 and 2021 may reflect the impact of the COVID-19 pandemic on waste generation.

There are still significant differences in municipal waste generation across Member States, ranging from 303 kg per capita in Romania to 803 kg per capita in Austria—a difference of 2.7 times (Figure 14). These disparities are likely driven by variations in household consumption expenditure, which can differ by as much as a factor of 5.3 between Member States (Eurostat, 2024f). However, another reason is that member states to different degrees include waste similar to household waste from other sources (such as services and administrations) in the reported municipal waste (Municipal waste statistics - Statistics Explained (europa.eu).

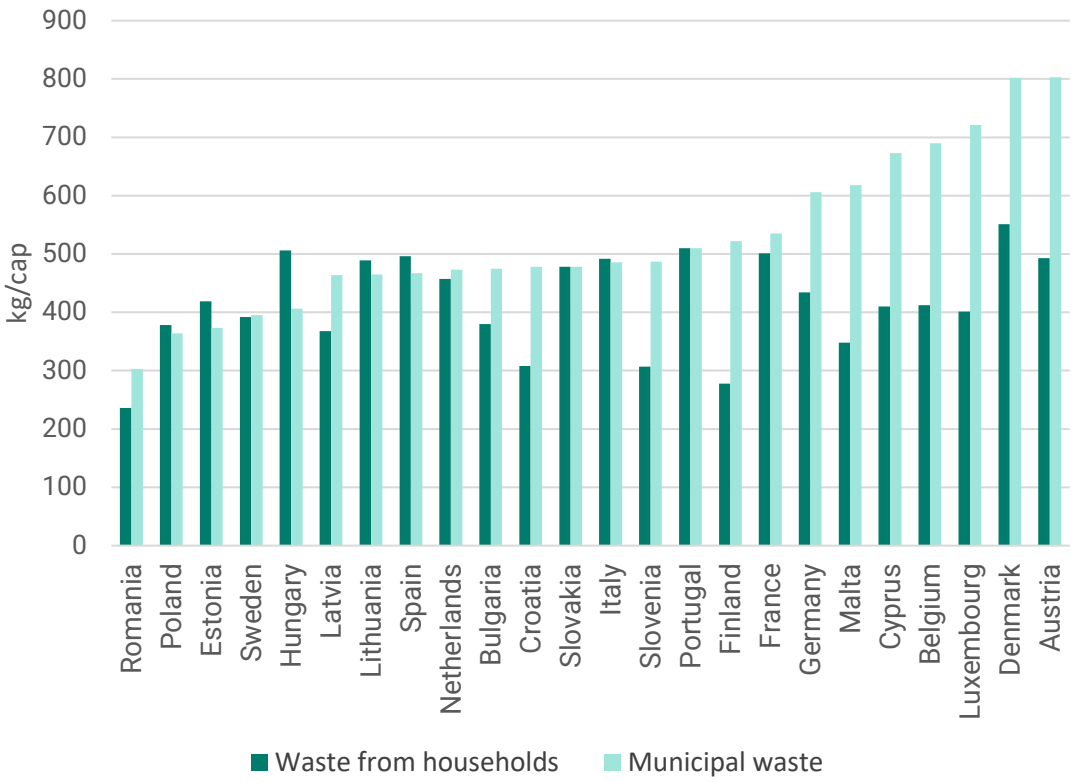
Figure 8 Trend in generation of municipal waste per capita vs household consumption expenditure, EU-27



Source: EEA based on Eurostat, Municipal waste by waste management operations (env_wasmun) and Eurostat, GDP and main components (nama_10_gdp).

The issue of the degree of inclusion of waste similar to household waste from other sources can be illustrated by comparing the waste reported as generated by households under the Waste Statistics regulation with the amounts of generated municipal waste (Figure 9). It shows that in all Member States with per capita amounts of municipal waste above 600 kg/cap, the amount of household waste is below 550 kg/cap, corresponding to less than 75%. Several Member States seem to mainly include household waste in the reported municipal waste data, and Italy, Portugal and Slovakia event report the same generated amounts in both datasets.

Figure 9 Generation of municipal waste and of waste generated by households, by country, 2022



Note: Household waste is calculated as total waste generated by households, excluding discarded vehicles.

Source: EEA based on Eurostat dataset 'Municipal waste by waste management operations (env_wasmun)' and Eurostat dataset 'Generation of waste, by waste category, hazardousness and NACE Rev. 2 activity (env-wasgen)' for waste generated by households.

5.3 Overview of waste prevention targets and measures for MSW in the EU 27 Member States

Measures to promote reuse and waste prevention:

In the EU-27 Member States, various measures have been implemented to increase the reuse of MSW. France has established comprehensive waste prevention programs that include public awareness campaigns. They have also introduced Extended Producer Responsibility (EPR) schemes for textiles and furniture. The EPR system for furniture in France focuses on waste prevention and reuse. Managed by the organization Ecomaison, it supports the reuse of old furniture by promoting second-hand markets and refurbishing items to extend their life before they are eventually recycled. The scheme also includes measures to encourage producers to design furniture that is more easily repairable and recyclable.

