Plastics – the Facts 2019

An analysis of European plastics production, demand and waste data


This report gives an insight into the plastics industry's contribution to European economic growth and prosperity throughout the life cycle of the material.

Plastics—the Facts is an analysis of the data related to the production, demand and waste management of plastic materials. It provides the latest business information on production and demand, trade, recovery as well as employment and turnover in the plastics industry. In short, this report gives an insight into the industry's contribution to European economic growth and prosperity throughout the life cycle of the material.

The data presented in this report was collected by PlasticsEurope (the Association of Plastics Manufacturers in Europe) and EPRO (the European Association of Plastics Recycling and Recovery Organisations). PlasticsEurope's Market Research and Statistics Group (PEMRG) provided input on the production and the demand of plastic raw materials. Conversio Market & Strategy GmbH helped assess waste collection and recovery data. Official statistics from European or national authorities and waste management organisations have been used for recovery and trade data, 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. Some estimates from previous years have been revised in order to track progress, e.g. for use and recovery of plastics across Europe over the past decade.

All figures and graphs in this report show data for EU-28 plus Norway and Switzerland, which is referred to as Europe for the purposes of abbreviation –other country groups are explicitly listed.

Plastics 2030: committed to Circularity

The European plastics industry supports the European Commission's strategy for Plastics in a Circular Economy and is highly committed to accelerate its transformation towards an even more circular and resource efficient plastic economy.

Since the very beginning, plastic materials were born as a solution for the substitution of scarce and non-sustainable resource such as tortoiseshell, ivory or animal bones. Since then, plastics have shaped the world bringing safety, hygiene, comfort and wellbeing to our society.

Today resource-efficient plastics are present in an infinite range of products and applications helping us to save energy, CO_2 emissions, water and even food. They contribute to circularity, to health and safety and to mitigate climate change. Without doubt, plastics have shaped our lives and will shape the future.

Plastics contribute to:

Circularity

Health & safety

Mitigate climate change

However, to make the most of these extraordinary materials, challenges related to the end of life of certain products - and particularly plastic packaging – still need to be addressed. PlasticsEurope's "Plastics 2030" Voluntary Commitment has taken the industry to the next level of engagement by establishing ambitious targets and initiatives to prevent the leakage of plastics into the environment; increasing the reuse and recycling of plastic packaging waste and contributing to resource efficiency benefits.

For more information on "Plastics 2030":
https://www.plasticseurope.org/en/focus-areas/strategy-plastics

Plastics do not belong to the oceans

Marine litter is a global challenge and it is unacceptable that waste, including plastic waste, ends up in our environment, our rivers and our oceans. Plastics are valuable resources that bring numerous benefits to society by offering sustainable solutions in countless sectors. Whether caused by irresponsible behaviour or poor waste management practices, it is deplorable that plastics are littered.

For years, the plastics industry has been engaged at a global level in combatting marine litter. PlasticsEurope is a committed signatory to the global Declaration for **Marine Litter Solutions** for preventing leakage of plastics into environment. In the framework of the Global Plastics Alliance (an alliance of 74 plastics associations from around the world) over 355 projects have been run or are ongoing in different parts of the globe to fight this problematic.

MARINE LITTER SOLUTIONS

www.marinelittersolutions.com

PlasticsEurope is also committed to prevent pellet loss and is a signatory of the initiative **Operation Clean Sweep©**, a voluntary programme that promotes proper pellets containment along the entire plastics value chain. This programme is being implemented across the plastics industry value chain in order to avoid plastic pellet spills.

Operation Clean Sweep®

www.opcleansweep.eu

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Contribution to European society

Key figures of the European plastics industry

The European plastics industry includes plastics raw materials producers, plastics converters, plastics recyclers and plastics machinery manufacturers in the EU28 Member States.

JOBS

Over 1.6 million people

The plastics industry gives direct employment to more than 1.6 million people in Europe

COMPANIES

Close to 60,000 companies

An industry in which close to 60,000 companies operate, most of them being SME's

TURNOVER

More than 360 billion euros

The European plastics industry had a turnover of more than 360 billion euros in 2018

TRADE BALANCE

15 billion euros

The European plastics industry had a positive trade balance of more than 15 billion euros in 2018

* Data including only plastics raw materials producers and plastics converters

INDUSTRIAL VALUE ADDED

7th in Europe

The European plastics industry ranks 7th in Europe in industrial value added contribution. At the same level as the pharmaceutical industry* and very close to the chemical industry

* Measured by gross value added at factor prices, 2013

MULTIPLIER EFFECT

x2.4 in GDP and almost x3 in jobs

The European plastics industry has a multiplier effect of 2.4 in GDP and almost 3 in jobs*

* The European House Ambrosetti study, data for Italy, 2013

PUBLIC FINANCES

Close to 30 billion euros

The European plastics industry contributed to 28.8 billion euros to public finances and welfare in 2018

RECYCLING

9.4 million tonnes

In 2018, 9.4 million tonnes of plastic post-consumer waste were collected in Europe to be recycled (inside and outside the EU)


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mph
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Market data

What are "Plastics"?

We talk about "Plastics" as if it were a single material, but that is not the case. In the same way that we know that there are different types of metals with different properties, plastics are also an extensive family of different materials. Each plastic is designed with specific characteristics that make it ideal for the application to which it is intended, providing us with very resource-efficient solutions.

Plastic materials can be produced from different sources. Its raw materials can be of fossil origin (crude oil, gas, etc) or renewable (sugar cane, starch, vegetable oils, etc) or even mineral base (salt). Regardless of the nature of their raw materials, certain plastics are also biodegradable. This means that provided they are properly collected and treated together with organic waste, they can biodegrade and become compost.

Whatever their origin, at the end of their service life, plastic materials are important resources that we can use either in the form of new materials or as an alternative energy source once used in energy recovery facilities.

Thermoplastics

are a family of plastics that can be melted when heated and hardened when cooled. These characteristics, which lend the material its name, are reversible. That is, it can be reheated, reshaped and frozen repeatedly.

- Polyethylene (PE)
- Polypropylene (PP)
- Polyvinyl-chloride (PVC)
- Polyethylene Terephthalate (PET)
- Polystyrene (PS)
- Expanded polystyrene (EPS)
- ABS
- SAN
- Polyamides (PA)
- Polycarbonate (PC)
- Poly methyl methacrylate (PMMA)
- Thermoplastic elastomers (TPE)
- Polyarylsulfone (PSU)
- Fluoropolymers
- PEEK
- POM
- PBT
- EVOH
- Etc.

Thermosets

are a family of plastics that undergo a chemical change when heated, creating a three dimensional network. After they are heated and formed these plastics cannot be re-melted and reformed.

- Polyurethane (PUR)
- Unsaturated polyesters
- Epoxy resins
- Melamine resin
- Vinyl esters
- Silicone
- Phenol - formaldehyde resins
- Urea - formaldehyde resins
- Phenolic resins
- Acrylic resins
- Etc.

Discovering the wide family of plastics

The plastics' family is composed of a wide variety of materials designed to meet the very different performance requirements of thousands of end products.

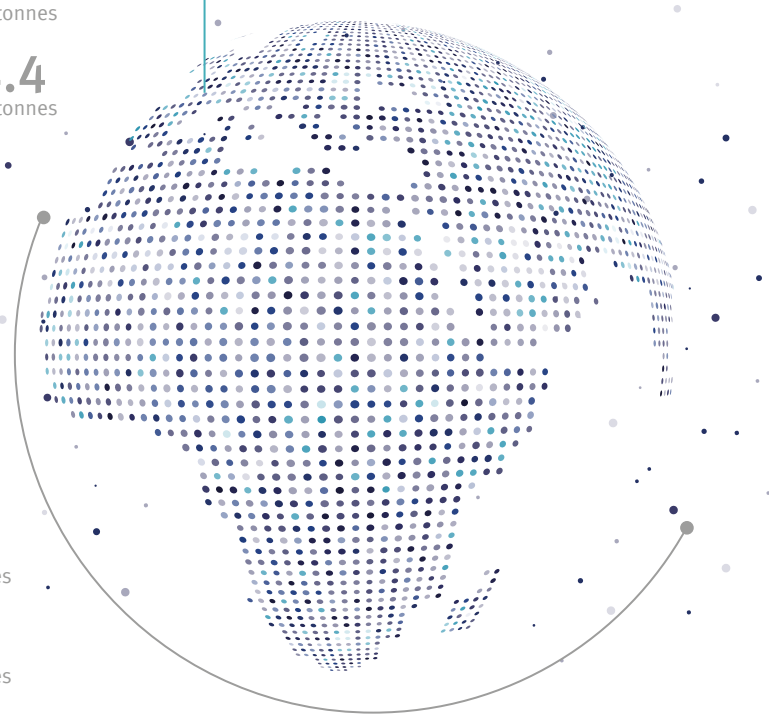
World and EU plastics production data

In 2018, global plastics production almost reached 360 million tonnes. In Europe, plastics production almost reached 62 million tonnes.

