

Plastics – the Facts 2018

An analysis of European plastics production, demand and waste data





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.

Circularity at the heart of Europe's economic transformation

The European Commission aims at transforming Europe into a more circular and resource efficient economy.

PlasticsEurope fully supports this objective and believes plastic materials can help to achieve it.

It is widely recognised that plastics have a crucial role to play in delivering a more sustainable future. Through their unique combination of light-weight, durability and other intrinsic properties, plastic materials already contribute to reduce GHG emissions making a more efficient use of our resources across a range of different sectors and everyday applications. As a result of their versatility and capacity for innovation, our materials are also invariably best placed to support breakthrough sustainable technologies in areas such as sustainable mobility, smart and efficient building, sustainable agriculture, food conservation or in the healthcare and medical sector, to name only a few.

However, challenges relating to littering and end-of-life options for certain types of plastics waste—especially packaging waste— must be addressed if the material is to achieve its fullest potential in a circular and resource efficient economy.

It is in this spirit of commitment to future generations, that PlasticsEurope has decided to set a series of ambitious targets and initiatives up to 2030 that are focussed on the key areas of preventing leakage of plastics into the environment, improving resource efficiency and increasing recycling and reuse rates.

With its Voluntary Commitment
"Plastics 2030", Plastics Europe is
advancing the plastics industry's role
to a next level of engagement, recognising
that this transformation will only take
place through solutions put into reality
and through the regulatory support
of the EU institutions.



"Plastics 2030": making Circularity and Resource Efficiency a Reality

The Plastics 2030 Voluntary Commitment focuses on preventing leakage of plastics into the environment, on improving resource efficiency and the circularity of plastic packaging applications.

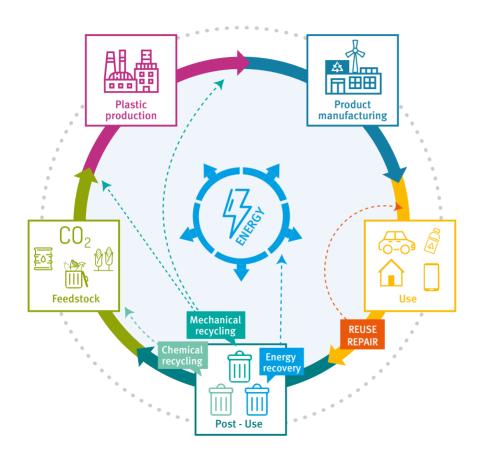
Overarching goals

- Prevent leakage of plastics into the environment.
- 2 Improve resource efficiency.
- 3 Improve **circularity** of plastic packaging.

Targets

- **>** By increasing engagement inside and outside our industry.
- > By accelerating innovation in the full life cycle of products.
- By reaching in 2040 100% reuse, recycling and/or recovery of all plastic packaging in the whole EU. In 2030: 60% reuse and recycling of all plastic packaging.





efficient use of resources, especially during the use phase

At the end of their life,
PLASTICS
are still very
valuable
resources
that can be
transformed into
new
feedstock
or into energy

"Plastics 2030": making Circularity and Resource Efficiency a Reality

General commitments

Prevent the leakage of plastics into the environment

- Prevent littering: identification and littering prevention solution of most found items into the environment.
- Prevent pellet loss:



www.opcleansweep.eu

Improve resource efficiency and circularity of plastics

- Accelerate research of alternative feedstocks.
- Product Life Cycle Inventory: update of datasets every three years.
- Extension of waste data collection, including new data on circularity of plastics.
- Eco-design guidelines for plastic packaging finalised by 2020.
- Support standardisation for quality standards for sorted plastics.

Global Plastics Alliance
Marine Litter Solutions:
355 projects in 47 countries.

Global Initiatives

World Plastics Council
Support of global initiatives
and cooperation with UNEP, G7/G20.



www.marinelittersolutions.com



www.worldplasticscouncil.org

Sector-specific commitments



- Development of packaging design guidelines and assessment protocols according to the principles of the Circular Economy.
- Innovation and standardisation to increase the recyclability of polyolefin packaging.
- EU wide quality standards for pre-sorted plastic waste, harmonisation of test methods for recycled plastic materials and certification of plastic recycling operations.
- Innovation & development of end-use markets to stimulate reuse and encourage demand for recycled plastics.
- Stimulating innovation to improve recycling, conversion technologies and reuse.