Moreover, Sweden and Austria have initiated repair and reuse initiatives, supporting local repair shops and community workshops while encouraging educational programs on the benefits of repairing items rather than discarding them.

In Denmark, efforts to enhance community engagement aim to increase public awareness about waste prevention through initiatives like swap events and repair cafes.

Italy has implemented legislation that promotes the reuse of products, including provisions for the collection and redistribution of items such as textiles and electronics.

Many countries have also supported second-hand markets, promoting the sale and trade of pre-owned goods. Collaborations with nonprofit organizations have proven effective in collecting and redistributing reusable items, for example in Belgium.

Several EU Member States have introduced tax breaks or incentives to promote product repair. In Sweden, the VAT on repair services for items like bicycles and clothing was reduced from 25% to 12% in 2016 and further cut to 6% in 2022, though this rate has reverted to 12% as of April 2023. Additionally, Sweden offers a tax deduction system that allows individuals to deduct 50% of labour costs for household appliance repairs, with specific limits on the total amount deductible.

In the German state of Thuringia, consumers can use a repair bonus to reimburse a maximum of 100 euro for the repair of a product. The program was launched in June 2021 and already had 7000 residents applying for the bonus. Most of the appliances were repaired in specialized retailers, electronics stores or through the costumer services of the manufacturers. The success in Thuringia inspired the state of Bavaria to unroll a similar program. Inhabitants of Bavaria are offered a bonus of 200 euro a year for repair[14].

The Austrian government started a nationwide bonus program for repair in 2022. Austrians can register for a voucher online and use it for the repair cost of almost all electrical and electronic devices. The vouchers cover half of the total repair cost, up to an amount of 200 euro. Companies that want to participate, need to register online. The government has provided 60 million euro to fund the repair campaign until the end of 2023[15].

France has introduced a repair fund to encourage the repair of out-of-warranty electrical and electronic devices by offering discounts on repair costs. This initiative, which started in 2022, is part of France's broader anti-waste and circular economy law, funded through Extended Producer Responsibility (EPR) fees collected from manufacturers. Consumers can receive a discount, typically around 20% off the repair bill, when using a repairer accredited with the QualiRépar label.

Targets for prevention of MSW and reuse

Ten countries; France, Belgium (Flanders and Brussels regions), Bulgaria, Estonia, Germany, Italy, Latvia, Lithuania, Slovakia and Romania have set targets to reduce municipal or household waste in their national waste prevention programs or other policy strategies. Luxembourg has set a target for reducing bulky waste in the municipal solid waste stream. Eight of the targets are absolute targets, including Germany[16], which recently shifted from a GDP-relative target to an absolute one. Two countries, Estonia and Italy, have chosen GDP-relative targets (Table 1).

[14] Provide financial incentives for citizens to choose repair | Sharepair

[15] Provide financial incentives for citizens to choose repair | Sharepair

[16] Target proposed in the draft Circular economy strategy (Entwurf einer Nationalen Kreislaufwirtschaftsstrategie (NKWS) (bmuv.de)), still to be confirmed

Targets are defined in different ways (Table 1):

- Related to household waste only, or to municipal waste,
- Per capita or in absolute value,
- Quantified or directional only,
- Absolute or related to economic development,
- Related to all household/municipal waste generated, or to residual municipal waste (combined prevention/management target).

The largest number of targets relates to household and/or similar waste, followed by targets on food waste and packaging (Figure 10 and Table 2). Belgium has the highest number of targets, although some of them only apply in some of the Belgian regions (Figure 11).

Table 1 Targets in MS's national plans and strategies addressing total MSW

Country	Target
Belgium - Brussels	Reduce household waste per capita: 5% by 2023; 20% by 2030.
Belgium – Flanders	Household and similar industrial waste plan 2016-2022: The targets were absolute stabilization of household waste and a relative decrease of household waste compared to consumption. These targets were met. Household and similar waste from companies (collected together with household waste by public operators) has decreased from 522kg/inh in 2013 to 416kg/inh in 2022, thus reaching the plan target of 502 kg/inh in 2022. A reduction target for residual household waste is set at 100 kilograms per inhabitant per year by 2030. This target aims to significantly reduce the amount of residual waste generated per person and is part of Flanders' broader waste management and circular economy strategy. The target is designed to encourage waste reduction and promote more effective recycling and waste prevention measures.
Bulgaria	Decrease in generation of household waste per capita by municipalities by 2028 in comparison to 2020. This target is not quantified.
Estonia	Relative growth of MSW generation compared to relative increase in GDP remains less than 50 %.
France	Reducing the quantities of household and similar waste produced per inhabitant by 15% by 2030 compared to 2010.
Germany	In June 2024, the Ministry of Environment published the new draft circular economy strategy, which includes a target to reduce the generation of municipal waste per inhabitant by 10 % and 20 % by 2030 and 2045, respectively.
Italy	5 % reduction in the ratio of generated municipal solid waste (MSW) to gross domestic product unit (GDP).
Latvia	Amount of waste generated in households to diminish to < 650 000 t/year and <400 kg/capita/year compared to 869 285 t/year and 459 kg/capita/year in 2021.