Europe (EU28+NO/CH)

2018 **61.8** million tonnes

2017 **64.4** million tonnes



World

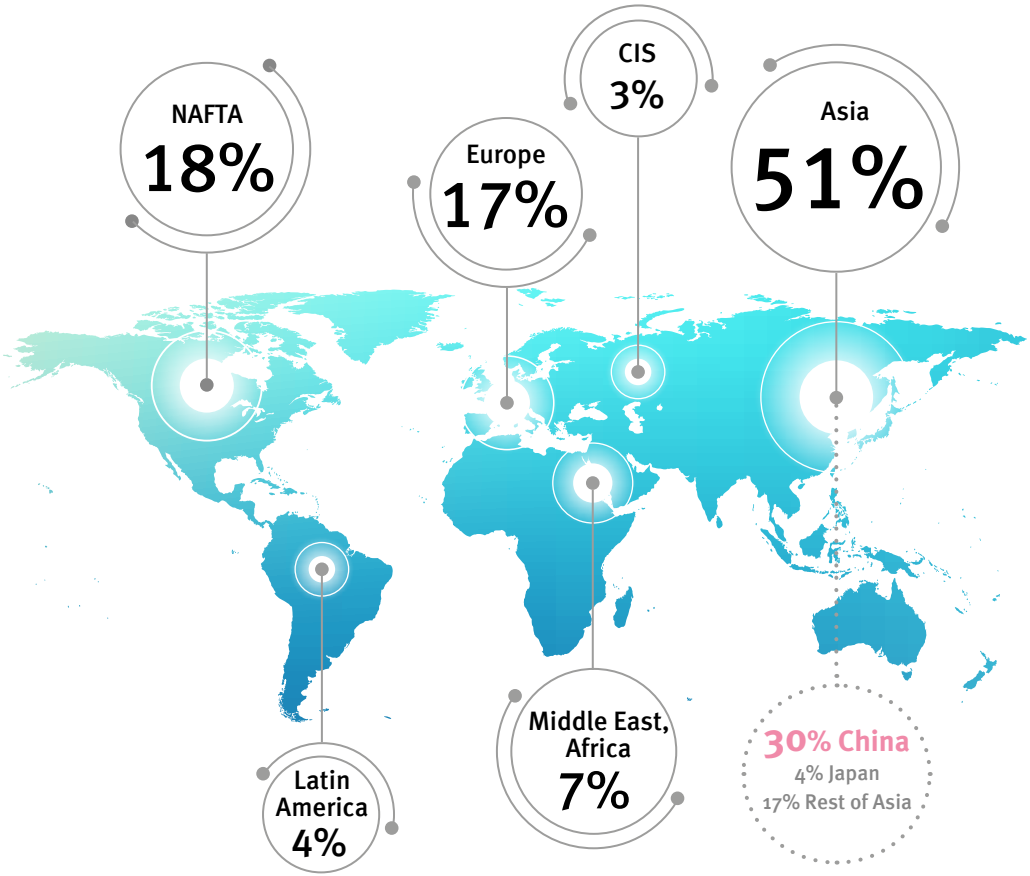
2018 **359** million tonnes

2017 **348** million tonnes

Includes Thermoplastics, Polyurethanes, Thermosets, Elastomers, Adhesives, Coatings and Sealants and PP-Fibers. Not included: PET-fibers, PA-fibers and Polyacryl-fibers.

SOURCE: PlasticsEurope Market Research Group (PEMRG) and Conversio Market & Strategy GmbH

Distribution of global plastics production



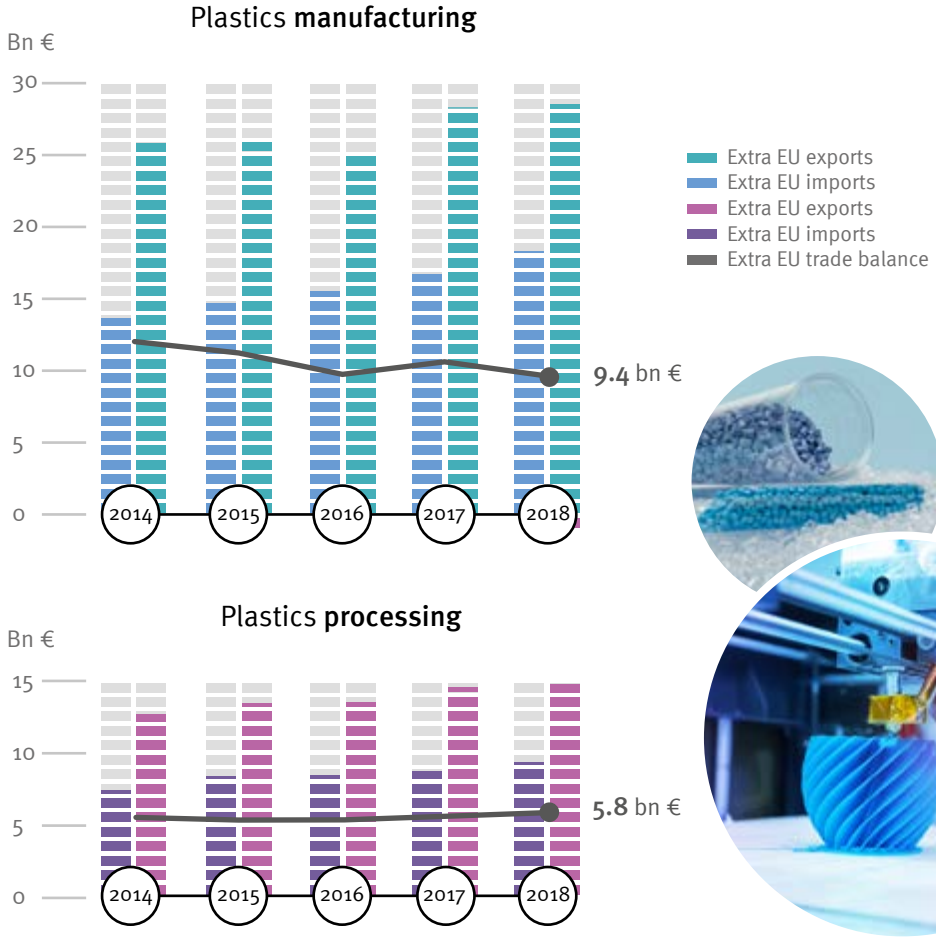
In 2018 China reached 30% of world's plastics production.

World plastics* production: 359 million tonnes.

* Includes Thermoplastics, Polyurethanes, Thermosets, Elastomers, Adhesives, Coatings and Sealants and PP-Fibers. Not included: PET-fibers, PA-fibers and Polyacryl-fibers.