- Develop technologies to recycle PS/EPS back into original applications.
- Collaborate with value chain to improve collection and sorting systems for packaging waste.
- Create an independent structure to finance promising technologies. www.styrenics-circular-solutions.com



- Within the framework of VinylPlus (www.vinylplus.eu) further advance and increase safe and quality PVC recycling for all PVC applications.
- Continue developing eco-efficient PVC packaging materials, increasing shelf life of the packed products.

Reporting

Monitoring the progress of the voluntary commitment.

Action plan and time-based performance indicators.

Yearly evaluation provided by independent committee.





Key figures of the European plastic industry

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

Over 1.5 million people

The plastic industry gives direct employment to more than 1.5 million people in Europe





Close to 60,000 companies

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

More than 350 billion euros

The European plastic industry had a turnover of 355 billion euros in 2017





17 billion euros

The European plastic industry had a trade balance of more than 17 billion euros in 2017*

* Data including only plastics raw materials producers and plastics converters

More than 30 billion euros

The European plastic industry contributed to 32.5 billion euros to public finances and welfare in 2017





x2.4 in GDP and almost x3 in jobs

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

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

7th in Europe

The European plastic 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



INDUSTRIAL VALUE ADDED



Over 8.4 million tonnes

In 2016, over 8.4 million tonnes of plastic waste were collected in order to be recycled inside and outside the EU





Plastic or Plastics?



Plastic is a term derived from the Latin "plasticus" which is derived from the Greek "plastikos" that was used to describe something able to be molded or fit for molding. This terminology was actually used already in the 17th century, long before the first plastic material, Parkesine, was invented.

Today "plastics" or "plastic materials" are the terms used to describe an extremely large family of very different materials with different characteristics, properties and uses.

Thanks to their versatility and innovation capacity, plastic materials can offer customized solutions to a wide variety of needs in innumerable products, applications and sectors.

Plastics are not just one material, but a wide family of different materials. Today they can be fossil-based or bio-based and in both cases they can also be bio-degradable.

Discovering the wide family of plastics

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

The two categories of plastics

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) Polycarbonate (PC)

Polypropylene (PP) Poly methyl methacrylate (PMMA)

Polyvinyl-chloride (PVC) Thermoplastic elastomers (TPE)

Polyethylene Terephthalate (PET) Polyarylsulfone (PSU)

Polystyrene (PS) Fluoropolymers

Expanded polystyrene (EPS) PEEK

ABS POM

SAN PBT

Polyamides (PA) 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 polyester

Epoxy resins

Melamine resin

Vinyl ester

Silicone

Phenol - formaldeyhde

Urea - formaldeyhde

Phenolic resins

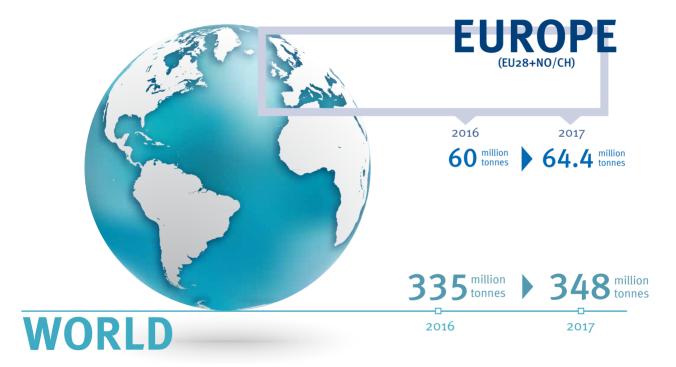
Acrylic resins

Etc.

World and EU plastics production data

The world plastic* production almost reached 350 million tonnes in 2017.

