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" In 2021, the EU generated an estimated 188.7 kg of packaging waste per inhabitant (varying from 73.8 kg per inhabitant in Croatia to 246.1 kg per inhabitant in Ireland). "

" From 2010 to 2021, 'paper and cardboard' was the main packaging waste material in the EU (34.0 million tonnes in 2021), followed by plastic (16.1 million tonnes) and glass packaging waste (15.6 million tonnes). "

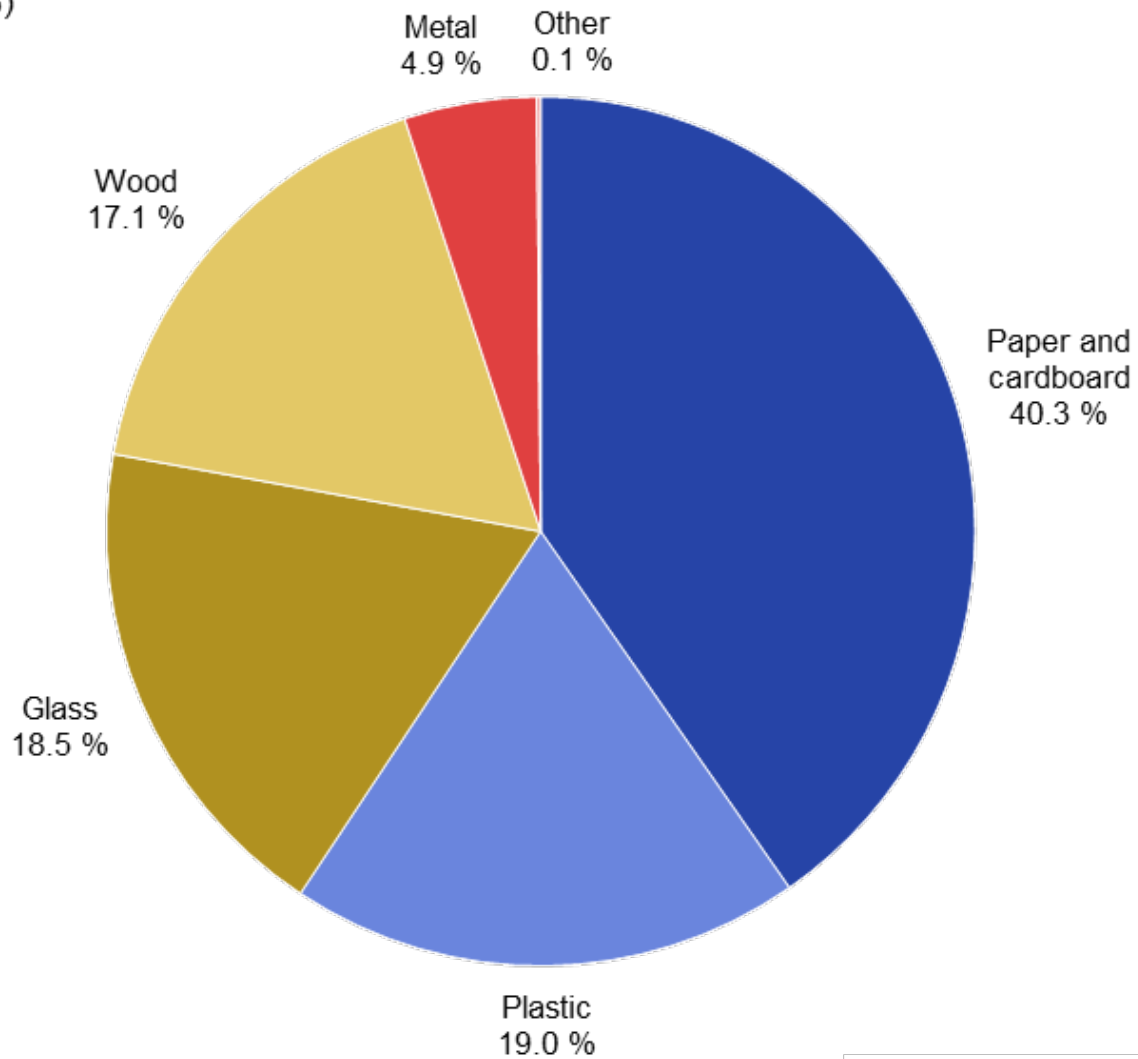
This article shows recent statistics on packaging waste in the 27 [European Union \(EU\) Member States](#) and some non-EU member countries. In particular, it summarises the developments during the period 2010–2021, for which official reporting on packaging waste for all EU Member States is available. The data is only partly comparable, due to a change in calculation methods for reference year 2020 onwards. The change mainly affects the calculation of recycled amounts of packaging waste. Information and data are based on the [Directive 94/62/EC \(consolidated text\)](#), which lays down the recycling and recovery targets. The Directive aims at providing a high level of environmental protection and harmonising national measures concerning the management of packaging and packaging waste.

Waste generation by packaging material

In 2021, the [EU](#) generated an estimated 188.7 kg of packaging waste per inhabitant. This quantity varied between 73.8 kg per inhabitant in Croatia and 246.1 kg per inhabitant in Ireland. Figure 1 shows that in 2021 paper and cardboard (40.3 %), plastic (19.0 %), glass (18.5 %), wood (17.1 %) and metal (4.9 %) are the most common materials of packaging waste in the EU. Other materials represented only 0.1 % of the total volume of packaging waste generated in 2021.

Packaging waste generated, by packaging material, EU, 2021

(%)



Note: Eurostat estimates.