SOURCE: PlasticsEurope Market Research Group (PEMRG) and Conversio Market & Strategy GmbH

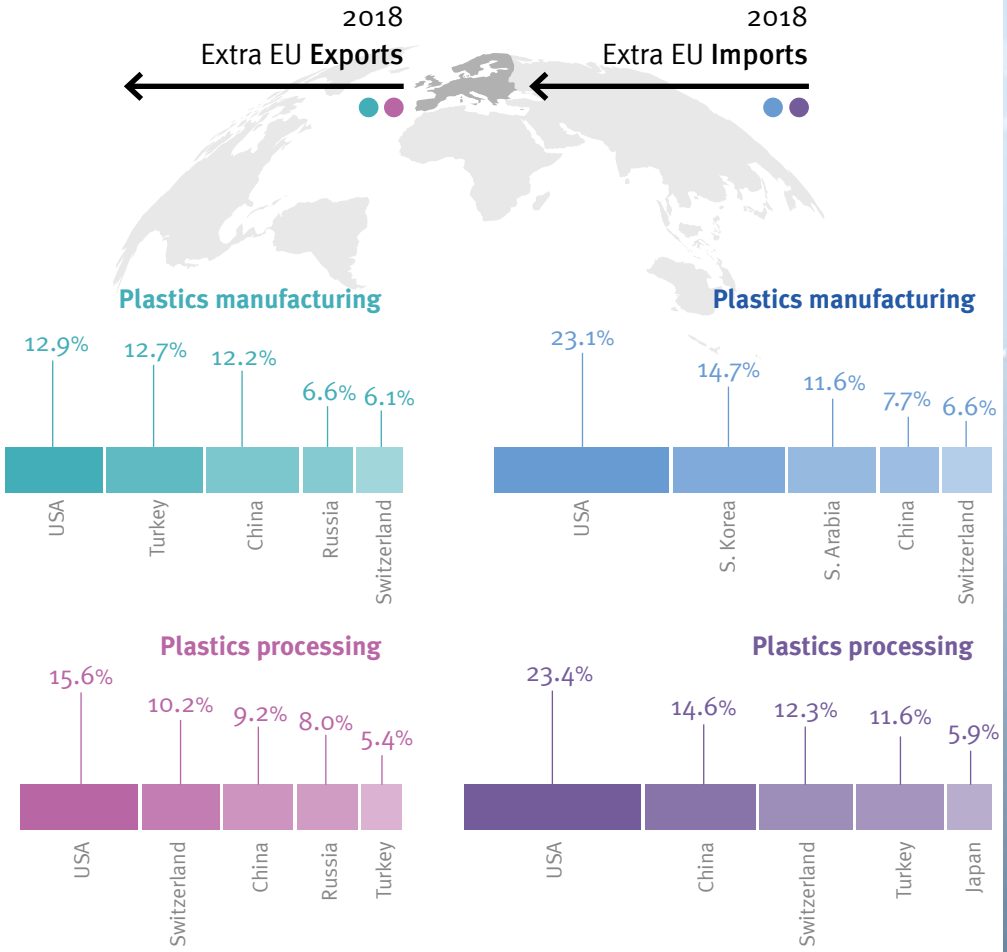
In 2018 the industry reached a positive trade balance of more than 15 billion euros



SOURCE: Eurostat

Top Extra EU trade partners in value

In 2018, the USA was the first trade partner of the European Plastics Industry.



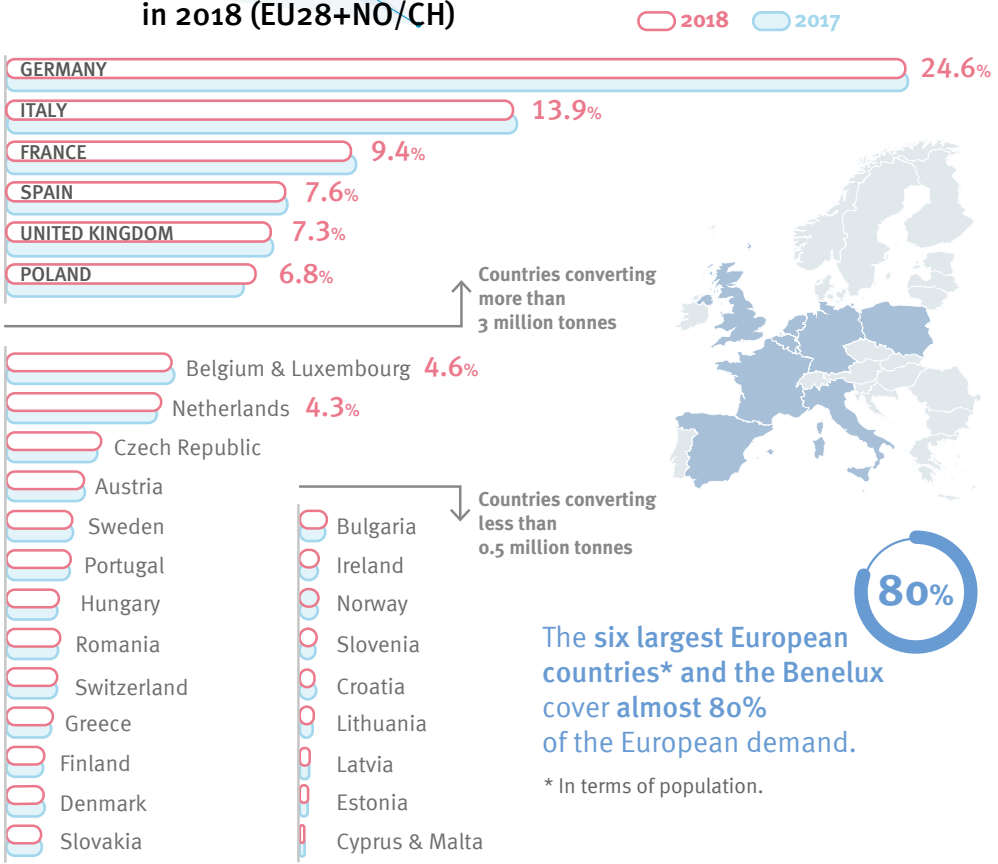
SOURCE: Eurostat


Medical Kit

Plastics demand by countries 2018

51.2 Mt

European converters demand in 2018 (EU28+NO/CH)



The **six largest European countries* and the Benelux** cover **almost 80%** of the European demand.

* In terms of population.

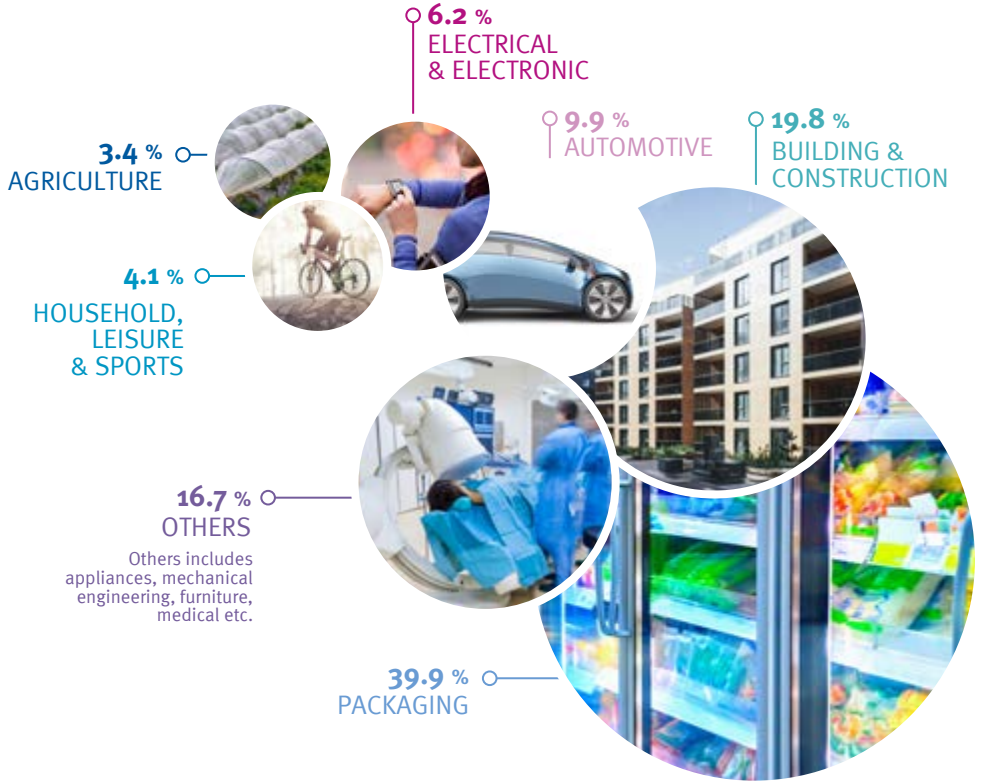
European plastic converters demand includes thermoplastics, polyurethanes and other plastics.