Lithuania	Municipal waste per capita: below the average of the European Union in both 2025 and 2027.
Slovakia	By 2025, reduce the amount of mixed municipal waste by 50% compared to 2016.
Romania	By 2025, reduce household waste per capita by 10 % compared with 2017 (i.e. reduce municipal waste from the 228 kg/capita recorded in 2017 to 204 kg/capita in 2025)

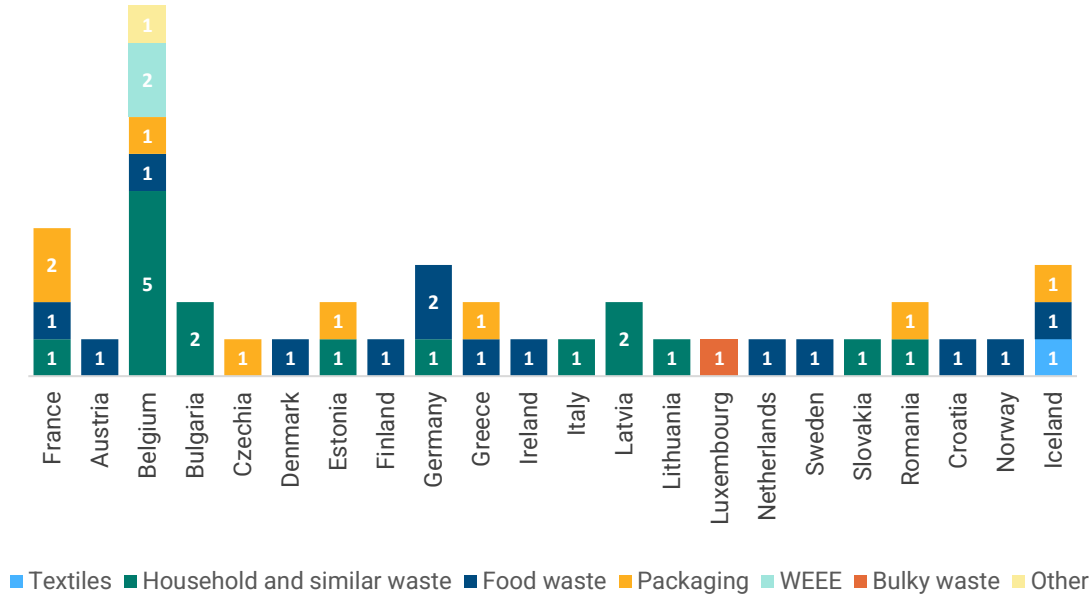
Table 2 Targets addressing specific waste streams within MSW

Food waste	23 out of 27 countries have implemented national targets to reduce food waste. This significant adoption is likely influenced by Sustainable Development Goal 12.3, which was adopted in 2015 and aims at halving per capita global food waste at the retailer and consumer levels and reduce food losses along production and supply chains, including post-harvest losses by 2030 compared to 2015. The alignment with SDG 12.3 underscores the EU's and MS's responsiveness to international commitments in shaping national policies.
Packaging and Packaging Waste	Six countries have set targets to reduce packaging and packaging waste: France, Belgium, Czechia, Greece, Romania, and Estonia.
Waste Electrical and Electronic Equipment (WEEE)	Only one region, Wallonia in Belgium, has established targets for reduction of WEEE.
Textiles	The Extended Producer Responsibility (EPR) for Textiles Decree in the Netherlands, which took effect on July 1, 2023, mandates that producers and importers of clothing and household textiles manage the waste phase of their products. The government has set targets for recycling and reuse, requiring that 50% of textiles released on the Dutch market be recycled or reused by 2025, with an increase to 75% by 2030; currently, about 35% is being reused and recycled. Iceland has established a goal to limit the amount of textiles and footwear waste to no more than 10 kg per inhabitant per year by 2027.
Bulky waste	Luxembourg has a target to reduce bulky waste by 20% by 2025 compared to 2018.

Figure 10 Number of quantified waste prevention targets per waste category

Source: EEA waste prevention country fact sheets

Figure 11 Number of quantified waste prevention targets by country



Source: EEA waste prevention country fact sheets

Reuse targets

Few EU member states have established specific targets for reuse of municipal solid waste, and among those that have, the type of targets vary (Table 3).