Source: Eurostat (online data code: env_waspac)

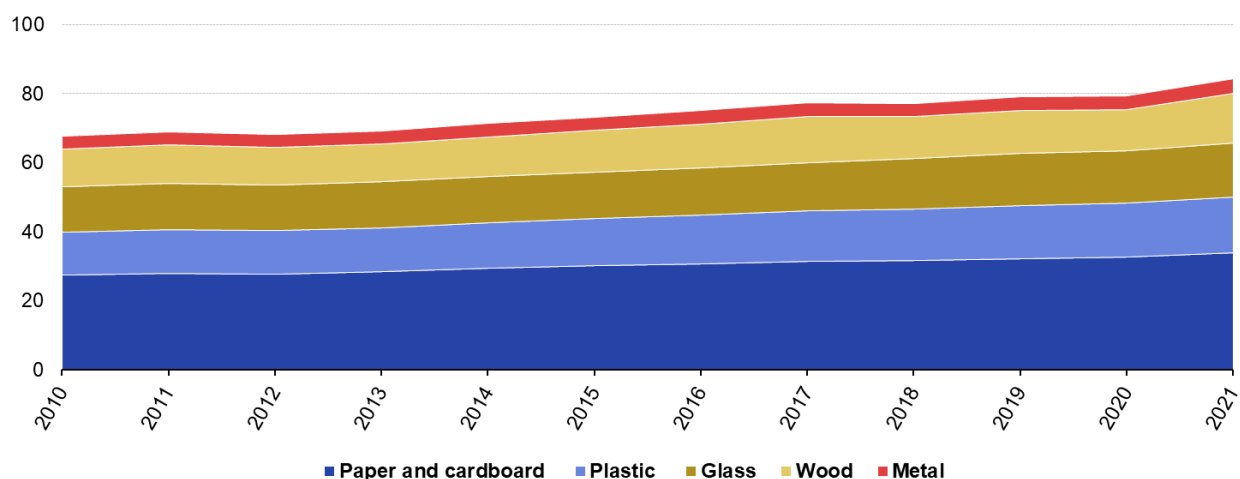
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Time series of packaging waste

Figure 2 shows the development of packaging waste generated in the EU from 2010 to 2021. The total quantity of generated packaging materials rose by 16.4 million tonnes from 2010 to 2021 (+24.2 %).

Packaging waste generated, by packaging material, EU, 2010–2021

(million tonnes)



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Figure 2: Packaging waste generated, by packaging material, EU, 2010–2021 (million tonnes) Source: Eurostat (env_waspac)

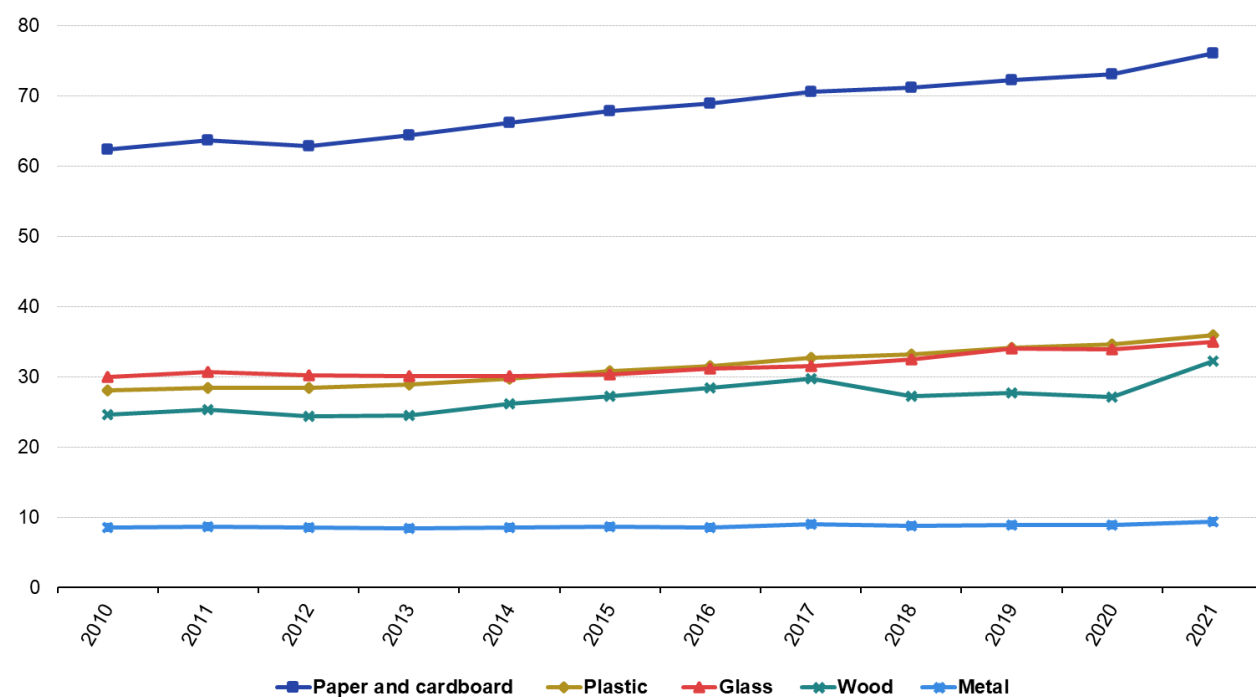
In 2021, the EU generated an estimated total volume of 84.3 million tonnes of packaging waste – an increase by 6.0 % (or 4.8 million tonnes) compared with 2020. The growth in 2021 was mainly due to an increase in waste from packaging made of wood by 2.3 million tonnes (+19.0 %). There was also a notable increase in waste from paper and cardboard packaging compared with 2020, up 1.3 million tonnes (+3.9 %). The increases in waste material was smaller for packaging made of plastic (up 598 thousand tonnes; 3.9 %), glass (up 467 thousand tonnes; 3.1 %) and metal (up 181 thousand tonnes; 4.5 %).

Over the 11-year period from 2010 to 2021, paper and cardboard was the main packaging waste material, contributing with 34.0 million tonnes to the total packaging waste generated in 2021; since 2010, this waste stream grew by 23.5 %. Plastic packaging reached a total of 16.1 million tonnes as the second most important packaging material (+29.9 % compared with 2010). Glass packaging waste had a volume of 15.6 million tonnes (+18.1 %), wood 14.4 million tonnes (+32.7 %) and metal packaging 4.2 million tonnes in 2021 (+10.6 %).

Figure 3 depicts the development in the quantity of waste generated per inhabitant, by main waste materials. Compared with the total volume of generated packaging waste per inhabitant in 2010, which was 154.0 kg, the total volume increased by 34.7 kg to reach 188.7 kg per inhabitant in 2021.