Does not include: adhesives, coatings, paints and varnishes, PET fibers, PA fibers, PP fibers and polyacryl-fibers.

SOURCE: PlasticsEurope Market Research Group (PEMRG) and Conversio Market & Strategy GmbH

Plastics demand by segment 2018

Distribution of European (EU28+NO/CH) plastics converters demand by segment in 2018. **Packaging** and **Building & Construction** by far represent the largest end-use markets.
The third biggest end-use market is the **Automotive** Industry.



51.2 M t
Total European plastics converters demand

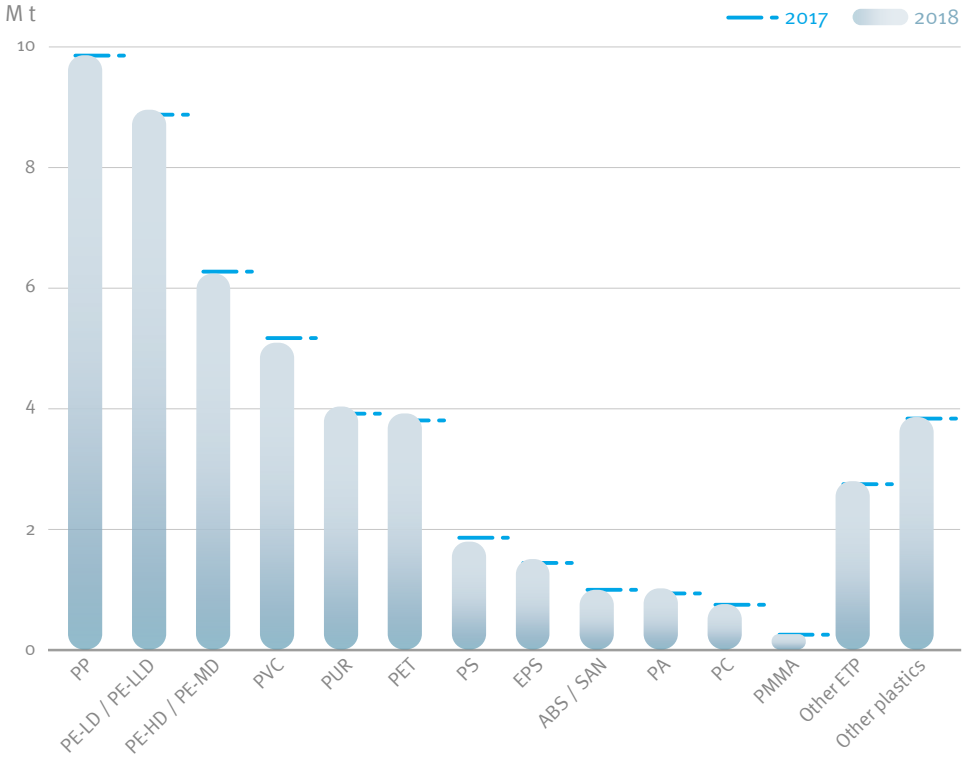
SOURCE: PlasticsEurope Market Research Group (PEMRG) and Conversio Market & Strategy GmbH

51.2 M t
Total European plastics converters demand

Plastics demand by resin types 2018

Distribution of European (EU28+NO/CH) plastics converters demand by resin type in 2018.

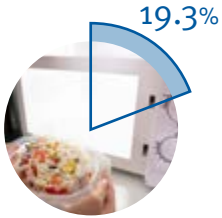
Leading polymers are the polyolefins (PE & PP).



SOURCE: PlasticsEurope Market Research Group (PEMRG) and Conversio Market & Strategy GmbH

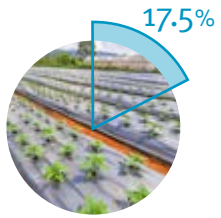
Plastics demand distribution by resin types 2018

Data for EU28+NO/CH.



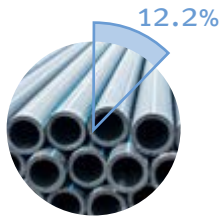
PP

Food packaging, sweet and snack wrappers, hinged caps, microwave containers, pipes, automotive parts, bank notes, etc.



PE-LD / PE-LLD

Reusable bags, trays and containers, agricultural film, food packaging film, etc.

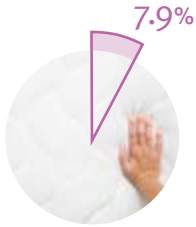


PE-HD / PE-MD

Toys, milk bottles, shampoo bottles, pipes, houseware, etc.

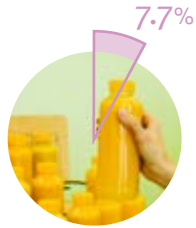
PVC

Window frames, profiles, floor and wall covering, pipes, cable insulation, garden hoses, inflatable pools, etc.



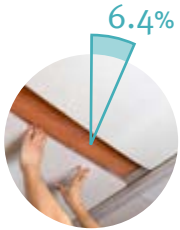
PUR

Building insulation, pillows and mattresses, insulating foams for fridges, etc.



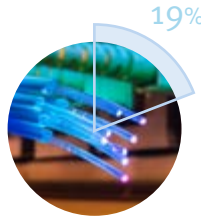
PET

Bottles for water, soft drinks, juices, cleaners, etc.



PS / EPS

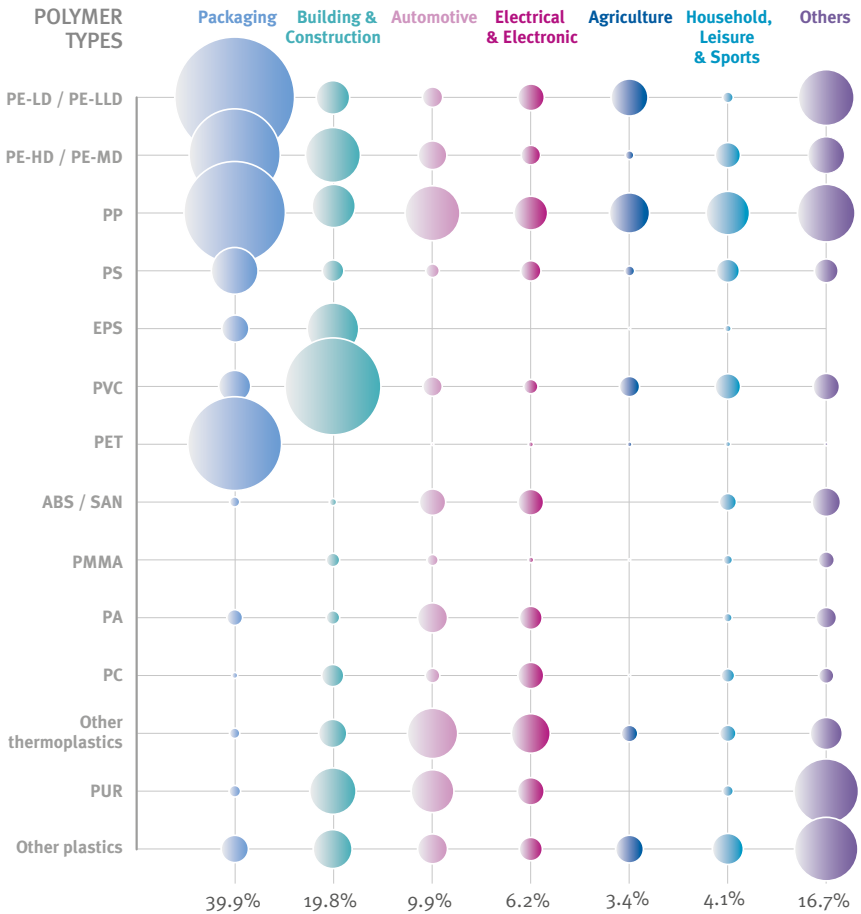
Food packaging (dairy, fishery), building insulation, electrical & electronic equipment, inner liner for fridges, eyeglasses frames, etc.



