Plastics – the Facts 2022

OCTOBER 2022
Plastics – the Facts is an analysis of the latest data related to plastics production, demand, conversion and waste management in Europe. It also provides information on key figures of the European plastics industry. In short, this report gives an insight into the industry’s contribution to European society.
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Foreword

Welcome to the 2022 edition of “Plastics - the Facts”!

This year’s data confirms that after a turbulent period, global plastics manufacturing is bouncing back. In 2021 global production rose 4% to more than 390 million tonnes demonstrating the strong and continuing demand for plastics.

However, in Europe in particular, there are challenges ahead. Our latest data show that China’s share of global plastics production continues to grow (reaching 32% in 2021) while Europe’s share – which reached 57.2 million tonnes in 2021 – continues to decline (hitting 15%). This confirms a loss of competitiveness that could be exacerbated further by energy and logistics crises resulting from the war in Ukraine and the ongoing COVID pandemic.

Virginia Janssens, Managing Director Plastics Europe
The European plastics manufacturing industry is in transition. Every week I witness our member companies investing huge amounts of capex, time, energy, imagination, and expertise to meet our 2050 net zero and circularity targets sustainably. Our members are undertaking huge investments and a far-reaching reorganisation of their production and technology base. In so doing they are seeking ways to solve issues like plastics waste and climate change, while continuing to offer its various value chains, consumers and society the many benefits that plastics offer.

At Plastics Europe we are evolving too. Every day, we strive to be the catalyst for the industry to contribute to the goals of international climate agreements such as the COP and the EU’s Green Deal.

To support this effort, an independent report, commissioned by Plastics Europe and called “Reshaping Plastics: pathways to a circular, climate neutral plastics system in Europe”, was published in April this year. A living roadmap is now also being developed by Plastics Europe and its members, setting out concrete milestones, actions and KPIs to track progress on our transformation journey, also enhancing value chain collaboration.

To help monitor progress we need more reliable and comprehensive data. In this edition of “Plastics – the Facts” we have therefore included production and demand data for biobased, bio-attributed and post-consumer recycled plastics for the first time.

Plastics Europe recognizes that to transition to net zero by 2050, faster systemic change and more intense and effective collaboration between all parts of the European plastics’ system and policy makers are essential. We also need a new and enabling policy framework that better incentivises investment and innovation by fostering a climate of creative competition in a circular economy for plastics.

I am very proud of the progress that we have made as an industry over the past year and look forward to deepen collaboration with all stakeholders to keep the European industry globally competitive as the EU transitions to net zero and circularity.
Notice to the reader


A more exhaustive analysis of plastics progress towards circularity in Europe is available in the “The Circular Economy of Plastics – A European Overview” report.

The data presented in this report was collected by Plastics Europe (the pan-European association of plastics manufacturers) and EPRO (the European Association of Plastics Recycling and Recovery Organisations). Plastics Europe’s members, gathered in the Plastics Europe’s Market Research Group (PEMRG), provided input on the plastics demand by converters. Conversio Market & Strategy GmbH helped assess plastics production and conversion, waste collection and treatment data. Official statistics from European or national authorities and waste management organisations have been used, where available. Research or expertise from consultants completed gaps. Figures cannot always be directly compared with those of previous years due to changes in estimates.

All figures and graphs in this report show data for EU27 plus Norway, Switzerland and the United Kingdom, which is referred to as Europe for the purposes of abbreviation – other country groups are explicitly listed.

Data presented in this report cover thermoplastics and thermosets. As for the previous Plastics – the Facts editions, polymers used for textiles, paints, varnishes, textiles waterproofing, or within the production of cosmetics, medicines or chemical processes are not included in the scope of the data. PVC-, PO- and PU-fibers are included, whereas PA-fibers, PET-, PBT-, or Acrylic polyesters are not included.

Data presented in this report are rounded estimations (except Eurostat data)
New data and definitions

With the view of generating data that can help to address today’s sustainability challenges, and to ensure comparability and coherence with other reports and studies, Plastics Europe has reviewed some concepts’ definitions and the scope of its datasets.

For this edition of Plastics – the Facts, new figures and graphs were developed for the global and European plastics production*. As from 2021 data, production figures will be shown by type of feedstock: i.e. fossil-based, post-consumer recycled or bio-based/bio-attributed plastics production.

For 2021, data on post-consumer recycled plastics use by converters has also been added.

Polymers that are not used in the conversion of plastics parts and products (i.e. quantities used for adhesives, sealants, coatings, paints, varnishes, textiles waterproofing, or within the production of cosmetics, medicines or chemical processes) are now excluded from the scope of the production, demand, conversion and end-of-life management data.

Those changes explain data differences with the previous editions of Plastics – the Facts.

For a more exhaustive analysis of plastics progress towards circularity, please consult Plastics Europe’s report *The Circular Economy of Plastics – A European Overview.*

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*Including plastics production from polymerisation and production of mechanically recycled plastics.
The Circularity of Plastics

The circular and climate neutral plastics economy is a system in which plastics are produced, converted, used and managed in a sustainable way.