Source: PlasticsEurope Market Research Group (PEMRG) / Conversio Market & Strategy GmbH



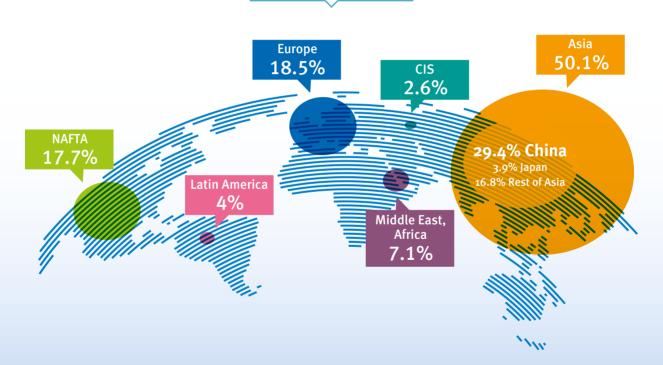
Includes thermoplastics, polyurethanes, thermosets, elastomers, adhesives, coatings and sealants and PP-fibers. Not included PET-, PA- and polyacryl-fibers.

Distribution of global plastics production

China is the largest producer of plastics, followed by Europe and NAFTA.

World plastics* production: 348 million tonnes.

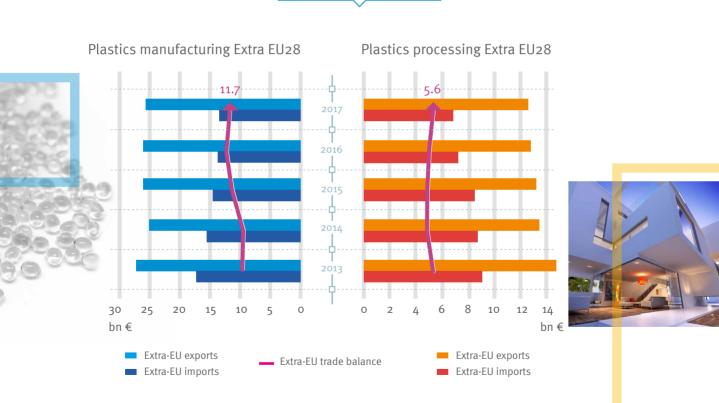
Source: PlasticsEurope Market Research Group (PEMRG) / Conversio Market & Strategy GmbH



^{*}Includes thermoplastics, polyurethanes, thermosets, elastomers, adhesives, coatings and sealants and PP-fibers. Not included PET-, PA- and polyacryl-fibers.

A positive trade balance of more than 17 billion euros in 2017

Source: Eurostat



Top Extra EU trade partners in value

The European plastic industry has good and long-standing trading relationship with many countries.

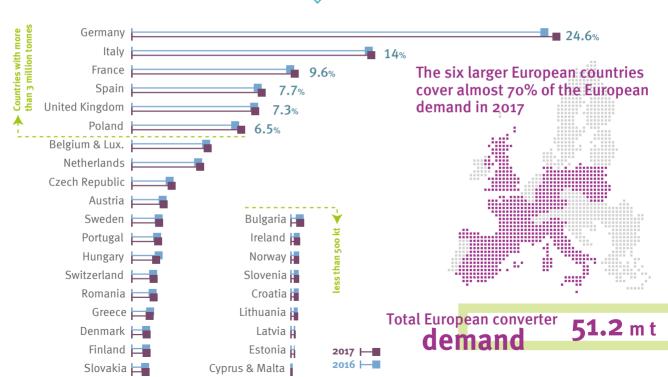




European plastic converter demand per country

European plastic converter demand includes plastic materials (thermoplastics and polyurethanes) and other plastics (thermosets, adhesives, coatings and sealants). Does not include: PET fibers, PA fibers, PP fibers and polyacryls-fibers.

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

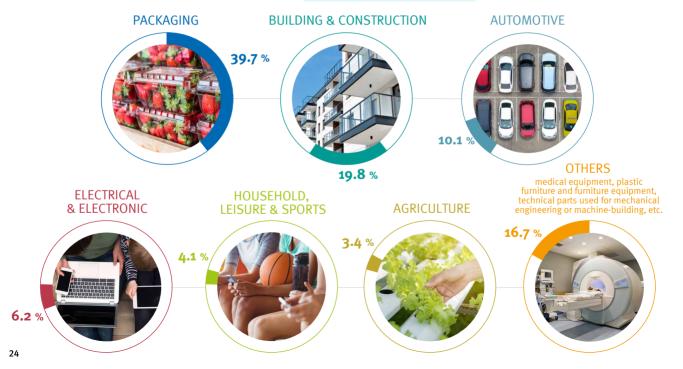


Plastic converter demand main market sectors

Distribution of European (EU28+NO/CH) plastic converter demand by segment in 2017.