OTHERS

Hub caps (ABS); optical fibres (PBT); eyeglasses lenses, roofing sheets (PC); touch screens (PMMA); cable coating in telecommunications (PTFE); and many others in aerospace, medical implants, surgical devices, membranes, valves & seals, protective coatings, etc.

SOURCE: PlasticsEurope Market Research Group (PEMRG) and Conversio Market & Strategy GmbH



Plastics demand by segments and polymer types in 2018. Total 51.2 M t

Data for EU28+NO/CH.

SOURCE: PlasticsEurope Market Research Group (PEMRG) and Conversio Market & Strategy GmbH

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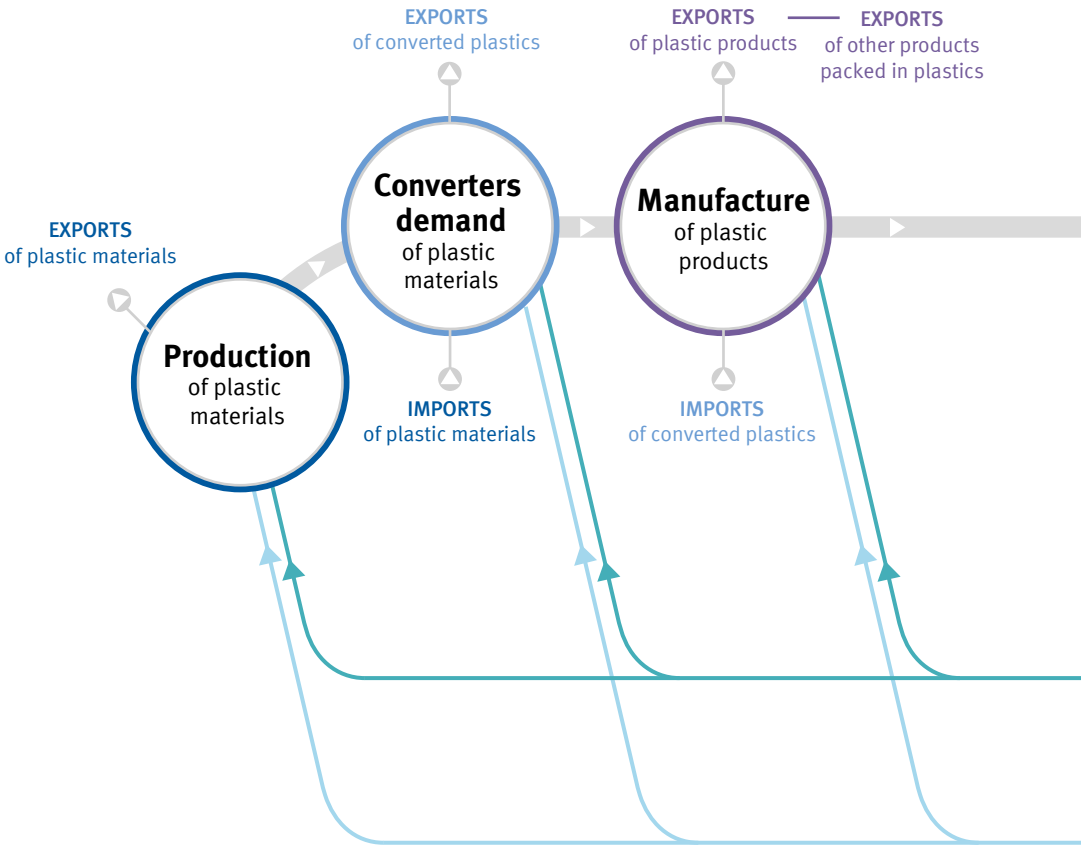
From waste to resource

The life cycle of plastic products

In order to understand the life cycle of plastic products it is important to understand that not all plastic products are the same and not all have the same service life.

Some are a product in itself (i.e. a bottle) and some are parts of an end-user product (i.e. parts of a car or electronic devices, insulation for a building, etc.). At the end of their life, the end-user products become waste which is collected and treated.



Life service of plastic products

The service life of plastic products goes from less than 1 year to 50 years or more

Consumption of plastic products

IMPORTS of converted plastics

IMPORTS of other products packed in plastics

Plastics become waste at the end of their service life

Plastic post-consumer waste generation

COLLECTED waste

NON collected waste*

RECYCLING 32.5%

ENERGY RECOVERY 42.6%

LANDFILL 24.9%

* Littering and unauthorised dumping

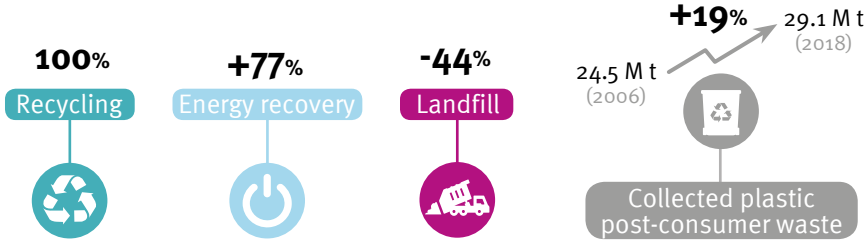
Some plastic products have a lifespan of less than one year, some others of more than 15 years and some have a service life of 50 years or more.

Thus, from production to waste, different plastic products show different uses within individual value chains. Therefore, the amount of collected plastic waste does not necessarily correlate with the plastics demand of the same year.

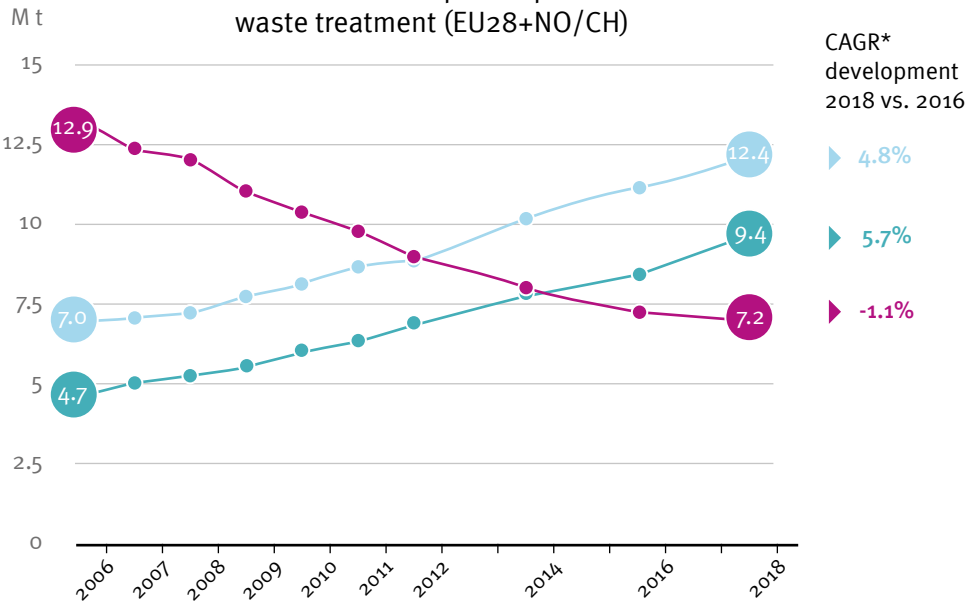
SOURCE: Conversio Market & Strategy GmbH

Since 2006, the amount of plastic waste sent to recycling has doubled

However, 25% of plastic post-consumer waste was still sent to landfill in 2018.