Packaging waste generated, by packaging material, EU, 2010–2021

(kg per capita)



Note: 2010, 2011, 2021: Eurostat estimates.

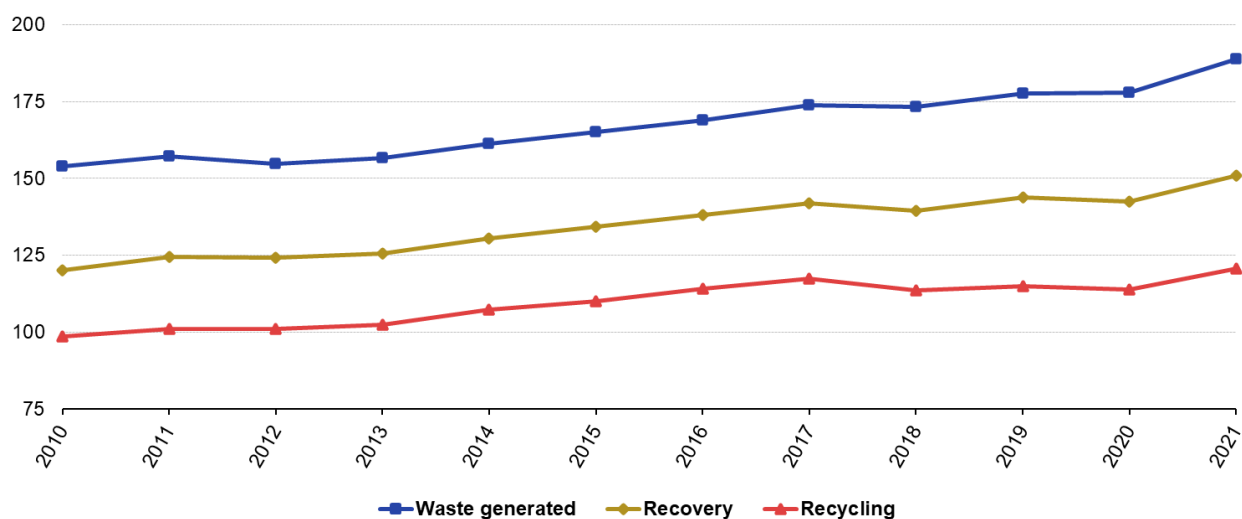
Source: Eurostat (online data code: env_waspac)



Figure 3: Packaging waste generated by packaging material, EU, 2010–2021 (kg per capita) Source: Eurostat (env_waspac)

Figure 4 shows the evolution of the volume of total packaging waste generated, recovered and recycled per inhabitant. In comparison to the previous year, the amount of packaging waste generated per inhabitant in 2021 increased by 6.1 %. In parallel, recovered and recycled packaging waste both increased by 6.0 %. Between 2010 and 2021, the amount of packaging waste generated per inhabitant increased substantially, by 22.5 %. The recycled volume increased at the same rate over this period, by 22.5 %, while the volume of recovered packaging waste grew even stronger, by 25.7 %.

Packaging waste generated, recovered and recycled, EU, 2010-2021 (kg per capita)



Note: 2010, 2011, 2021: Eurostat estimates.
Source: Eurostat (online data code: env_waspac)

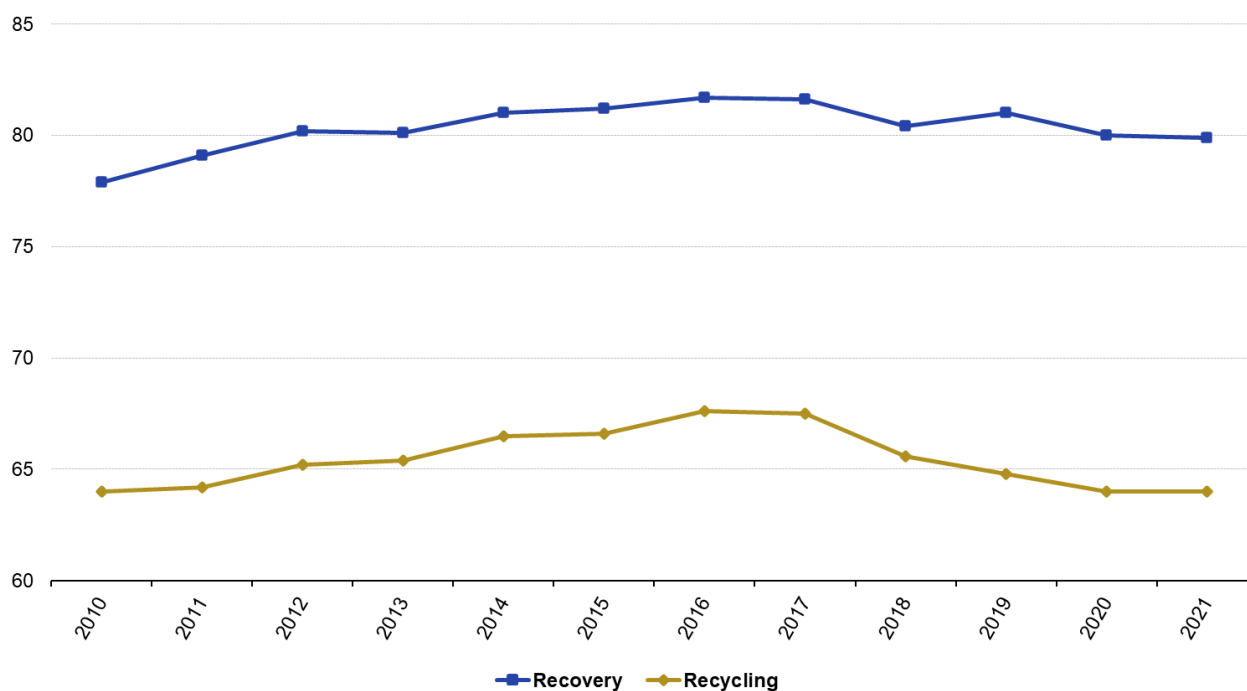
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Figure 4: Packaging waste generated, recovered and recycled, EU, 2010-2021 (kg per capita) Source: Eurostat (env_waspac)

Figure 5 shows the evolution in the corresponding EU recycling and recovery rates of packaging waste over the period 2010–2021. In both 2020 and 2021, the recycling rate of packaging waste stood at 64.0 %, the same level as in 2010. In every year between 2010 and 2020, the recycling rate lay above this level. It grew steadily from 2010 to reach a peak at 67.6 % in 2016, before falling in each following year until 2020. From 2010 to 2018, the recovery rate followed roughly the trend of the recycling rate. The recovery rate, including incineration at waste incineration plants with energy recovery, rose from 77.9 % in 2010 to its highest value within the period, 81.7 %, in 2016. In 2021, the recovery rate fell to 80.0 %, marginally lower than in 2020 (-0.1 percentage points).