5.5 Mt post-consumer recycled plastics were used in new products and parts in the EU27+3 in 2021, representing about 10% recycled content rate in plastics conversion, and an increase of about 20% compared to 2018.

Today, most plastics are still produced from fossil-based feedstock. Transitioning to a circular, climate neutral economy demands investment and innovation from the plastics value chain to develop new business models for reuse, produce more recycled plastics and new feedstocks that are less dependent on fossil-based oil and gas. Plastics Europe continues working towards improving knowledge and data on plastics circularity.
1. Does not include elastomers, adhesives, coatings and sealants. 2. Pre-consumer plastics waste is mainly originating from the plastics conversion and from plastics production (polymerisation) to a lesser extend. 3. Compounding of recycled plastics and plastics from polymerisation may occur prior conversion. 4. Includes chemical recycling. 5. Process losses are usually sent to energy recovery or landfill. Parts of plastics residues could be a potential future source of chemical recycling.
Contribution to European society
“An industry employing more than 1.5 million people across the European Union”
The European plastics industry: key figures

The European plastics industry includes plastics manufacturers, converters, recyclers and machinery manufacturers.

>1.5 million employment*

In 2021, the plastics industry gave direct employment to more than 1.5 million people in the European Union, a small increase compared to 2020.

>52,000 companies*

An industry with over 52,000 companies, most of them SME’s, distributed across the European Union.

>400 billion € turnover*

The European plastics industry (EU27) had a turnover of approximately 405 billion euros in 2021.

*2021 Plastics Europe estimations – Eurostat official data only available until 2019.
More than 10 millions tonnes of post-consumer plastics waste were sent to recycling in 2020 in the EU27+3.

In 2021, about 5.5 million tonnes of post-consumer recycled plastics were reintroduced in the EU27+3 economy, an increase of about 20% compared to 2018.

The European plastics industry (EU27) had a positive trade balance of 14.4 billion euros in 2021.

The European plastics industry (EU27) ranks 8th in Europe in industrial value-added contribution**, positioned after the manufacturing of electrical equipment.

* 2021 Plastics Europe estimations – Eurostat official data only available until 2019.
** Measured by value added at factor cost, 2019.
World plastics data
“Global plastics production bouncing back in 2021 after a turbulent period ”
After a stagnation in 2020 due to the Covid-19 pandemic, the global plastics production increased to 390.7 million tonnes in 2021.

Sources: Conversio Market & Strategy GmbH and nova-Institute
The above data are rounded estimations
*Including plastics production from polymerisation and production of mechanically recycled plastics
Polymers that are not used in the conversion of plastic parts and products (i.e. for textiles, adhesives, sealants, coatings, etc.) are not included
1. Includes fossil-based thermoplastics, thermosets and PUR
2. Data on post-consumer recycled plastics had been developed in 2018, data for other years are estimations
For the first time, Plastics - the Facts presents World plastics production data excluding polymers that are not used in the conversion of plastic parts and products (i.e. for adhesives, sealants, coatings, paints, varnishes, or within the production of cosmetics, medicines or chemical processes). Post-consumer recycled and bio-based/bio-attributed plastics production quantities are included for the first time.

As in previous editions, quantities used for textiles or textiles waterproofing, are excluded. The scope includes thermoplastics and thermosets.
World plastics production* in 2021

In 2021, 90.2% of the World plastics production was fossil-based. Post-consumer recycled plastics and bio-based/bio-attributed plastics respectively accounted for 8.3% and 1.5% of the World plastics production.

390.7 Mt in 2021

Sources: Conversio Market & Strategy GmbH and nova-institute

The above data are rounded estimations
Polymers that are not used in the conversion of plastic parts and products (i.e. for textiles, adhesives, sealants, coatings, etc.) are not included
*Including plastics production from polymerisation and production of mechanically recycled plastics
1. nova-Institute 2022; data for bio-based structural polymers, preliminary estimations for 2021
In 2021, China reached almost one third of the World’s plastics production.

<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage 2017</th>
<th>Percentage 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>18% - 18%</td>
<td>18% - 18%</td>
</tr>
<tr>
<td>EU27+3</td>
<td>19% - 15%</td>
<td>15% - 15%</td>
</tr>
<tr>
<td>China</td>
<td>29% - 32%</td>
<td>29% - 32%</td>
</tr>
<tr>
<td>Middle East, Africa</td>
<td>7% - 8%</td>
<td>7% - 8%</td>
</tr>
<tr>
<td>Rest of Asia</td>
<td>17% - 17%</td>
<td>17% - 17%</td>
</tr>
<tr>
<td>Japan</td>
<td>4% - 3%</td>
<td>4% - 3%</td>
</tr>
<tr>
<td>Latin America</td>
<td>4% - 4%</td>
<td>4% - 4%</td>
</tr>
<tr>
<td>CIS</td>
<td>2% - 3%</td>
<td>2% - 3%</td>
</tr>
</tbody>
</table>

Global plastics production in 2021: 390.7 Mt

Sources: Conversio Market & Strategy GmbH and nova-institute
The above data are rounded estimations
Polymers that are not used in the conversion of plastic parts and products (i.e. for textiles, adhesives, sealants, coatings, etc.) are not included
*Including plastics production from polymerisation and production of mechanically recycled plastics
**Only thermoplastics and PUR

1. Canada, Mexico and the United States
2. Commonwealth of Independent States: Azerbaijan, Armenia, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Uzbekistan and Ukraine
Distribution of the global plastics production* by type

In 2021, circular plastics represented about 9.8% of the World plastics production.