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

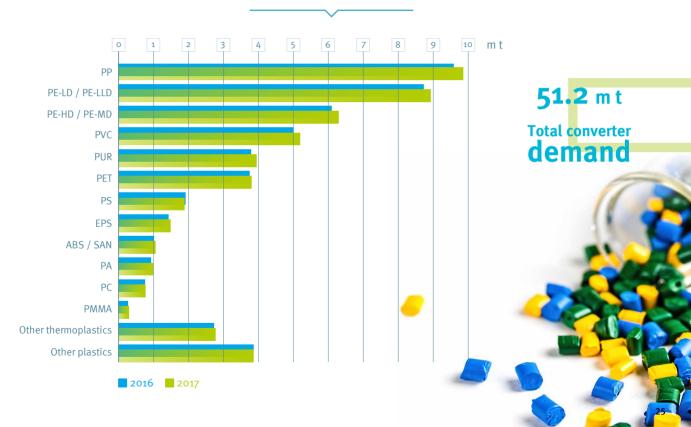
Total converter demand 51.2 m t



Plastic converter demand by resin type

Distribution of European (EU28+NO/CH) plastic converter demand by resin type in 2017.

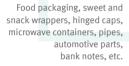
Source: PlasticsEurope Market Research Group (PEMRG) and Conversio Market & Strategy GmbH



European plastic converter demand by polymer types in 2017

Data for EU28+NO/CH.

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



19.3%

PP



OTHERS

19%

Reusable bags, trays and containers, agricultural film (PE-LD), food packaging film (PE-LLD), etc.

PE-LD **PE-LLD** 17.5%



PE-HD PE-MD 12.3%

Toys, (PE-HD, PE-MD), milk bottles, shampoo bottles, pipes, houseware (PE-HD), etc.

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

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

PVC 10.2%



PUR 7.7%

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

& seals, protective coatings, etc.

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



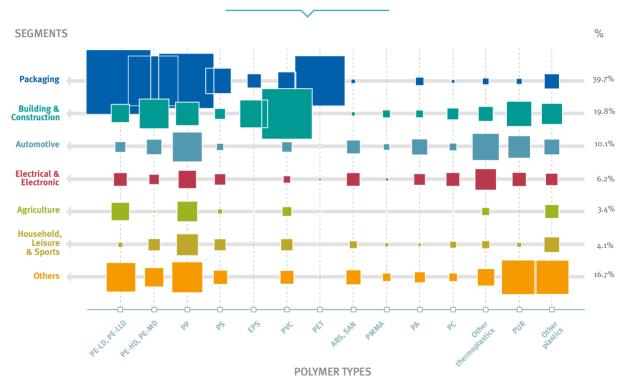
PS, EPS 6.6%

Eveglasses frames, plastic cups, egg trays (PS); packaging, building insulation (EPS), etc.

European plastic converter demand by segments and polymer types in 2017

Data for EU28+NO/CH.

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

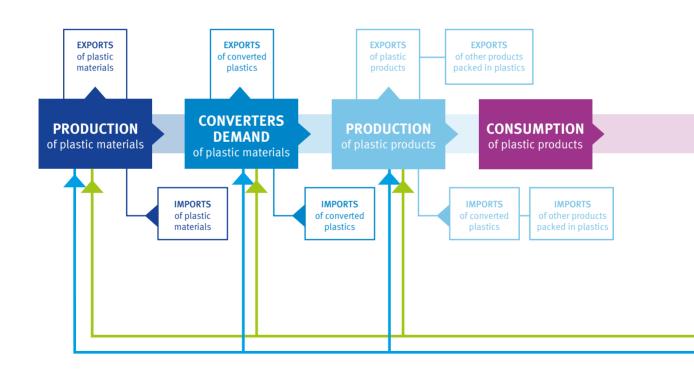






Understanding the life cycle of plastic products

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.