Table 3 Targets on reuse in Member States

Country	Target

Belgium - Brussels	In Belgium's Brussels region, the target is to achieve a reuse rate of 5 kilograms of municipal solid waste per inhabitant per year by 2030.
Belgium – Flanders	In the Flanders region of Belgium, the target for 2022 was to achieve 7 kilograms of municipal waste reused per inhabitant. Additionally, reuse centers were expected to reach a reuse rate—defined as the ratio of sold to collected waste—of at least 50%. While these targets were not fully met, they were closely approached. In 2022, the actual reuse amounted to 6 kilograms per inhabitant, with a reuse rate of 47%. Under the new plan, the target has been increased to 8 kilograms per inhabitant by 2030, while maintaining the goal of a 50% reuse rate.
France	France has set targets for the reuse of packaging materials. The goal is to increase the proportion of reused packaging relative to single-use packaging, aiming for 5% of reused packaging by 2023 and 10% by 2027. This is measured in terms of sales units or their equivalent.
Ireland	In Ireland, the National Waste Management Plan for a Circular Economy has established a reuse target of 20 kg of reusable material per capita per annum. This target is part of a broader strategy to enhance waste prevention, encourage recycling, and promote the circular economy. The plan aims to minimize waste generation and improve resource efficiency across various sectors, with a focus on encouraging the reuse of products and materials. The government plans to implement measures to support this target, including public awareness campaigns, incentives for businesses, and improvements in infrastructure for the collection and processing of reusable materials.
Sweden	Sweden has a reuse target for packages that says that the proportion of packaging placed on the Swedish market for the first time that is reusable must increase by at least 20 percent from 2022 to 2026 and by at least 30 percent from 2022 to 2030'.

Source: EEA waste prevention country fact sheets

Currently, no consolidated overview exists regarding the implementation mechanisms for the waste prevention and reuse targets. Specifically, details about the responsibilities for meeting these targets, enforcement mechanisms, and the consequences for non-compliance are not available systematically. This information is crucial as it would provide insights into the robustness and effectiveness of the targets.

5.4 Reflections on the feasibility of new prevention and reuse targets

Prevention target(s)

Setting mandatory quantitative targets for municipal solid waste (MSW) prevention is a politically viable approach, as evidenced by the strong public support for circular economy practices. According to the Special Eurobarometer 550[17], that measures attitudes of Europeans towards the environment, 'the promotion of the circular economy through reducing waste and reusing or recycling products is considered as the most effective way of tackling environmental

[17] Attitudes of Europeans towards the environment

problems'. Aligning such targets with the EU's Circular Economy Action Plan would further reinforce their legitimacy and coherence with the EU's resource efficiency and waste reduction objectives. Moreover, several Member States have already implemented prevention targets for MSW or household waste, offering valuable lessons and practical insights that can guide the development of a mandatory EU target.

Implementing such targets at the EU level would allow MS the flexibility to prioritize specific waste streams within MSW for targeted prevention efforts tailoring strategies to their unique context. Such targets could also both reinforce and complement already existing or proposed EU targets on the prevention of food waste and packaging waste, and reduction measures related to single-use plastics, as they would be able to address municipal waste components currently not targeted, such as garden waste, bulky waste (including furniture), WEEE, textiles, and all types of waste generated by consumer goods. One of the options for MS to reduce such waste (except of garden waste) would be fostering reuse, thereby creating an additional push for the reuse measures reported under Art. 9(4) WFD to deliver effective reuse. The future development of eco-design requirements under the ESPR for products that end up in municipal solid waste, e.g. textiles and electric and electronic equipment, will also support MS to meet such targets, and could motivate MS to engage in the eco-design requirements setting procedures.

Municipal waste data is rather well-established and robust, especially after the new definition of MSW in the 2018 WFD will have been fully implemented in MSW statistics reported to Eurostat. However, not all MS have fully adapted yet to the new definition of MSW, and municipal waste generation levels seem especially to be influenced by the degree of inclusion of waste similar to household waste from other sources such as commerce, trade and administration, as stated by Eurostat (Eurostat, 2024d)Any choice of a base year should therefore take full implementation of the new definition into account, and a base year closer to 2025 might therefore be appropriate as it can be expected that MS will adapt to the new definition of MSW within the next 2-3 years.

Alternatively, it could be considered to base a target on waste from households (as reported under the Waste Statistics Regulation) instead of municipal waste (as reported under the Waste Framework Directive), given that this data is likely to be more comparable between Member States, as also indicated in Figure 9.

Most of the identified MSW prevention targets applied by MS are based on the amount of waste generated per person, which seems to be the best approach for setting a target at the EU level. Some targets are also related to GDP, which can be useful for understanding how waste generation is linked to economic activity. The EEA's waste prevention monitoring framework identified municipal waste per capita as the most appropriate indicator for prevention of municipal waste (EEA, 2023c).

Implementing a monitoring framework and providing support for sharing of best practices will be crucial for achieving such targets.

Target combining prevention and recycling

An alternative to setting a target on the prevention of MSW could be a target on reducing the amount of residual (non-recycled) municipal waste which would be a combined prevention and recycling target. Such a (non-binding) target already exists at EU level in the ambition of the Circular economy action plan to 'halve the amount of residual municipal waste by 2030'.

This ambition is related to the absolute amount of waste generated. As indicated in Section 5.1, EEA analysis has shown that on EU level, this 'halving' ambition cannot be met through the established preparing for reuse and recycling targets for municipal waste (EEA, 2022).