Sources: Conversio Market & Strategy GmbH and nova-Institute
The above data are rounded estimations
Polymers that are not used in the conversion of plastic parts and products (i.e. for textiles, adhesives, sealants, coatings, etc.) are not included
*Including plastics production from polymerisation and production of mechanically recycled plastics
1. Includes PBT, PEEK, PEI, POM, PPA, PSU/PES/PPSU, PTFE, PVDF and other thermoplastics not listed separately
In 2021, packaging and building & construction applications were the two largest World plastics markets.

Distribution of the global plastics use by application

- Packaging: 44%
- Building & Construction: 18%
- Others: 12%
- Automotive: 8%
- Electrical & Electronics: 7%
- Household, Leisure & Sports: 7%
- Agriculture, Farming and Gardening: 4%

390.7 Mt in 2021

Sources: Conversio Market & Strategy GmbH
The above data are rounded estimations
*Polymers that are not used in the conversion of plastic parts and products (i.e. for textiles, adhesives, sealants, coatings, etc.) are not included.
European plastics data
“The European plastics industry is in transition to meet its 2050 net zero and circularity targets”
European plastics production* evolution

After a decrease in 2020 due to the Covid-19 pandemic, the European production increased to 57.2 million tonnes in 2021.

Sources: Conversio Market & Strategy GmbH, nova-Institute, Polyglobe database by Kunststoff Information Verlagsgesellschaft mbH, Eurostat (European Statistical Office)
2018-2020 production quantities have been calculated based on the development of Eurostat production indices
The above data are rounded estimations
Polymers that are not used in the conversion of plastic parts and products (i.e. for textiles, adhesives, sealants, coatings, etc.) are not included
*Including plastics production from polymerisation and production of mechanically recycled plastics
1. Includes fossil-based thermoplastics, thermosets and PUR used for plastic parts and products
2. Data on recycled plastics in the EU27+ 3 had been developed in 2018 and 2020, data for other years are estimations
For the first time, Plastics - the Facts presents European plastics production data excluding polymers that are not used in the conversion of plastic parts and products (i.e. for adhesives, sealants, coatings, paints, varnishes, textiles waterproofing, or within the production of cosmetics, medicines or chemical processes). Post-consumer recycled and bio-based/bio-attributed plastics production quantities are included for the first time.

As in previous editions, quantities used for textiles or textiles waterproofing are excluded. The scope includes thermoplastics and thermosets.

*Including plastics production from polymerisation and mechanical recycling output*
In 2021, European plastics production reached 57.2 Mt. Post-consumer recycled plastics and bio-based/bio-attributed plastics respectively accounted for 10.1% and 2.3% of the European plastics production.

Sources: Conversio Market & Strategy GmbH and nova-Institute

The above data are rounded estimations.

Polymers that are not used in the conversion of plastic parts and products (i.e. for textiles, adhesives, sealants, coatings, etc.) are not included.

*Including plastics production from polymerisation and production of mechanically recycled plastics

1. nova-Institute 2022; data for bio-based structural polymers, preliminary estimations for 2021
In 2021, circular plastics represented about 12.4% of the European plastics production.

57.2 Mt European plastics production* in 2021

Sources: Conversio Market & Strategy GmbH, nova-Institute, Polyglobe database by Kunststoff Information Verlagsgesellschaft mbH, Eurostat (European Statistical Office)

The above data are rounded estimations.

Polymers that are not used in the conversion of plastic parts and products (i.e. for textiles, adhesives, sealants, coatings, etc.) are not included.

*Including plastics production from polymerisation and production of mechanically recycled plastics

1. Includes PBT, PEEK, POM, PPA, PSU/PES/PPSU, PTFE, PVDF and other thermoplastics not listed separately.
50.3 Mt
European plastics converters demand

Plastics – the Facts’ European plastics converters demand data excludes polymers that are not used in the conversion of plastic parts and products (i.e. for textiles, adhesives, sealants, coatings, paints, varnishes, textiles waterproofing, or within the production of cosmetics, medicines or chemical processes). European converters demand data in Plastics – the Facts do not include recycled and bio-based/bio-attributed plastics due to limited data availability. The scope includes thermoplastics and thermosets.

Demand data are built on estimations of quantities bought by European converters, including imports.