Recycling and recovery rates of packaging waste, EU, 2010–2021

(%)



Note: 2010, 2011, 2021: Eurostat estimates.

Source: Eurostat (online data codes: env_waspac and env_waspacr)

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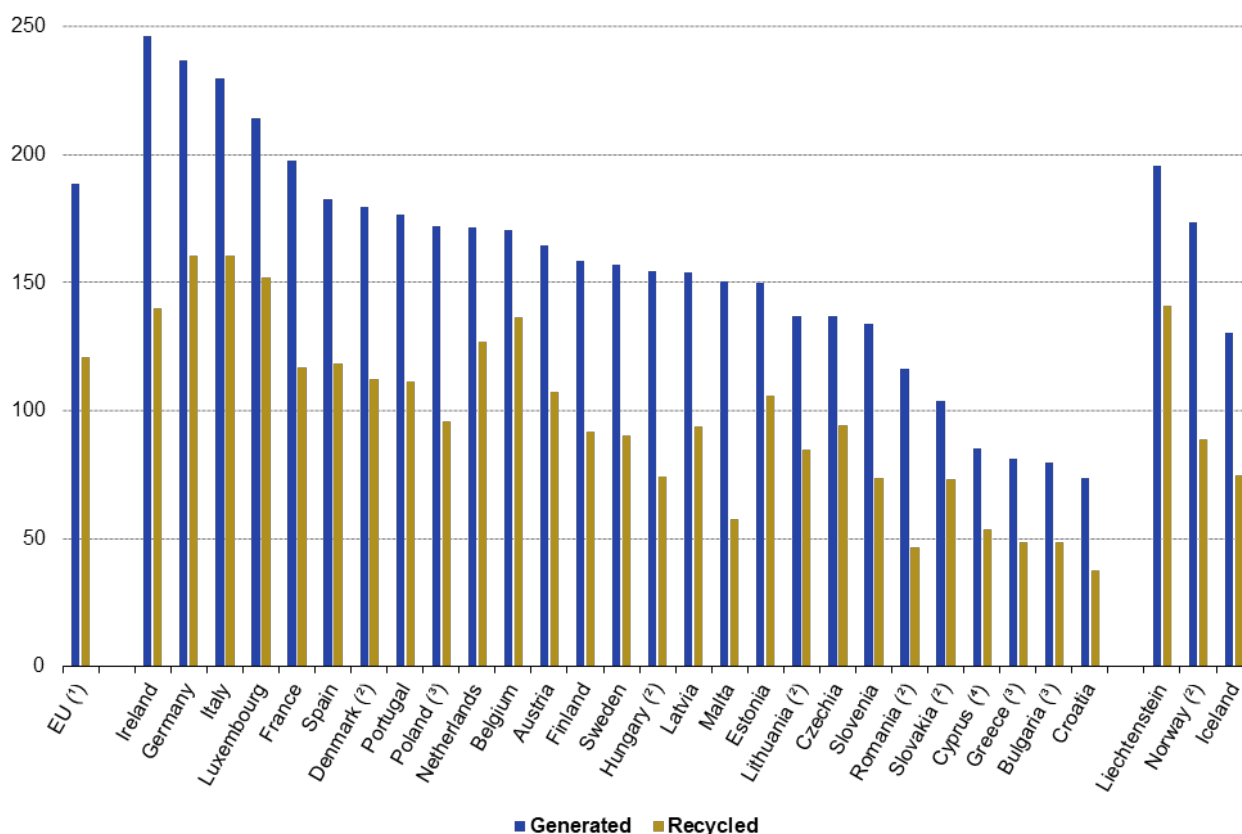
Figure 5: Recycling and recovery rates of packaging waste, EU, 2010–2021 (%) Source: Eurostat (env_waspac) and (env_waspacr)

Generation and recycling per inhabitant

The total amounts of packaging waste generated and recycled comprise all packaging materials: glass, paper and cardboard, metal, plastic, wood and others. Figure 6 gives an overview of the data reported on generation and recycling of packaging per inhabitant by the EU Member States and the [EEA](#) / [EFTA](#) countries in 2021. There were 150 kg or more packaging waste generated per inhabitant in 16 of the EU Member States. The amounts ranged from 246.1 kg per inhabitant in Ireland and 236.7 kg in Germany to 73.8 kg per inhabitant in Croatia. The highest amounts of recycled packaging waste per inhabitant were reported by Germany with 160.6 kg and Italy with 160.4 kg, while the lowest was recorded in Croatia with 37.5 kg.

Packaging waste generated and recycled, 2021

(kg per capita)



Note: ranked according to packaging waste generated.

(1) Eurostat estimates.

(2) 2020.

(3) 2019.

(4) Generated packaging waste is estimated.

Source: Eurostat (online data code: env_waspac)

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Figure 6: Packaging waste generated and recycled, 2021 (kg per capita) Source: Eurostat (env_waspac)

Recycling and recovery targets and rates

Article 6 of the [Packaging Waste Directive](#) sets out the recovery and recycling targets. The targets had to be met in 2008 for the first time for all countries.

The Packaging Waste Directive sets the following targets: a minimum of 60 % recovery rate (including waste incineration), and; between 55 % and 80 % of packaging waste to be recycled, with minimum rates of: 60 % for glass; 60 % for paper and cardboard; 50 % for metals; 22.5 % for plastics, and; 15 % for wood.