Therefore, a target on residual (non-recycled) municipal waste would give even more flexibility to MS. If such a target is designed as meeting an absolute amount of non-recycled MSW (instead of a percentage reduction), MS with already high recycling rates but high MSW generation would have to do more than MS with high recycling rates and low generated amounts. MS with low MSW amounts and low recycling rates could focus on increasing recycling for meeting such a target.

The generation of total MSW per capita ranges from 303 to 803 kg/cap (a factor of 2.7) (Figure 14) and the generation of non-recycled municipal waste ranges from 182 to 573 kg/cap (a factor of 3.1) (calculated based on Eurostat, 2024e). If the two outliers (Cyprus and Malta) are taken out, this factor decreases to 2.4 for non-recycled MSW. For MS with rather low levels of MSW generation due to a weaker economy, a combined, absolute target might make more sense than a pure waste prevention target which could be perceived as limiting economic development.

Premature to set binding reuse targets for MSW

Municipal waste consists of various waste streams, including waste from textiles, electrical and electronic equipment (EEE), and furniture. Data on the reuse of these product groups has been collected only since the reference year 2021, and the data is far from robust. Member States have had the flexibility to choose their own reporting methods, resulting in a diverse range of approaches. For instance, some Member States utilize surveys and questionnaires distributed to households to assess textile reuse habits, while others may track data through charity shops and thrift stores that report on second-hand sales. Additionally, furniture reuse data may be gathered through municipal bulky waste collection statistics and reports from social enterprises that facilitate the refurbishment and resale of used furniture.

Consequently, the dataset reflects varied methodologies, which hampers reliable inter-country comparisons and highlight the challenges in achieving a standardized understanding of reuse across the EU. Discrepancies may also be present in the reuse data due to varied interpretations of the waste categories. For instance, in many countries, used products collected for reuse are not classified as waste but as products. For textiles, most countries do not consider items donated to organizations, stores, or second-hand shops as waste. However, some Member States classify bagged textiles as waste, as the contents are unknown to collectors until they are opened and sorted. Following assessment, textiles deemed suitable may then be designated for reuse. In contrast, countries like Denmark, Czechia, Slovenia, and Sweden consider the intent indicated by the collector or bin labelling—such as instructions for reuse—to determine whether deposited textiles are intended as waste. When collection bins are used without interaction, the collector's messaging on the bin itself is essential to clarify the disposal purpose, specifying items accepted and their intended use. (EEA, 2024)

These inconsistencies make it difficult to set a meaningful target or establish a reliable baseline. With only one fragmented quantitative data point available (2021), there is not enough evidence to accurately assess the current state of reuse or predict future trends. As a result, setting a binding EU target for the reuse of municipal waste at this stage would be premature and could lead to ineffective policies. Developing and harmonizing data collection methods is essential before moving forward with any such target.

The European Environment Agency will launch a project in 2025 aimed at evaluating reuse policies across EU Member States reported in 2023 to identify effective practices, innovative measures, and leading countries in reuse initiatives. The project seeks also to improve data quality on reuse and extract actionable measures that Member States can adopt. Additionally, the project will clarify reuse terminology, develop an analytical framework based on the Waste Framework Directive, and examine how reuse reporting interacts with other EU requirements to harmonize efforts and avoid double counting across areas such as municipal and electronic waste.

The way forward - harmonised measures at the EU level that support eco-design and mandatory reuse reporting

Until more robust data becomes available and before quantitative targets for reuse can be set, it will be essential to develop and implement harmonised EU measures that support reuse through eco-design of products and mandatory reporting of reuse data. The timely and effective implementation of the Ecodesign for Sustainable Products Regulation (ESPR) stands out as a critical initiative in this regard, as it establishes new design requirements that promote durability and reparability. Similarly, the revision of the Construction Products Regulation, once adopted, could be a milestone for enabling the reuse of construction products if implemented swiftly.

Furthermore, the European Sustainable Products Regulation (ESPR) introduces Digital Product Passports (DPPs) to provide detailed information on the sustainability aspects of products, including their composition, repairability, and origin. These passports are intended to support consumers and businesses by making it easier to access data that facilitates reuse and repair. However, the implementation of DPPs will be a gradual process, as the European Commission has adopted a phased approach. Initial efforts will focus on high-impact product categories like electronics and batteries, but full integration across the market will take considerable time.

There is also an opportunity to strengthen reuse when revising other existing EU legislation. The revised End-of-Life Vehicles (ELV) Directive exemplifies EU legislation that promotes reuse and serves as a reference point for revising other directives, such as the Waste Electrical and Electronic Equipment (WEEE) Directive and when developing Extended Producer Responsibility (EPR) for textiles. Notably, the ELV Directive mandates manufacturers to report on reuse data, including the quantities and types of spare parts reused. It also ensures that spare parts are available for at least ten years post-production, which further supports reuse and repair initiatives. This comprehensive approach provides a valuable model for other product categories. The proposed Packaging and Packaging Waste Regulation (EC, 2022) includes specific reuse and refill targets for the packaging of selected products, to be met by manufacturers and/or distributors making available on the market and requires reporting of reuse data corresponding to these targets.