Source: Conversio Market & Strategy GmbH based on the input of the Plastics Europe Market Research Group (PEMRG)
The above data are rounded estimations
European plastics converters demand by countries

Countries with more than 3 Mt plastics converters demand

50.3 Mt

European plastics converters demand in 2021

Source: Conversio Market & Strategy GmbH based on the input of the Plastics Europe Market Research Group (PEMRG)

The above data are rounded estimations

Demand for recycled plastics and bio-based/bio-attributed plastics is not included. Polymers that are not used in the conversion of plastic parts and products (i.e. for textiles, adhesives, sealants, coatings, etc.) are not included.
European plastics converters demand by countries

50.3 Mt

European plastics converters demand in 2021

Countries with less than 0.5 Mt plastics converters demand

Source: Conversio Market & Strategy GmbH based on the input of the Plastics Europe Market Research Group (PEMRG)

The above data are rounded estimations.

Demand for recycled plastics and bio-based/bio-attributed plastics is not included. Polymers that are not used in the conversion of plastic parts and products (i.e. for textiles, adhesives, sealants, coatings, etc.) are not included.
Evolution of the plastics converters demand (EU27+3)

In 2021, converters plastics demand increased for the first time after two years of decrease.

Source: Conversio Market & Strategy GmbH based on interviews with converters
The above data are rounded estimations.
Demand data are built on estimations of quantities bought by European converters, including imports.
Demand for recycled plastics and bio-based/bio-attributed plastics is not included. Polymers that are not used in the conversion of plastic parts and products (i.e. for textiles, adhesives, sealants, coatings, etc.) are not included.
European plastics converters demand by polymer type

Source: Conversio Market & Strategy GmbH based on the input of the Plastics Europe Market Research Group (PEMRG)

The above data are rounded estimations

Demand for recycled plastics and bio-based/bio-attributed plastics is not included

Plastics - the Facts figures on PA only cover PA6 and PA66

Source: Plastics Europe Market Research Group (PEMRG)
In 2021, packaging and building & construction by far represented the largest end-use markets for plastics in the EU27+3. The third biggest end-use market is the automotive sector.

Source: Conversio Market & Strategy GmbH based on the input of the Plastics Europe Market Research Group (PEMRG)

The above data are rounded estimations.
Demand data are built on estimations of quantities bought by European converters, including imports.
Demand for recycled plastics and bio-based/bio-attributed plastics is not included. Polymers that are not used in the conversion of plastic parts and products (i.e. for textiles, adhesives, sealants, coatings, etc.) are not included.
European plastics converters demand by type

In 2021, almost half of the European plastics converters demand was represented by polyolefins.

Source: Conversio Market & Strategy GmbH based on the input of the Plastics Europe Market Research Group (PEMRG)

The above data are rounded estimations.
Demand data are built on estimations of quantities bought by European converters, including imports. Demand for recycled plastics and bio-based/bio-attributed plastics is not included. Polymers that are not used in the conversion of plastic parts and products (i.e. for textiles, adhesives, sealants, coatings, etc.) are not included.
European plastics converters demand by application and type

Source: Conversio Market & Strategy GmbH based on the input of the Plastics Europe Market Research Group (PEMRG)

The above data are rounded estimations.

Demand data are built on estimations of quantities bought by European converters, including imports.

Demand for recycled plastics and bio-based/bio-attributed plastics is not included. Polymers that are not used in the conversion of plastic parts and products (i.e., for textiles, adhesives, sealants, coatings, etc.) are not included.

Numbers behind this graph are available upon request.

Plastics - the Facts figures on PA only cover PA6 and PA66.
European post-consumer recycled plastics use reached 9.9% in 2021

In 2021, the use of post-consumer recycled plastics by European converters reached 5.5 Mt, representing a 9.9% recycled content. This represents an increase of about 20% compared to 2018.

Source: Conversio Market & Strategy GmbH based on interviews with European plastics converters.

The above data are rounded estimations.

Data on the use of bio-based/bio-attributed plastics by European converters is not included. Polymers that are not used in the conversion of plastic parts and products (i.e. for textiles, adhesives, sealants, coatings, etc.) are not included.

Data on the use of the plastics by European converters differs from the plastics converters demand data. This is explained by different scopes (recycled plastics excluded in the demand figures). Process loss in conversion were also taken into account in the use of fossil-based plastics by converters.
Post-consumer recycled content in 2021

RECYCLED CONTENT IN NEW PRODUCTS

<table>
<thead>
<tr>
<th>Category</th>
<th>Recycled Content in 2018</th>
<th>Recycled Content in 2020</th>
<th>Recycled Content in 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRICULTURE, FARMING &amp; GARDENING</td>
<td>7.2% (4 Mt)</td>
<td>8.5% (4.6 Mt)</td>
<td>9.9% (5.5 Mt)</td>
</tr>
<tr>
<td>BUILDING &amp; CONSTRUCTION</td>
<td></td>
<td></td>
<td>25.4% (592 kt)</td>
</tr>
<tr>
<td>PACKAGING</td>
<td></td>
<td></td>
<td>18.1% (2,364 kt)</td>
</tr>
<tr>
<td>AUTOMOTIVE</td>
<td>2.9% (128 kt)</td>
<td></td>
<td>8.5% (1,836 kt)</td>
</tr>
<tr>
<td>ELECTRICAL &amp; ELECTRONICS</td>
<td>3.2% (106 kt)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HOUSEWARE, LEISURE &amp; SPORTS</td>
<td>9.9% (5,496 kt)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OTHERS</td>
<td></td>
<td></td>
<td>20.3% (2,364 kt)</td>
</tr>
</tbody>
</table>

Source: Conversio Market & Strategy GmbH based on interviews with European plastics converters
The above data are rounded estimations.
Data on the use of bio-based/bio-attributed plastics by European converters is not included.
Polymers that are not used in the conversion of plastic parts and products (i.e. for textiles, adhesives, sealants, coatings, etc.) are not included.
In 2021, post-consumer recycled content continued to grow in the agriculture, building & construction and packaging sectors.