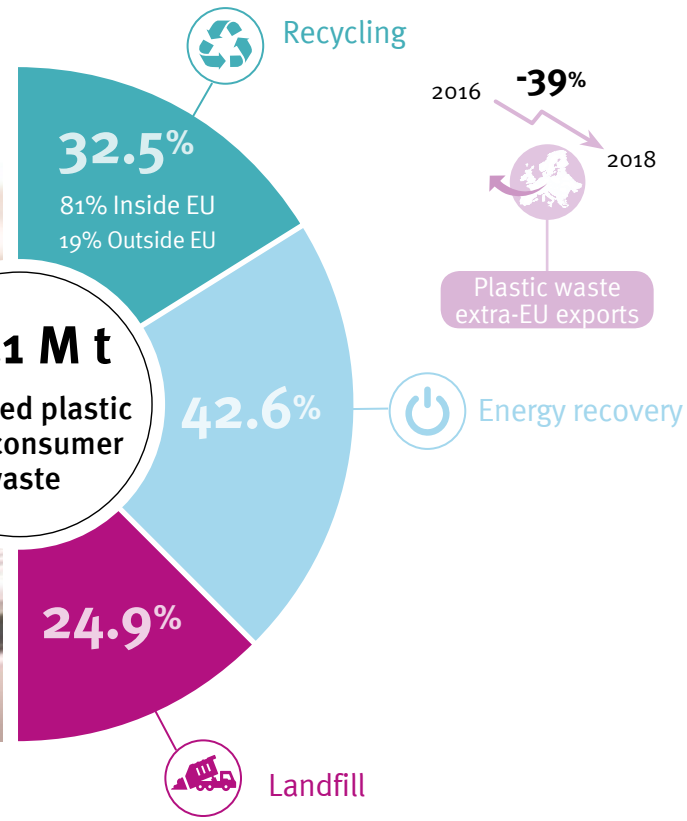


2006-2018 **evolution** of plastic post-consumer waste treatment (EU28+NO/CH)



*CAGR: Compound Annual Growth Rate is the mean annual growth rate over a specific period of time

SOURCE: Conversio Market & Strategy GmbH



Plastic post-consumer waste treatment in 2018

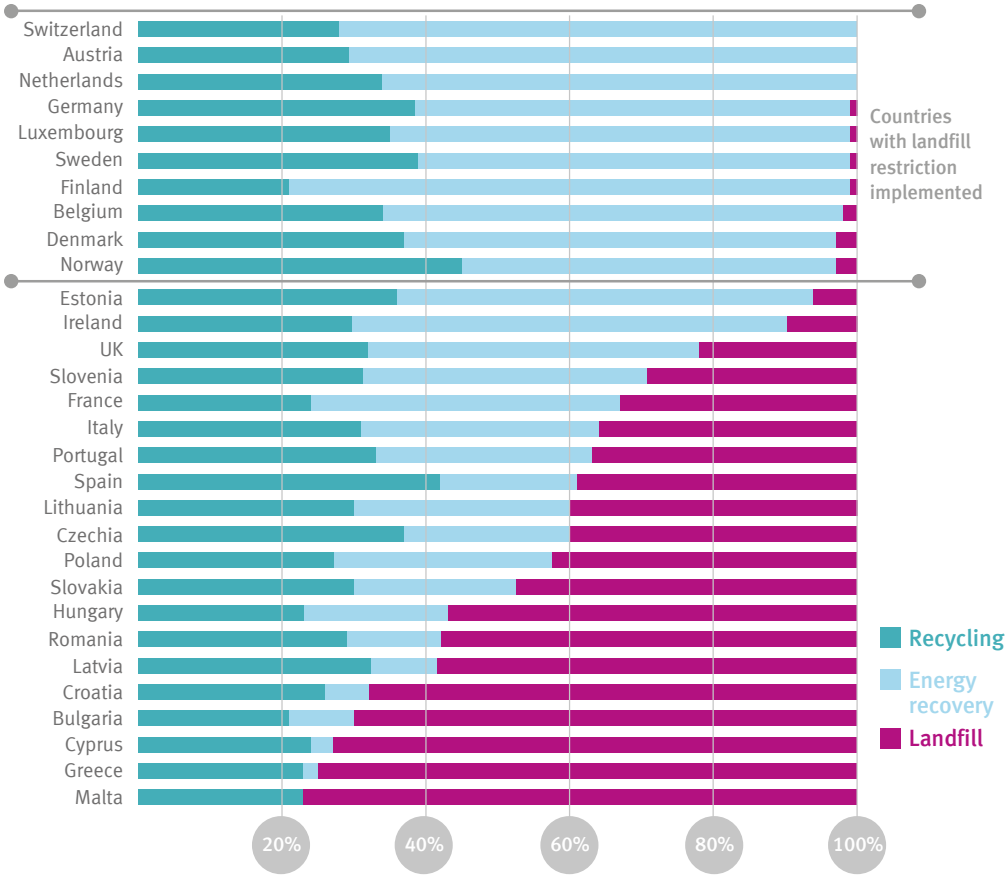
In 2018, 29.1 million tonnes of plastic waste were collected in the EU28+NO/CH in order to be treated.

Plastic waste exports outside the EU have decreased by 39% from 2016 to 2018.

SOURCE: Conversio Market & Strategy GmbH


95
bpm

Plastic **post-consumer waste rates** of recycling, energy recovery and landfill per country in 2018



Zero landfilling is needed to achieve the circular economy of plastics

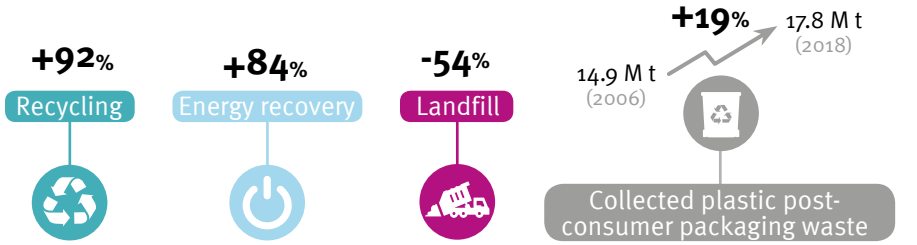
Countries with landfill restrictions of recyclable and recoverable waste have, on average, higher recycling rates of plastic post-consumer waste.

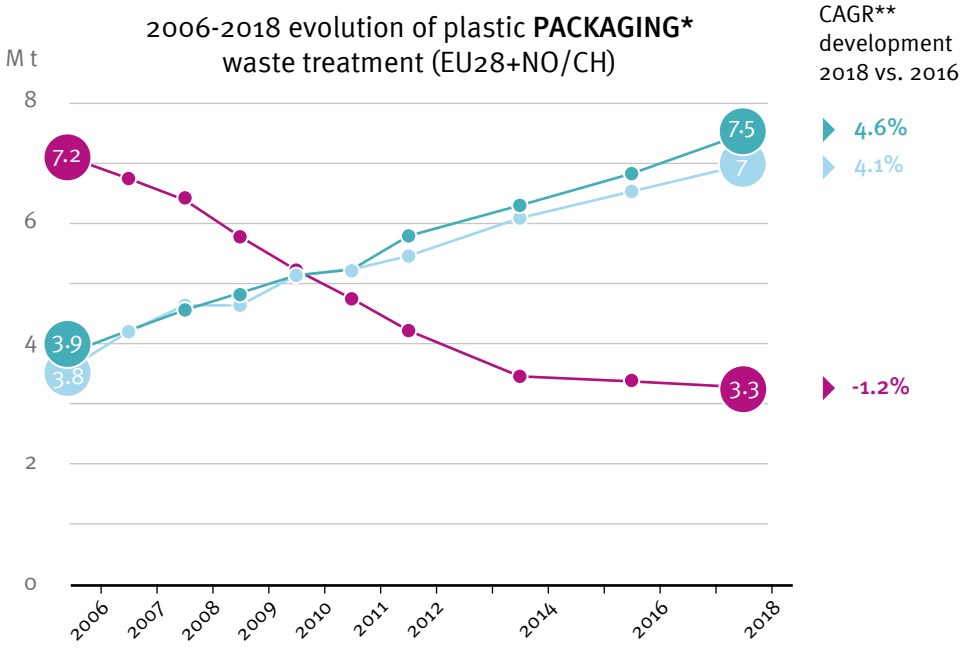
SOURCE: Conversio Market & Strategy GmbH

Since 2006, the quantity of plastic post-consumer packaging waste sent to recycling has increased by 92%

2018 data show a positive trend for recycling, however more than 18% of the waste is still sent to landfill.