These targets are calculated according to weight, by dividing the amount of packaging waste recycled by the total amount of packaging waste generated. The recycling rate of plastic packaging waste counts exclusively material that is recycled back into plastic.

The recovery and recycling rates of all packaging waste of the EU Member States and the EEA/EFTA countries in 2021 are shown in Table 1. According to these data, Belgium had the highest recovery rate among the EU Member States, at 99.1 %, as well as the highest recycling rate, at 80.4 %.

Recovery and recycling rate of packaging waste, 2021

(%)

	Recovery rate	Recycling rate
EU ⁽¹⁾	79.9	64.0
Belgium	99.1	80.4
Netherlands	93.4	76.8
Luxembourg	97.5	73.7
Italy	79.6	72.9
Finland	94.6	72.5
Slovakia ⁽²⁾	74.1	70.8
Estonia	97.6	70.4
Spain	74.5	70.1
Czechia	77.1	69.1
Germany	96.3	67.9
Austria	94.7	65.8
Denmark ⁽²⁾	91.7	64.0
Cyprus	66.4	63.5
Portugal	70.4	63.1
France	75.7	61.8
Lithuania ⁽²⁾	69.8	61.8
Bulgaria ⁽³⁾	61.4	61.2
Latvia	65.2	61.0
Greece ⁽³⁾	60.1	60.1
Sweden	61.8	59.6
Ireland	89.0	58.1
Poland ⁽³⁾	59.9	55.5
Slovenia	79.3	55.1
Hungary ⁽²⁾	55.3	52.4
Croatia	51.4	50.8
Romania ⁽²⁾	42.5	39.9
Malta	38.5	38.4
Liechtenstein	93.6	72.2
Norway ⁽²⁾	85.9	52.5
Iceland	64.6	49.8

Note: ranked according to the recycling rate.

⁽¹⁾ Eurostat estimates.

⁽²⁾ 2020.

⁽³⁾ 2019.

Source: Eurostat (online data codes: env_waspac and env_waspacr)

Figure 7 shows the share of recovery options for all packaging waste in 2021. The main form of recovery is recycling in all of the reporting countries. In some countries, energy recovery from packaging waste contributed significantly to the overall recovery rate. It should be noted that due to methodological/technical issues, the sum of recycling, energy recovery and other recovery in Figure 7 may be different from the total recovery rates in Table 1 and may exceed 100 %.

Among the EU Member States, the highest energy recovery from packaging waste was recorded in Finland (36.7 %). In Greece, Malta and Bulgaria, there was no or only negligible energy recovery from packaging waste. Other forms of recovery contributed only a minor share, with a share of less than 0.6 % in all but three EU Member States (the highest at 5.0 % in Estonia).

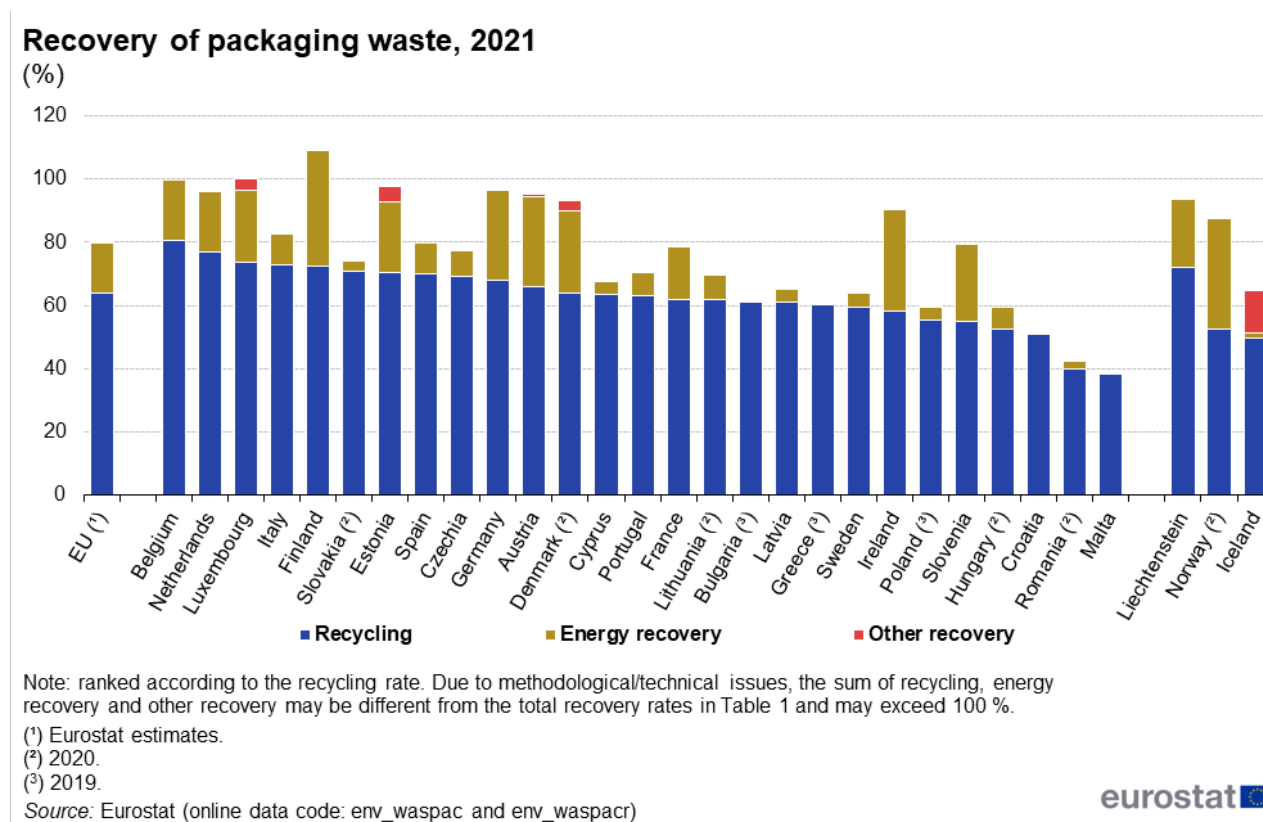
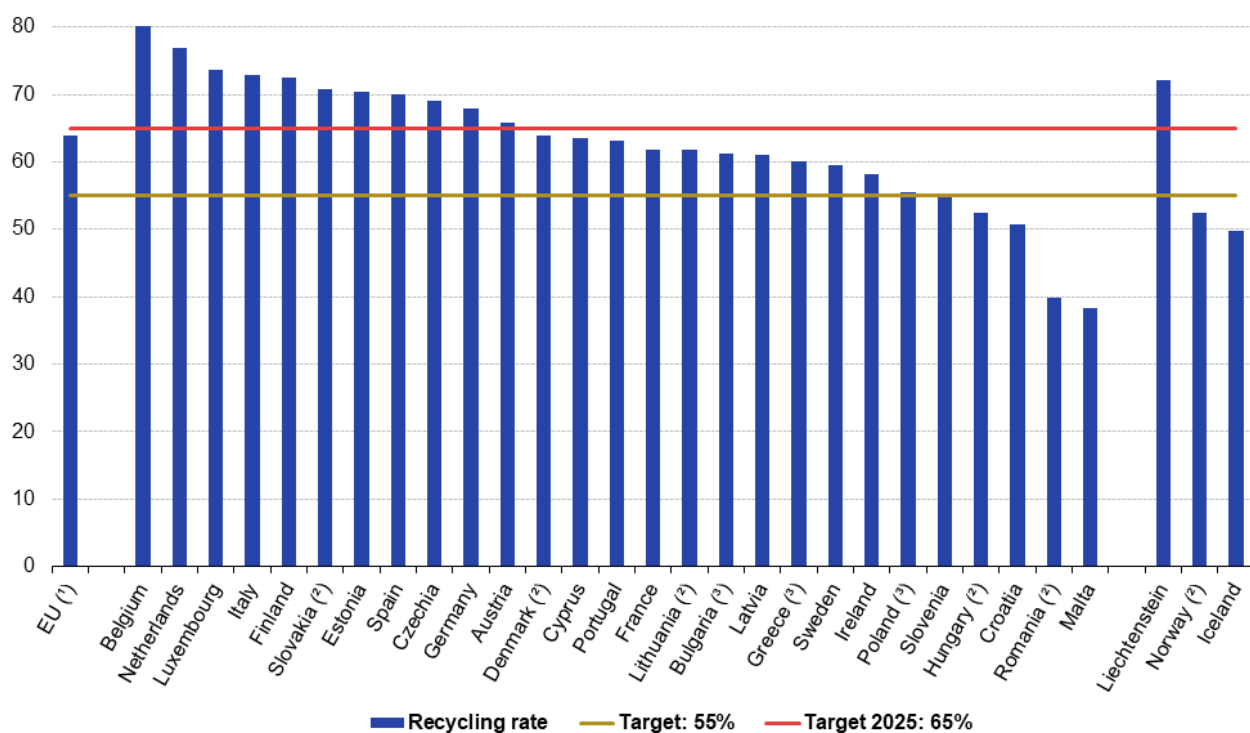