Source: Conversio Market & Strategy GmbH based on interviews with European plastics converters. The above data are rounded estimations.

Data on the use of bio-based/bio-attributed plastics by European converters is not included. Polymers that are not used in the conversion of plastic parts and products (i.e. for textiles, adhesives, sealants, coatings, etc.) are not included.
In 2021, the European plastics industry achieved a positive trade balance of 14.4 billion euros.

14.4 billion €
trade balance

Source: Eurostat
* Official Eurostat denomination: Manufacture of plastics in primary forms
** Official Eurostat denomination: Manufacture of plastics products
Top extra EU trade partners (in value)

In 2021, the United States of America, United Kingdom and China were the top trade partners of the EU27 plastics industry.

Plastics production*

<table>
<thead>
<tr>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNITED STATES OF AMERICA</td>
<td>18.4%</td>
</tr>
<tr>
<td>SOUTH KOREA</td>
<td>11.3%</td>
</tr>
<tr>
<td>UNITED KINGDOM</td>
<td>10%</td>
</tr>
<tr>
<td>SAUDI ARABIA</td>
<td>9.2%</td>
</tr>
<tr>
<td>CHINA</td>
<td>8.7%</td>
</tr>
</tbody>
</table>

Plastics conversion**

<table>
<thead>
<tr>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHINA</td>
<td>35.8%</td>
</tr>
<tr>
<td>UNITED KINGDOM</td>
<td>11.4%</td>
</tr>
<tr>
<td>UNITED STATES OF AMERICA</td>
<td>11.2%</td>
</tr>
<tr>
<td>SWITZERLAND</td>
<td>7.2%</td>
</tr>
<tr>
<td>TURKEY</td>
<td>7.1%</td>
</tr>
</tbody>
</table>

Source: Eurostat

* Official Eurostat denomination: Manufacture of plastics in primary forms
** Official Eurostat denomination: Manufacture of plastics products
End-of-life management in EU27+3
“Plastics waste recycling rates are 13x higher when collected separately”
Mixed and separate post-consumer plastics waste collection in 2020

In 2020, 29.5 million tonnes of post-consumer plastics waste were collected in the EU27+3. Plastics waste recycling rates are 13x higher when collected separately compared to mixed waste collection schemes.

Source: Conversio Market & Strategy GmbH
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included.
The plastics packaging waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
Mixed waste collection: waste collection system in which end-users do not sort the different types of waste (e.g. household residual waste and municipal waste).
Separate waste collection: waste collection system in which end-users sort the different types of waste on a product level (e.g. household lightweight packaging, WEEE collection, container parks).
Between 2006–2020 plastics waste exports outside the EU27+UK have been reduced by 50%.

Plastics waste recycling rates are 13x Higher when collected separately compare to mixed collection schemes.

Source: Conversio Market & Strategy GmbH
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included.
Evolution of post-consumer plastics waste treatment (EU27+3)

Source: Conversio Market & Strategy GmbH
CAGR: Compound Annual Growth Rate
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included.
The plastics packaging waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
Recycling rates for plastic packaging waste are shown under the old plastic packaging recycling calculation methodology.
Post-consumer plastics waste management in 2020 (EU27+3)

In 2020, 35% of post-consumer plastics waste was sent to recycling.

23% Landfill
35% Recycling
42% Energy recovery

29.5 Mt in 2020

Source: Conversio Market & Strategy GmbH
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included.
The plastics packaging waste data used for the above graph were extrapolated based on 2018 available figures. The above data were rounded.
Recycling rates for plastic packaging waste are shown under the old plastic packaging recycling calculation methodology.
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included.
The plastics packaging waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.

1. Countries with landfill restrictions.

Recycling rates for plastic packaging waste are shown under the old plastic packaging recycling calculation methodology.

2020 Dutch plastics recycling included some quantities of plastics packaging waste collected in 2019, due to a fire in a local recycling facility in 2019.
Four countries have recycling rates above 40%:

- Netherlands
- Norway
- Spain
- Germany
Mixed and separate post-consumer plastics PACKAGING waste collection in 2020

In 2020, 17.9 million tonnes of post-consumer plastics packaging waste were collected in the EU27+3.

Plastics packaging waste recycling rates are 80x higher when collected separately compared to mixed waste collection schemes.