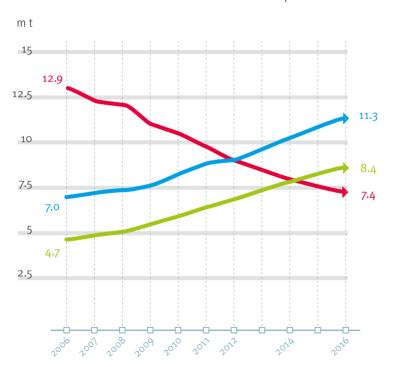
Some plastic products have a shelf life of less than one year, some others, have a lifespan of more than 15 years and some have a service life of 50 years or even more. Thus, from production to waste, different plastic products have different life cycles and this is why the volume of collected waste cannot match, in a single year, the volume of production or consumption.

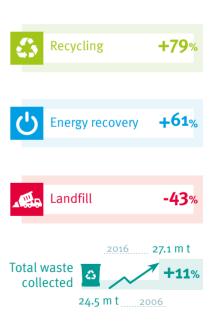


In ten years, plastic waste recycling has increased by almost 80%

From 2006 to 2016 the volumes of plastic waste collected for recycling increased by 79%, energy recovery increased by 61% and landfill decreased by 43%.

2006-2016 evolution of plastic waste treatment (EU28+NO/CH)

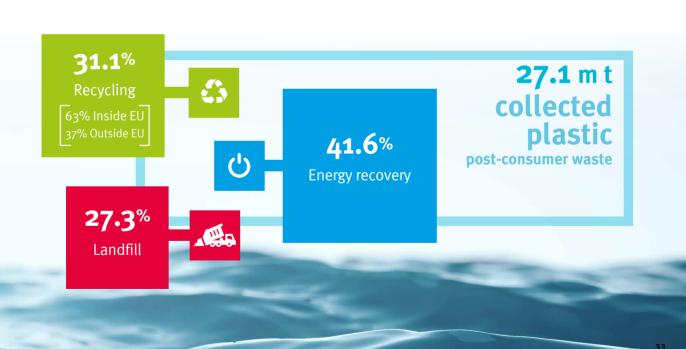




In 2016, for the first time, recycling overtook landfill

In 2016, 27.1 million tonnes of plastic waste were collected through official schemes in the EU28+NO/CH in order to be treated. And for the first time, more plastic waste was recycled than landfilled.

Plastic post-consumer waste treatment in 2016 (EU28+NO/CH)



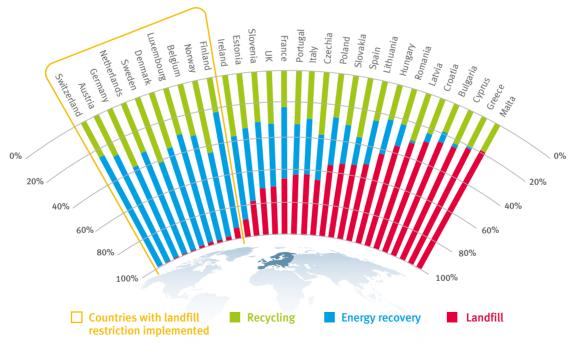


Landfill bans foster higher recycling rates

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

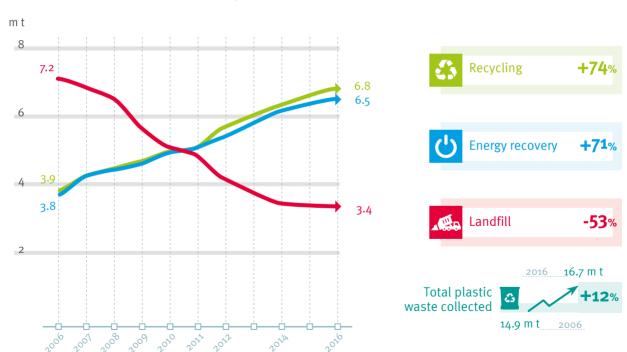
Plastic post-consumer waste rates of recycling, energy recovery and landfill per country in 2016



In ten years, plastic packaging recycling has increased by almost 75%

Source: Conversio Market & Strategy GmbH

2006-2016 evolution of plastic PACKAGING* waste treatment (EU28+NO/CH)