Figure 7: Recovery of packaging waste, 2021 (%) Source: Eurostat (env_waspac) and (env_waspacr)

Figure 8 shows the recycling rate of all packaging waste for the EU Member States and the EEA/EFTA countries in 2021. 'Recycling' covers material recycling and other forms of recycling (e.g. organic recycling). In 2021, the target of 55 % recycled packaging waste was met by all Member States except Hungary (52.4 %; 2020 data), Croatia (50.8 %), Romania (39.9 %; 2020 data) and Malta (38.4 %). From 2025, the recycling target is increased to 65 %. Eleven of the EU Member States already met this future target in 2021.

Recycling rate of packaging waste, 2021

(%)



(¹) Eurostat estimate.

(²) 2020.

(³) 2019.

Source: Eurostat (online data code: env_waspacr)

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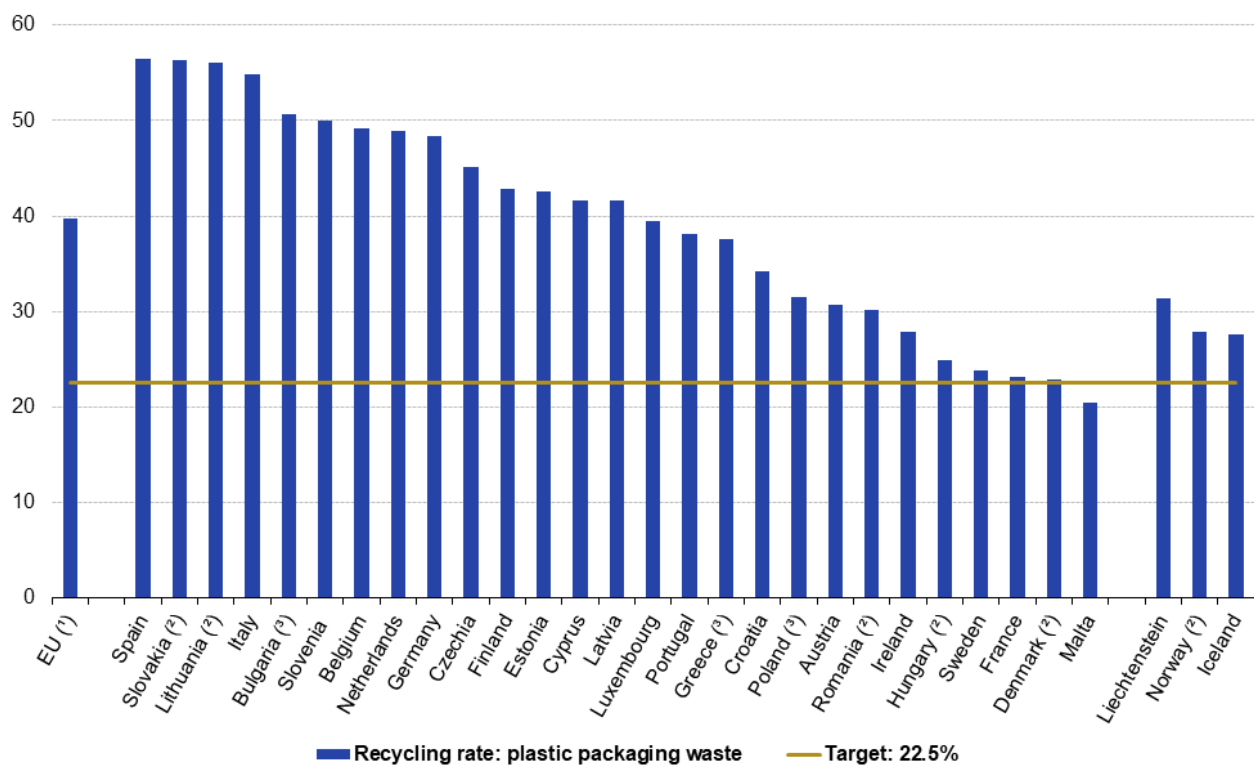
Figure 8: Recycling rate of packaging waste, 2021 (%) Source: Eurostat (env_waspacr)