<table>
<thead>
<tr>
<th>Waste Collection</th>
<th>Recycling</th>
<th>Energy Recovery</th>
<th>Landfill</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed waste collection</td>
<td>1%</td>
<td>62%</td>
<td>37%</td>
<td>7.9 Mt</td>
</tr>
<tr>
<td>Separate waste collection</td>
<td>80%</td>
<td>18%</td>
<td>2%</td>
<td>10 Mt</td>
</tr>
</tbody>
</table>

Recycling rates for plastics packaging waste are shown under the old plastics packaging recycling methodology. The plastics packaging waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.

Mixed waste collection: waste collection system in which end-users do not sort the different types of waste (e.g. household residual waste and municipal waste).

Separate waste collection: waste collection system in which end-users sort the different types of waste on a product level (e.g. household lightweight packaging, WEEE collection, container parks).

Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included.
Plastics PACKAGING waste recycling rates are **80x** Higher when collected separately compare to mixed collection schemes.

Source: Conversio Market & Strategy GmbH
Post-consumer plastics PACKAGING waste management in 2020 (EU27+3)

In 2020, the overall European recycling rate for post-consumer plastics packaging reached 46% (under the former Packaging and Packaging Waste Directive calculation methodology), compared to 42% in 2018 – an increase of about 9.5%.

9.5% increase of plastics packaging recycling rate since 2018

17.9 Mt in 2020

17% Landfill

46% Recycling

37% Energy recovery

Source: Conversio Market & Strategy GmbH
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included.
Recycling rates for plastics packaging waste are shown under the old plastics packaging recycling methodology. The plastics packaging waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
Since 2006, post-consumer plastics PACKAGING recycling waste has more than doubled

The 2006-2020 plastics packaging waste recycling evolution in the EU27+3 showed a Compound Annual Growth Rate of 5.4%.

2006-2020 EVOLUTION

Recycling +110%

Energy recovery +76%

Landfill -57%

CAGR: Compound Annual Growth Rate
Source: Conversio Market & Strategy GmbH

Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included.

Recycling rates for plastics packaging waste are shown under the old plastics packaging recycling methodology. The plastics packaging waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
Post-consumer plastics PACKAGING waste treatment per country in 2020 (EU27+3)


Source: Conversio Market & Strategy GmbH
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included
1. Under the former point of calculation: Materials sent for recycling - Directive (EU) 94/62/EC

The plastics packaging waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
Recycling rates for plastic packaging waste are shown under the old plastic packaging recycling calculation methodology.
2020 Dutch plastics recycling included some quantities of plastics packaging waste collected in 2019, due to a fire in a local recycling facility in 2019.
End-of-life management in selected countries
“In 2020, four countries had plastics recycling rates above 40%”
Belgium • All plastics

From 2006 to 2020, the quantities sent to recycling increased by 69%, energy recovery increased by 19% and landfill decreased by 83%.

Post-consumer plastics waste treatment evolution 2006–2020 (in kt)

CAGR: Compound Annual Growth Rate
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included
Source: Conversio Market & Strategy GmbH
The plastics packaging consumption and waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
From 2006 to 2020, the quantities of post-consumer plastics packaging waste sent to recycling increased by +59%, energy recovery increased by 8% and landfill decreased by 100%.

CAGR: Compound Annual Growth Rate
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included
* From household, industrial and commercial packaging
Source: Conversio Market & Strategy GmbH

The plastics packaging consumption and waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
From 2006 to 2020, the quantities sent to recycling increased by 88%, energy recovery increased by 42% and landfill decreased by 20%.

**Post-consumer plastics waste treatment evolution 2006-2020 (in kt)**

- **Energy recovery** increased by 42%
- **Landfill** decreased by 20%
- **Recycling** increased by 88%

In 2020:
- **Energy recovery**: 1,672 kt (CAGR: 2.5%)
- **Landfill**: 929 kt (CAGR: -1.6%)
- **Recycling**: 1,189 kt (CAGR: 4.6%)

**2006-2020 EVOLUTION**

- **Recycling**: 495 to 1,189 kt (+88%)
- **Energy recovery**: 1,455 to 1,672 kt (+42%)
- **Landfill**: 3,760 to 887 kt (-20%)

CAGR: Compound Annual Growth Rate
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included
Source: Conversio Market & Strategy GmbH
The plastics packaging consumption and waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
From 2006 to 2020, the quantities of post-consumer plastics packaging waste sent to recycling increased by 45%, energy recovery increased by 32% and landfill decreased by 16%.