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Annex 1 – Waste streams included in this study

This chapter explains why certain waste streams are prioritized for this study, focusing on their significant impact and potential for improvement. The selection was informed by the report "Scoping study to assess the feasibility of further EU measures on waste prevention". It also details why other waste streams were excluded due to existing regulations, parallel ongoing initiatives, or specific challenges.

Included waste streams

Construction and Demolition Waste (CDW)

Construction and demolition waste (CDW) was selected as a focus due to its significant contribution to total waste in the EU, accounting for approximately 40%[18]. This waste stream often contains hazardous materials, such as PCB and asbestos, posing serious risks to the environment and human health if not separated and treated properly. In addition to being identified as a priority in the 2022 scoping study[19], CDW is also recognized as a key product value chain within the Circular Economy Action Programme (CEAP).

Municipal Solid Waste

Municipal solid waste is crucial to focus on due to its high visibility among citizens and its significant role in many EU member states' waste prevention programs. Frequently in the public eye, it is a key target for raising awareness and driving behavioural change. The scoping[20] study highlights municipal solid waste as a top candidate for further EU waste prevention measures, indicating significant potential for impact.

Excluded Waste Streams:

Waste Electrical and Electronic Equipment (WEEE)

WEEE is excluded because, despite being identified as a priority for EU measures due to its rapid growth and associated risks, it will be addressed through the planned revision of the WEEE Directive. Part of this waste stream is included in the municipal solid waste.

Tyre Waste

Tyre waste is excluded from the study due to insufficient data. Additionally, the Joint Research Center (JRC) is currently developing design requirements for tyres as basis for developing ecodesign requirements under the Ecodesign for Sustainable Products Regulation (ESPR).

End-of-Life Vehicles (ELVs)

[18] JRC Publications Repository - Techno-economic and environmental assessment of construction and demolition waste management in the European Union (europa.eu)

[19] "Scoping study to assess the feasibility of further EU measures on waste prevention".

ELVs are excluded because they are already addressed through ongoing regulatory efforts, including a proposed new End-of-Life Vehicles Regulation, which includes circular design requirements aimed at increasing reuse.

Batteries

Batteries are excluded due to the adoption of the new Batteries Regulation on July 12, 2023, which establishes comprehensive measures for managing battery waste, including collection, recycling, and handling hazardous substances. Small portable batteries are included in the municipal solid waste.

Packaging Waste

Packaging waste is excluded because new EU-wide rules, including prevention targets and measures, are currently under negotiation. The forthcoming Packaging and Packaging Waste Regulation is set to address this waste stream comprehensively. Part of this waste stream is included in the municipal solid waste.

Industrial Waste from production processes and mining activities

Industrial waste from production and mining processes is excluded due to existing regulations and initiatives, including the Industrial and Livestock Rearing Emissions Directive (IED 2.0) and the Waste Framework Directive's Article 11(6) review clause, which already mandate waste reduction provisions. According to the IED 2.0, permits for industrial installations must contain binding quantitative resource efficiency requirements for materials, water and energy, as appropriate, to better address water scarcity challenges and waste generation.

Agricultural Waste – Waste from Agriculture, Fishing, and Forestry Sectors

Agricultural waste is excluded due to the lack of harmonization in waste statistics across EU Member States and existing regulations, such as the Industrial Emissions Directive, which already address parts of this waste stream.