SOURCE: Conversio Market & Strategy GmbH

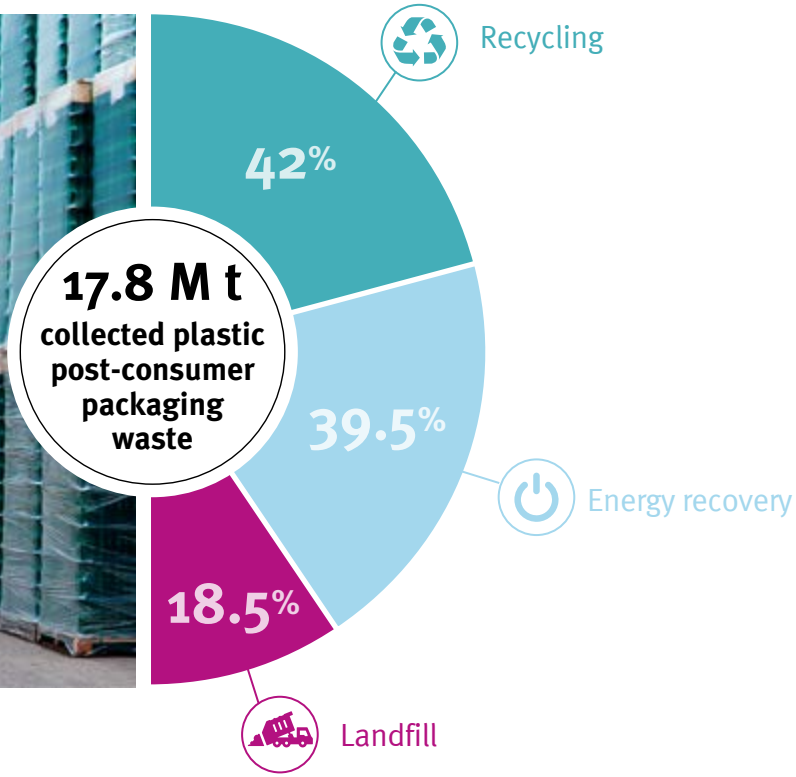




*From household, industrial and commercial packaging

**CAGR: Compound Annual Growth Rate is the mean annual growth rate over a specific period of time

Plastic **PACKAGING*** waste treatment in 2018 (EU28+NO/CH)



*From household, industrial and commercial packaging

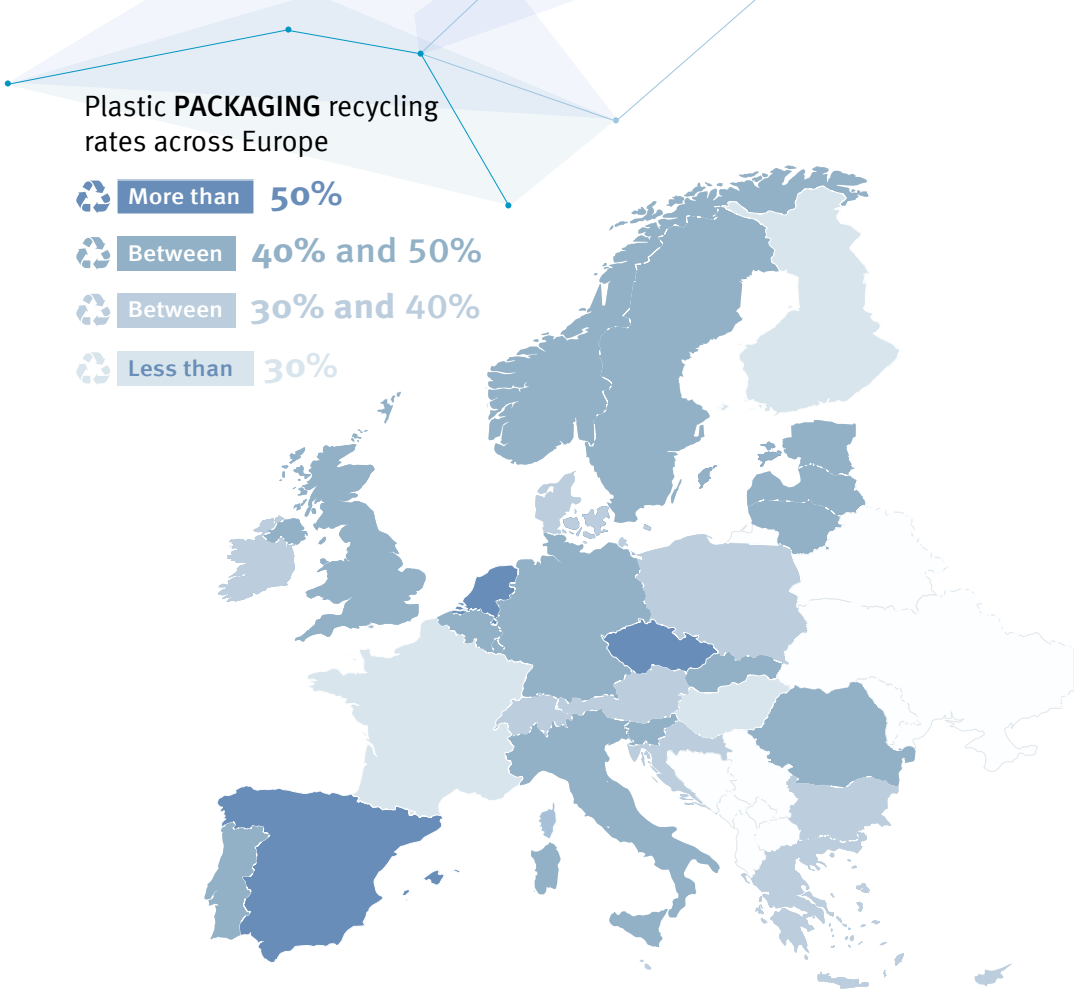
Recycling is the first option for plastic packaging waste

In 2018, 17.8 million tonnes of plastic post-consumer packaging waste were collected in order to be treated.

SOURCE: Conversio Market & Strategy GmbH

More than half of the countries have plastic packaging recycling rates above 40%

In 2018, 17 countries had recycling rates higher than 40% and 3 countries higher than 50%.

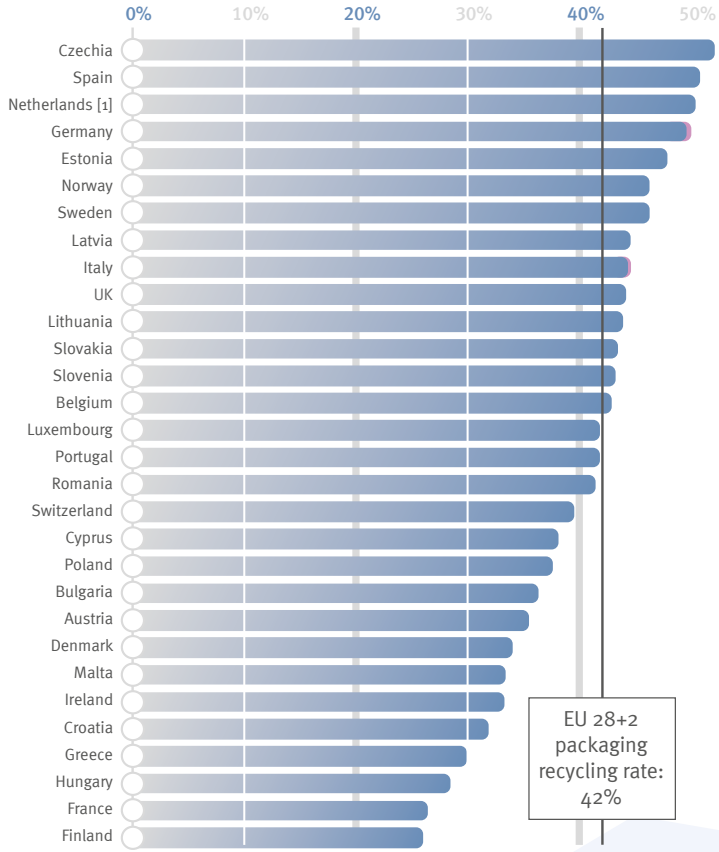


SOURCE: Conversio Market & Strategy GmbH

Plastic packaging recycling

The new Directive (EU) 2018/852 on Packaging and Packaging Waste sets higher recycling targets per material (50% for plastic packaging by 2025 and 55% by 2030), together with a new calculation method of recycling performances. This new method will start to be applicable for data of the year 2020.