<table>
<thead>
<tr>
<th>Year</th>
<th>Recycling</th>
<th>Energy Recovery</th>
<th>Landfill</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>440 kt</td>
<td>796 kt</td>
<td>796 kt</td>
</tr>
<tr>
<td>2008</td>
<td>723 kt</td>
<td>790 kt</td>
<td>790 kt</td>
</tr>
<tr>
<td>2010</td>
<td>1,008 kt</td>
<td>621 kt</td>
<td>621 kt</td>
</tr>
<tr>
<td>2012</td>
<td>1,040 kt</td>
<td>670 kt</td>
<td>670 kt</td>
</tr>
<tr>
<td>2014</td>
<td>1,040 kt</td>
<td>670 kt</td>
<td>670 kt</td>
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<tr>
<td>2016</td>
<td>1,040 kt</td>
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<td>2020</td>
<td>1,040 kt</td>
<td>670 kt</td>
<td>670 kt</td>
</tr>
</tbody>
</table>

CAGR: Compound Annual Growth Rate
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included
*From household, industrial and commercial packaging
Source: Conversio Market & Strategy GmbH
The plastics packaging consumption and waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
From 2006 to 2020, the quantities sent to recycling increased by 104%, energy recovery increased by 67% and landfill decreased by 80%.

Post-consumer plastics waste treatment evolution 2006-2020 (in kt)

- **Recycling**: +104% (CAGR: 5.2%)
- **Energy recovery**: +67% (CAGR: 3.7%)
- **Landfill**: -80% (CAGR: -10.8%)

CAGR: Compound Annual Growth Rate
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included
Source: Conversio Market & Strategy GmbH
The plastics packaging consumption and waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
From 2006 to 2020, the quantities of post-consumer plastics packaging waste sent to recycling increased by 95%, energy recovery increased by 47% and landfill decreased by 93%.

2006–2020 EVOLUTION

- **Recycling**: +95%
- **Energy recovery**: +47%
- **Landfill**: -93%

CAGR: Compound Annual Growth Rate

Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included.

*From household, industrial and commercial packaging*

Source: Conversio Market & Strategy GmbH

The plastics packaging consumption and waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
From 2006 to 2020, the quantities sent to recycling increased by 77%, energy recovery increased by 58% and landfill decreased by 52%.

**Post-consumer plastics waste treatment evolution 2006–2020 (in kt)**

- **Recycling**: 2006-2020 (CAGR: 3.3%)
- **Energy recovery**: 2006-2020 (CAGR: 4.1%)
- **Landfill**: 2006-2020 (CAGR: -5.5%)

CAGR: Compound Annual Growth Rate
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included
Source: Conversio Market & Strategy GmbH
The plastics packaging consumption and waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
Post-consumer plastics PACKAGING* waste treatment treatment evolution 2006–2020 (in kt)

From 2006 to 2020, the quantities of post-consumer plastics packaging waste sent to recycling increased by 70%, energy recovery increased by 53% and landfill decreased by 83%.

2006–2020 EVOLUTION

Recycling +70%
Energy recovery +53%
Landfill -83%

2,209 kt in 2020

CAGR: Compound Annual Growth Rate
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included
*From household, industrial and commercial packaging
Source: Conversio Market & Strategy GmbH
The plastics packaging consumption and waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.

Italy · Plastics PACKAGING*

Post-consumer plastics PACKAGING* waste treatment treatment evolution 2006–2020 (in kt)
From 2006 to 2020, the quantities sent to recycling increased by 177%, energy recovery increased by 132% and landfill decreased by 18%.

Post-consumer plastics waste treatment evolution 2006-2020 (in kt)

CAGR: Compound Annual Growth Rate
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included
Source: Conversio Market & Strategy GmbH
The plastics packaging consumption and waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
Post-consumer plastics PACKAGING* waste treatment evolution 2006-2020 (in kt)

From 2006 to 2020, the quantities of post-consumer plastics packaging waste sent to recycling increased by 120%, energy recovery increased by x85 and landfill decreased by 42%.

2006-2020 EVOLUTION

Recycling: +120%
Energy recovery: +85,000%
Landfill: -42%

CAGR: Compound Annual Growth Rate
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included
*From household, industrial and commercial packaging
Source: Conversio Market & Strategy GmbH

The plastics packaging consumption and waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.

CAGR: Compound Annual Growth Rate
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included
*From household, industrial and commercial packaging
Source: Conversio Market & Strategy GmbH

The plastics packaging consumption and waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
From 2006 to 2020, the quantities sent to recycling increased by 137%, energy recovery increased by 73% and landfill decreased by 45%.

Post-consumer plastics waste treatment evolution 2006–2020 (in kt)

CAGR: Compound Annual Growth Rate
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included
Source: Conversio Market & Strategy GmbH
The plastics packaging consumption and waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
From 2006 to 2020, the quantities of post-consumer plastics packaging waste sent to recycling increased by 133%, energy recovery increased by 3.8% and landfill decreased by 43%.

CAGR: Compound Annual Growth Rate
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included
*From household, industrial and commercial packaging
Source: Conversio Market & Strategy GmbH
The plastics packaging consumption and waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
The Netherlands · All plastics

From 2006 to 2020, the quantities sent to recycling increased by 170%, energy recovery increased by 7% and landfill decreased by 98%.