Figure 9 shows the recycling rate of plastic packaging waste for the EU Member States and the EEA/EFTA countries in 2021. The recycling rate includes only material recycling and no other forms of recycling, i.e. exclusively material that is recycled back into plastics.

The target of 22.5 % recycled plastic packaging waste was met by all Member States except Malta (20.5 %) in 2021.

Recycling rate of plastic packaging waste, 2021

(%)



(*) Eurostat estimate.

(²) 2020.

(³) 2019.

Source: Eurostat (online data code: env_wasprac)

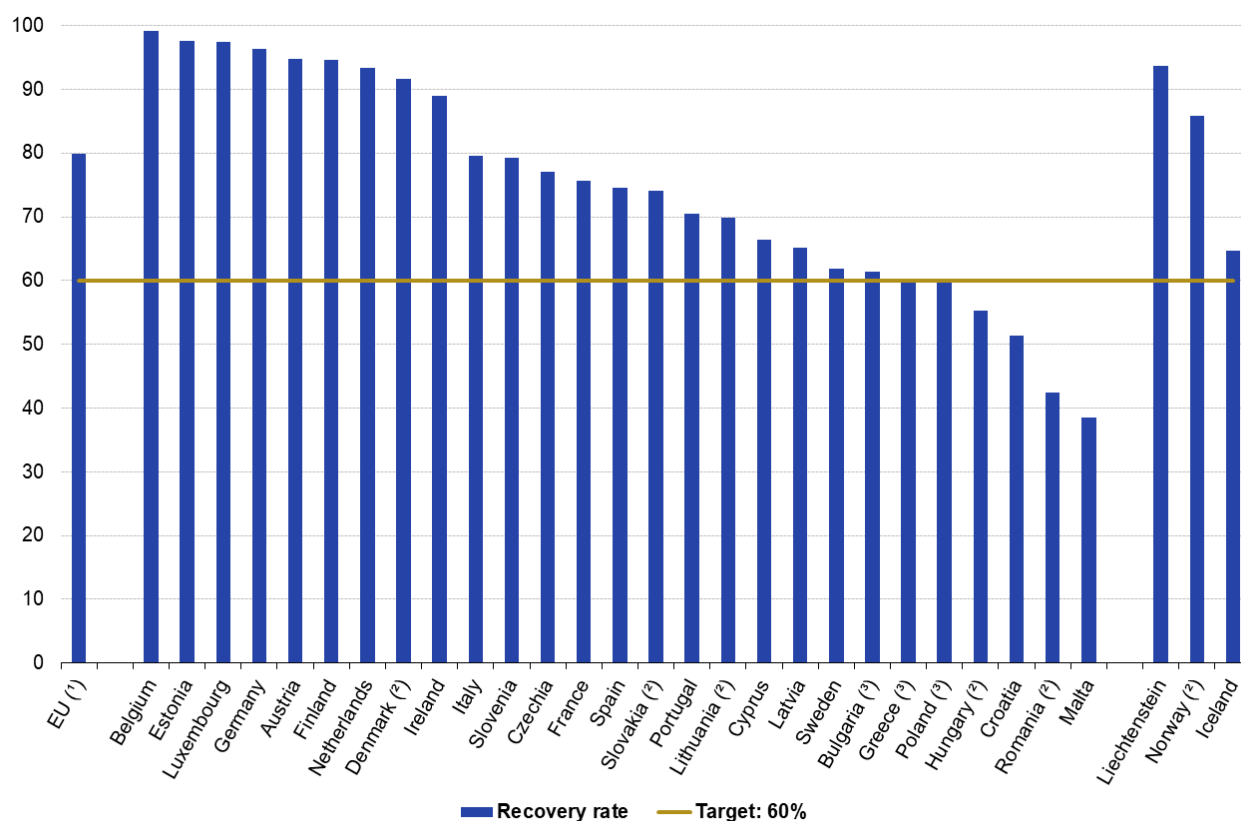
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Figure 9: Recycling rate of plastic packaging waste, 2021 (%) Source: Eurostat (env_wasprac)

Figure 10 shows the recovery rate of all packaging waste in 2021. All EU Member States and EEA/EFTA countries should have achieved the target of 60 %. Recovery includes energy recovery from packaging waste, other forms of recovery and total recycling. In 2021, the recovery rates were below the target of 60 % only in Poland (59.9 %; 2019 data), Hungary (55.3 %; 2020 data), Croatia (51.4 %), Romania (42.5 %; 2020 data) and Malta (38.5 %).

Recovery rate of packaging waste, 2021

(%)



(*) Eurostat estimate.

(²) 2020.

(³) 2019.