Hazardous Waste

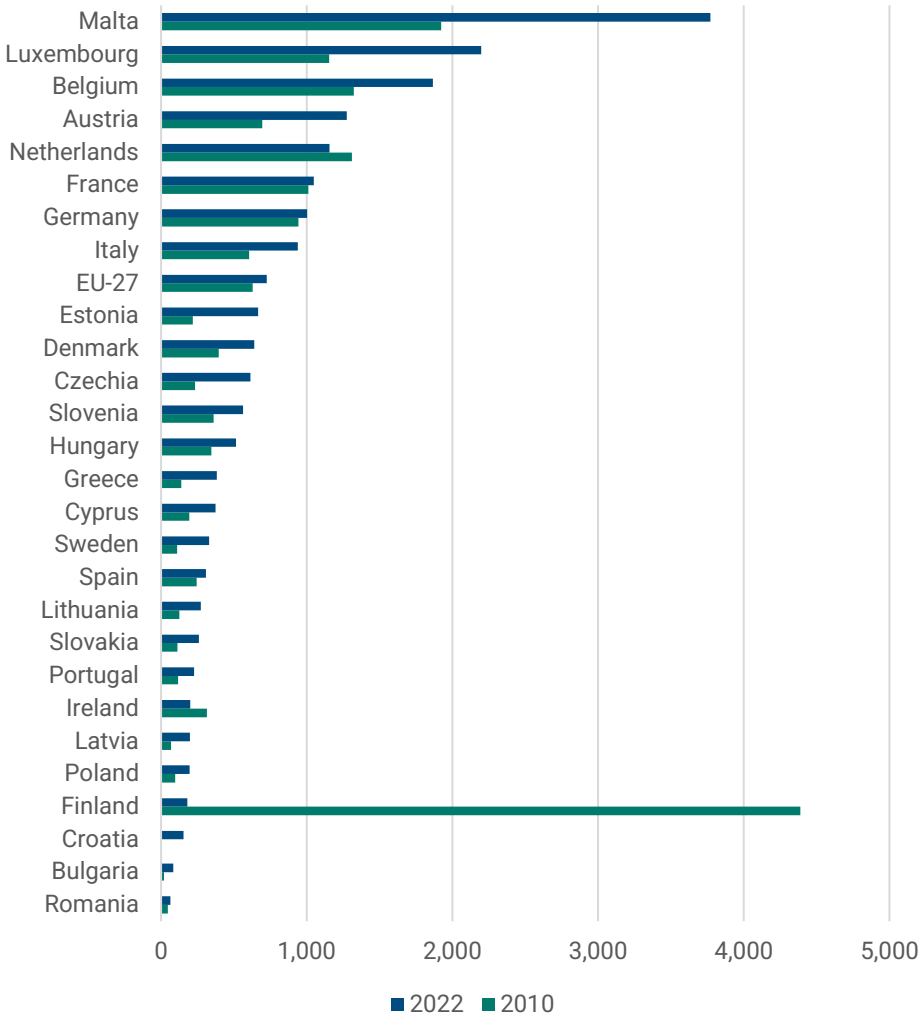
Hazardous waste is excluded due to ongoing regulations specifically targeting this stream, including the Industrial and Livestock Rearing Emissions Directive for hazardous waste from industry, and various product related directives and regulations (Battery Regulation, RoHS Directive, WEEE Directive, ESPR, REACH). In addition, Art. 20(1) WFD requires Member States to collect hazardous waste from households separately by 01/01/2025, for reducing the hazardousness of household waste (qualitative prevention) (Art. 20(1)).

Waste from Single-Use products

Waste from single-use products is excluded because many single-use plastic items are already addressed under the Single-Use Plastics (SUP) Directive and the proposed Packaging and Packaging Waste Regulation (PPWR). Additionally, the lack of comprehensive information on items outside municipal solid waste further justifies not covering this category separately. Many single-use products are part of municipal waste.

Annex 2 Country breakdown data

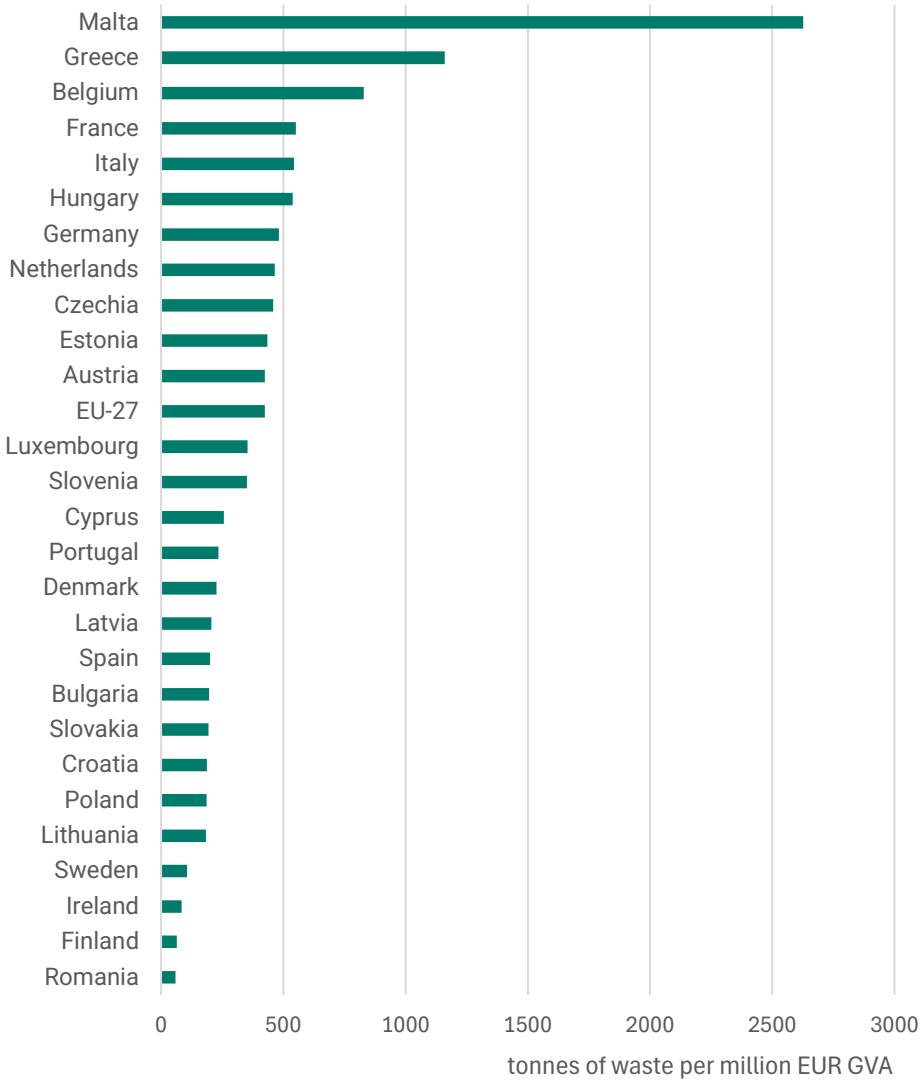
Figure 12 Mineral waste from construction and demolition by Member State, per capita, in 2010 and 2022