**Post-consumer plastics waste treatment evolution** 2006–2020 (in kt)

- **Recycling**: 170% increase, 2006: 177 kt, 2020: 537 kt
- **Energy recovery**: 7% increase, 2006: 478 kt, 2020: 577 kt
- **Landfill**: 98% decrease, 2006: 1,058 kt, 2020: 2.5 kt

CAGR: Compound Annual Growth Rate
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included
Source: Conversio Market & Strategy GmbH
The plastics packaging consumption and waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
From 2006 to 2020, the quantities of plastics post-consumer packaging waste sent to recycling increased by 178%, energy recovery increased by 31% and landfill decreased by 100%.
From 2006 to 2020, the quantities sent to recycling increased by 175%, energy recovery increased by 657% and landfill decreased by 72%.

**2006–2020 EVOLUTION**

- **Recycling**: +175%
- **Energy recovery**: +657%
- **Landfill**: -72%

**Quantities in 2020**

- **All plastics**: 3,931 kt
- **Recycling**: 525 kt
- **Energy recovery**: 2,592 kt
- **Landfill**: 231 kt

**Post-consumer plastics waste treatment evolution 2006–2020 (in kt)**

CAGR: Compound Annual Growth Rate
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included
Source: Conversio Market & Strategy GmbH
The plastics packaging consumption and waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
The United Kingdom · Plastics PACKAGING*

Post-consumer plastics PACKAGING* waste treatment evolution 2006–2020 (in kt)

From 2006 to 2020, the quantities of post-consumer plastics packaging waste sent to recycling increased by 138%, energy recovery increased by 469% and landfill decreased by 83%.

2006–2020 EVOLUTION

- Energy recovery: +469%
- Recycling: +138%
- Landfill: -83%

CAGR: Compound Annual Growth Rate
Non-plastics waste (i.e. textiles, adhesives, sealants, coatings, etc.) is not included
*From household, industrial and commercial packaging
Source: Conversio Market & Strategy GmbH
The plastics packaging consumption and waste data used for the above graph were extrapolated based on 2019 available figures. The above data were rounded.
“Energy and logistics crises leading to uncertainties and challenges for the European plastics industry”
In 2022, the war in Ukraine reinforced the already existing problems in the supply chains and the high prices for feedstock and energy. High prices, especially in Europe, weakened economic growth and led to a lower demand for plastics.

Source: Eurostat, September 2022
The sharp decline in the European plastics production caused by the COVID-19 pandemic in the first half of 2020 was followed by an even stronger recovery in 2021. However, significant uncertainties remain for end 2022 and 2023 due to the current energy and logistics crises.

**Growth rate:**

- 2020: -5%
- 2021: 10.5%
- 2022: -4% (prediction with the assumption of no gas shortage in Europe)

Due to geopolitical uncertainties is not possible to present a prediction for 2023

Index 2015 = 100; on a quarterly basis, seasonally and working day adjusted

Source: Eurostat, September 2022
List of acronyms

ABS: Acrylonitrile butadiene styrene resin
ASA: Acrylonitrile styrene acrylate
bn: billion
CAGR: Compound Annual Growth Rate
CIS: Commonwealth of Independent States
EU: European Union
EU27+3: EU Member States, Norway, Switzerland and the United Kingdom
EU27+UK: EU Member States and the United Kingdom
EPRO: European Association of Plastics Recycling and Recovery Organisations
kt: kilo tonnes
Mt: million tonnes
PA: Polyamides. Plastics – the Facts figures on PA only cover PA6 and PA66
PBT: Polybutylene terephthalate
PC: Polycarbonate
PE: Polyethylene
PEEK: Polyetheretherketone
PE-HD: Polyethylene, high density
PEI: Polyetherimide
PE-LD: Polyethylene, low density
PE-LLD: Polyethylene, linear low density
PE-MD: Polyethylene, medium density
PEMRG: Plastics Europe Market Research Group
PET: Polyethylene terephthalate
PMMA: Polymethyl methacrylate
POM: Polyoxymethylene
PP: Polypropylene
PPA: Polyptalamide
PS: Polystyrene
PS-E: Expandable polystyrene
PTFE: Polytetrafluoroethylene
PSU/PES/PPSU: polysulfone/polyethersulfone/polyphenylsulfone
PUR: Polyurethane
PVC: Polyvinyl chloride
PVDF: Polyvinylidene
SAN: Styrene–acrylonitrile copolymer
Plastics Europe

Plastics Europe is the pan-European association of plastics manufacturers with offices across Europe. For over 100 years, science and innovation has been the DNA that cuts across our industry. With close to 100 members producing over 90% of all polymers across Europe, we are the catalyst for the industry with a responsibility to openly engage with stakeholders and deliver solutions which are safe, circular and sustainable. We are committed to implementing long-lasting positive change.

www.plasticseurope.org

EPRO
European Association of Plastics Recycling and Recovery Organisations

EPRO is a pan-European partnership of specialist organisations that are able to develop and deliver efficient solutions for the sustainable management of plastic waste, now and for the future. EPRO members are working to optimise national effectiveness through international co-operation: by studying successful approaches, evaluating different solutions and examining obstacles to progress. By working together EPRO members can achieve synergies that will increase efficient plastics recycling and recovery. Currently 19 organisations in 14 European countries, South Africa and Canada are represented in EPRO.

www.epro-plasticsrecycling.org