Source: Eurostat (online data code: env_waspac)

eurostat

Figure 10: Recovery rate of packaging waste, 2021 (%) Source: Eurostat (env_waspac)

Conclusions

- The amount of packaging waste generated in the EU increased overall during the period 2010-2021. In 2021, the amount of packaging waste generated grew further, continuing the overall upward trend observed since 2012 with only a slight exception in 2018.
- Over the period 2010–2021, the generation of all types of packaging waste material increased, although to a different extent. The highest relative increases were observed for wooden packaging waste, followed by plastic and paper and cardboard. In absolute amounts, paper and cardboard packaging waste increased the most.
- The recycling rate for packaging waste rose continuously from 2010 to 2016, before falling back to the 2010 level in 2020 and 2021.

Source data for tables and figures on this page (MS Excel)

- [Packaging waste - Excel file - October 2023](#)

Data sources

The packaging waste data are reported by the EU Member States as laid down in Commission Decision 2005/270/EC. The reported data are usually available in the [Eurostat database on waste](#) approximately 20 months after the end of the reference year.

Context

As a first legal basis, [Council Directive 85/339/EEC](#) of June 1985 required the establishment of national programs for the reduction in the volume of beverage containers disposed as waste in order to raise consumer awareness of the advantage of using refillable containers. The directive was repealed by the introduction of the [European Parliament and Council Directive 94/62/EC](#) of 20 December 1994 on packaging and packaging waste (Packaging Waste Directive). This directive aims at harmonising national measures concerning the management of packaging and packaging waste and lays down measures aimed, as a first priority, at preventing the production of packaging waste and, as additional fundamental principles, at:

- reusing packaging;
- recycling; and
- implementing other forms of recovering packaging waste hence reducing the final disposal of such waste.

It also limits the level of heavy metals in packaging.

Latest legal acts: [Directive \(EU\) 2018/852](#) amending [Directive 94/62/EC](#) on packaging and packaging waste (Packaging Waste Directive).

- [Commission Implementing Decision 2019/665](#) amending [Commission Decision 2005/270/EC](#) applies from reference year 2018.

Definitions

Packaging is defined as any material that is used to contain, protect, handle, deliver or present goods. Packaging waste can arise from a wide range of sources including supermarkets, retail outlets, manufacturing industries, households, hotels, hospitals, restaurants and transport companies. Items like glass bottles, plastic containers, aluminium cans, food wrappers, timber pallets and drums are all classified as packaging.

Article 3 and Annex I of the Packaging Waste Directive specify 'packaging' in further detail.

The main packaging materials are glass, paper and cardboard, plastics, metals (aluminium and steel) and wood.

Composite materials are made of paper, plastic and metal which could not be separated by hand. Composites are reported under their predominant material by weight. Other packaging materials are counted as 'others'.

Recovery includes recycling, energy recovery and other forms of recovery. Annex II of the [Waste Framework Directive 2008/98/EC \(consolidated version\)](#) defines energy recovery and other forms of recovery.

The weight of recovered or recycled packaging waste shall be the input of packaging waste to an effective recovery or recycling process. If the output of a sorting plant is sent to effective recycling or recovery processes without significant losses, it is acceptable to consider this output to be the weight of recovered or recycled packaging waste. The weight should exclude non-packaging materials as far as practical.

Reusable packaging is only counted once in its lifetime and not after every refilling and purchase trip.

The recovery rates are the total quantity of recovered materials divided by the total quantity of generated packaging waste.

The recycling rates are usually the total quantity of recycled materials divided by the total quantity of generated packaging waste, except in some cases. The data set 'Recycling rates of packaging waste for monitoring compliance with policy targets, by type of packaging (env_waspacr)' includes, for two types of waste material (plastic and wood), 'Adjusted recycling rate'. That means the recycling rates adjusted for monitoring compliance with policy targets in accordance with Article 6 of Directive 94/62/EC and Article 6b(1) of Decision 2005/270. The relevant rates for those materials are:

- Recycling rate of plastic packaging waste counts exclusively material that is recycled back into plastic (material recycling / generation).

- Recycling rate of wooden packaging waste is calculated including repair (recycling + repair of wooden packaging waste / generation + repair of wooden packaging waste).

See also

- [Waste statistics](#)
- [Consumption of plastic carrier bags - estimates](#)
- [End-of-life vehicle statistics](#)
- [Food waste and food waste prevention - estimates](#)
- [Municipal waste statistics](#)
- [Recycling – secondary material price indicator](#)
- [Waste management indicators](#)
- [Waste shipment statistics](#)
- [Waste statistics - electrical and electronic equipment](#)
- [Waste statistics - recycling of batteries and accumulators](#)

Publications

- [All publications on waste](#) issued by Eurostat.
- [Energy, transport and environment statistics - 2020 edition](#)

Main tables

- [Waste statistics](#) , see:

Waste streams (t_env_wasst)

[Recovery rates for packaging waste \(ten00062\)](#)

[Recycling rates for packaging waste \(ten00063\)](#)

Database

- [Waste](#) , see:

Waste (env_was)

Waste streams (env_wasst)

[Packaging waste by waste management operations \(env_waspac\)](#)

[Recycling rates of packaging waste for monitoring compliance with policy targets, by type of packaging \(env_waspacr\)](#)

Dedicated section

- [Eurostat website: dedicated section on waste statistics](#)

Methodology

- [Packaging waste](#) (ESMS metadata file — env_waspac_esms)
- [Guidance on packaging and packaging waste](#)

Legislation

- [Directive 94/62/EC](#) of the European Parliament and of the Council of 20 December 1994 on packaging and packaging waste (consolidated version)
- [Commission Decision 2005/270/EC](#) of 22 March 2005 establishing the formats relating to the database system pursuant to [Directive 94/62/EC of the European Parliament and of the Council](#) of 20 December 1994 on packaging and packaging waste
- [Directive \(EU\) 2018/852 of the European Parliament and of the Council](#) of 30 May 2018 on packaging and packaging waste
- [Commission Implementing Decision \(EU\) 2019/665](#) of 17 April 2019 amending Decision 2005/270/EC establishing the formats relating to the database system pursuant to European Parliament and Council Directive 94/62/EC on packaging and packaging waste (notified under document C(2019) 2805) (Text with EEA relevance.)

External links

- [European Commission — Environment — Packaging waste](#)
- [European Environment Agency — Circular economy](#) and [Waste and recycling](#)