Plastic **PACKAGING*** recycling rate** per country in 2018



[1] 2017 figure

Recycling rates of plastic packaging waste in Europe range between 26% and 52%. This wide range can be explained by differences in collection schemes, available infrastructure and consumer behaviour. On average, the 42% recycling of plastic packaging represents an increase of 1.2 points versus 2016, in particular thanks to improved waste collection.

* From household, industrial and commercial packaging

** According to the current calculation methods established in Directive 94/62/EC

SOURCE: Conversio Market & Strategy GmbH

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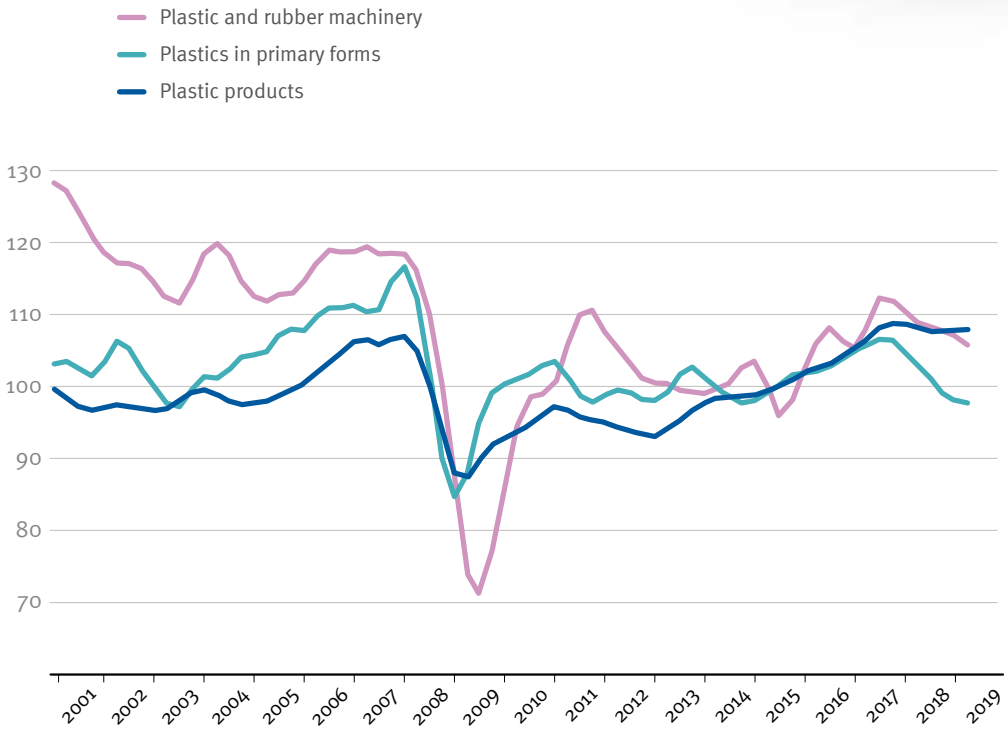
Snapshot and outlooks

In 2019, the negative trend for plastics in primary forms and rubber machinery continued but plastics products slightly recovered

Plastics industry production in EU28 index (2015=100, trend cycle & seasonally adjusted data).

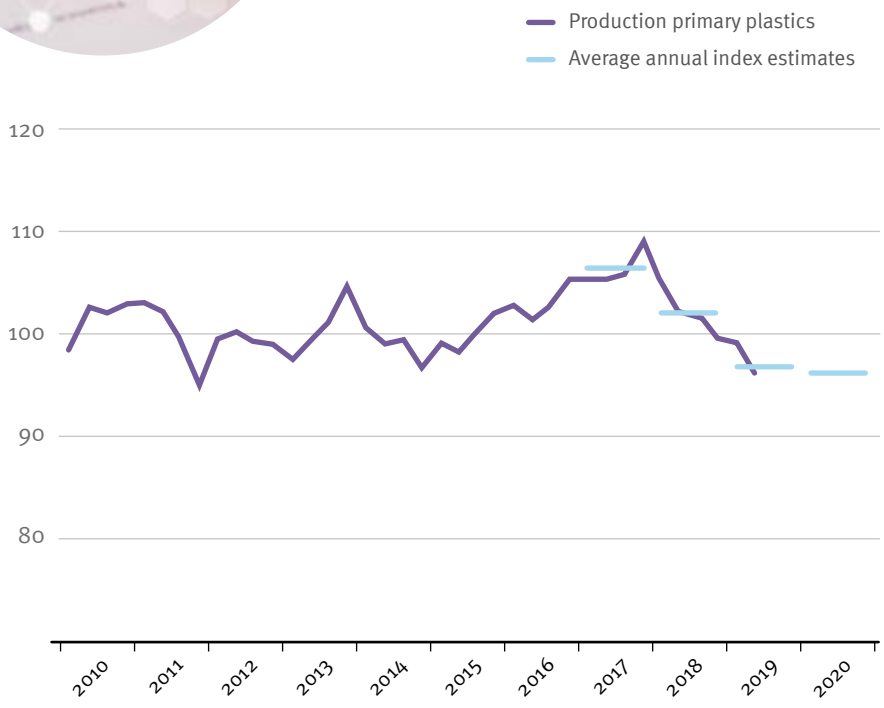
SOURCE: Eurostat



Estimated growth rate:

2019: **-5.0%**

2020: **-0.5%**



The declining growth from the previous year continues in 2019

Production of primary plastics, EU28. Index 2015=100 on a quarterly basis; seasonally and working day adjusted; annual average.

SOURCE: Eurostat

Glossary of terms

ABS	Acrylonitrile butadiene styrene resin
ASA	Acrylonitrile styrene acrylate resin
bn	Billion
CH	Switzerland
CIS	Commonwealth of Independent States
Conversio	Conversio Market & Strategy GmbH
EU	European Union
EPRO	European Association of Plastics Recycling and Recovery Organisations
EPS	Polystyrene, expandable
ETP	Engineering Thermoplastics
GDP	Gross domestic product
kt	Kilotonnes
M t	Million tonnes
NAFTA	North American Free Trade Agreement
NO	Norway
Other plastics	Thermosets, adhesives, coatings and sealants
PA	Polyamides
PBT	Polybutylene terephthalate
PC	Polycarbonate
PE	Polyethylene
PEEK	Polyetheretherketone
PE-HD	Polyethylene, high density
PE-LD	Polyethylene, low density
PE-LLD	Polyethylene, linear low density
PE-MD	Polyethylene, medium density
PEMRG	PlasticsEurope Market Research Group
PET	Polyethylene terephthalate
Plastic materials	Thermoplastics + Polyurethanes
PMMA	Polymethyl methacrylate
POM	Polyoxymethylene
PP	Polypropylene
PS	Polystyrene
PTFE	Polytetrafluoroethylene
PUR	Polyurethane
PVC	Polyvinyl chloride
SAN	Styrene-acrylonitrile copolymer
Thermoplastics	Standard plastics (PE, PP, PVC, PS, EPS, PET [bottle grade]) + Engineering plastics (ABS, SAN, PA, PC, PBT, POM, PMMA, Blends, and others including High Performance Polymers)
Thermosets	Urea-formaldehyde foam, melamine resin, polyester resins, epoxy resins, etc.

PlasticsEurope
Association of Plastics Manufacturers

PlasticsEurope is one of the leading European trade associations with centres in Brussels, Frankfurt, London, Madrid, Milan and Paris. We are networking with European and national plastics associations and have more than 100 member companies, producing over 90% of all polymers across the EU28 member states plus Norway, Switzerland and Turkey. The European plastics industry makes a significant contribution to the welfare in Europe by enabling innovation, creating quality of life to citizens and facilitating resource efficiency and climate protection. Over 1.6 million people are working in more than 60,000 companies (mainly small and medium sized companies in the converting sector) to create a turnover of more than 360 bn EUR per year.

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epro
European Association Of Plastics Recycling & 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 25 organisations from 18 European countries plus Canada, South Africa and New Zealand are represented in EPRO.

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