Note: Break in time series indicated between 2010 and 2021 for CZ and PT.

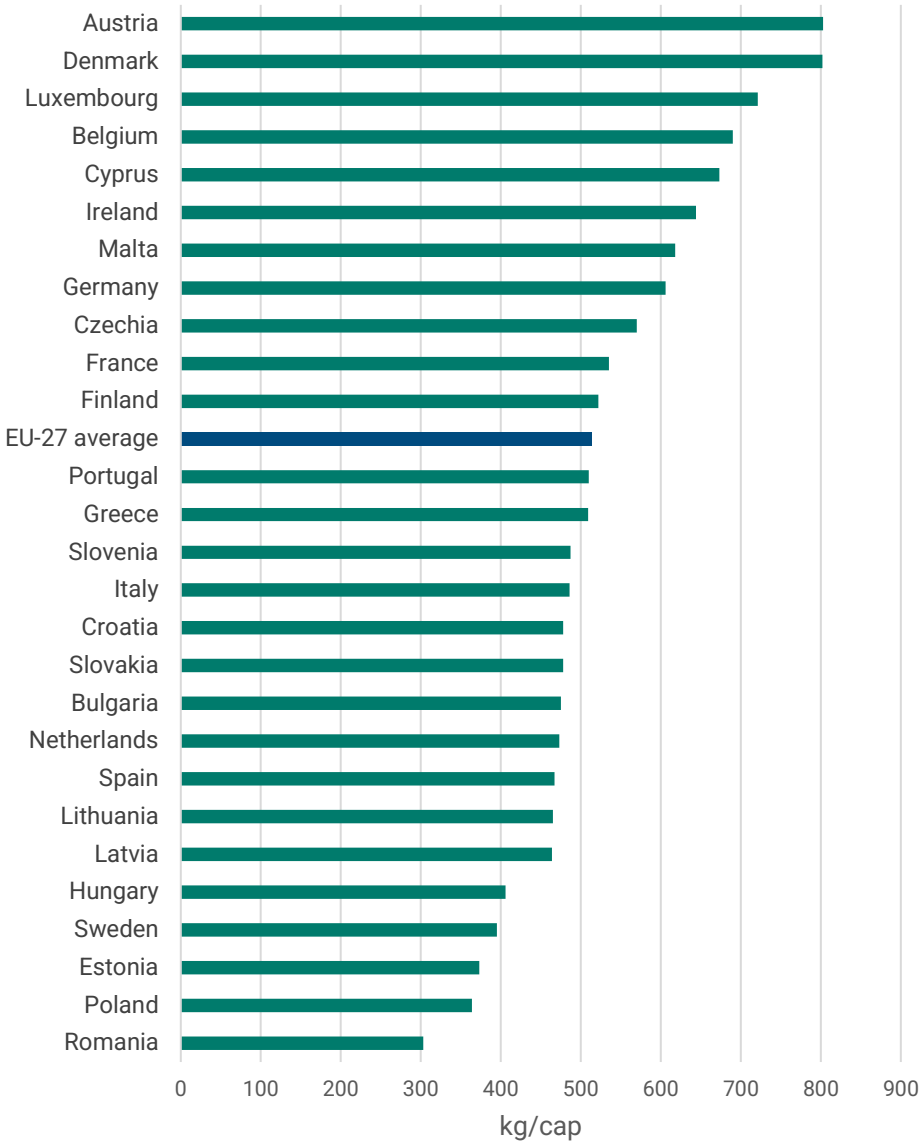
Source: Eurostat, Generation of waste by waste category, hazardousness and NACE Rev. 2 activity (env-wasgen)

Figure 13 Mineral waste from construction and demolition by Member State, per million EUR GVA generated in the construction sector, 2022



Sources: 1) Eurostat, Generation of waste by waste category, hazardousness and NACE Rev. 2 activity (env-wasgen), 2) Eurostat, Gross value added and income by A*10 industry breakdowns [nama_10_a10]

Figure 14 Municipal waste per capita by MEMBER STATES, 2022



Note: for Ireland, 2020 data substituted for 2022. For Czechia and Greece, 2021 data substituted for 2022. Break in time series indicated between 2015 and 2021 for BE, CZ, IE, LU, AT, SE.

Source: Eurostat env_wasmun