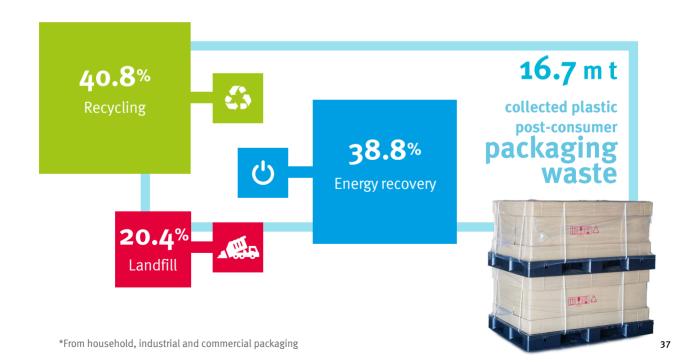


Recycling is the first option for plastic packaging waste

In 2016, 16.7 million tonnes of plastic packaging waste were collected through official schemes in order to be treated.

Source: Conversio Market & Strategy GmbH

Plastic PACKAGING* waste treatment in 2016 (EU28+NO/CH)



Most countries have plastic packaging recycling rates above 35%

In 2016, 19 countries had plastic packaging recycling rates higher than 35%. Two countries achieved a recycling rate of 50% or more (Germany and Czechia).

Plastic **PACKAGING** recycling rates across Europe

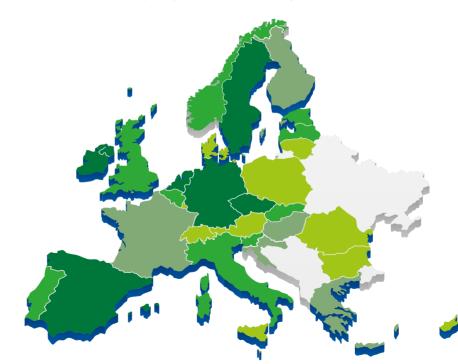


More than 45%

From 40 to 45%

From 30 to 40%

Less than 30%



EU plastic packaging recycling rate is close to 41%

In 2016, the total EU recycling rate for plastic packaging waste was 40.8%, well above the requested 22.5% of the EU Packaging Waste Directive.

Plastic PACKAGING recycling rate per country in 2016

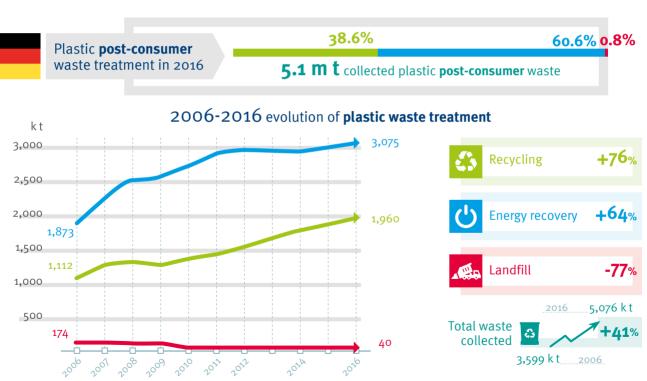






Plastic waste treatment in Germany

In 2016, 5.1 million tonnes of plastic post-consumer waste were collected through official schemes in order to be treated. From 2006 to 2016, the volumes for recycling increased by 76%, energy recovery increased by 64% and landfill decreased by 77%.



Plastic PACKAGING waste treatment in Germany

In 2016, 3 million tonnes of plastic post-consumer packaging* waste were collected through official schemes in order to be treated. From 2006 to 2016, the volume of plastic PACKAGING waste collected for recycling increased by 68%, and landfill decreased by 95%.

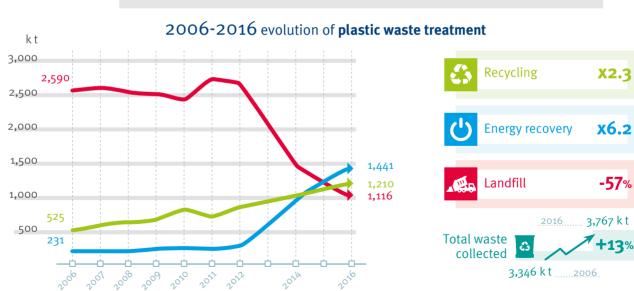




Plastic waste treatment in UK

In 2016, 3.8 million tonnes of plastic post-consumer waste were collected through official schemes in order to be treated. From 2006 to 2016, the volumes for recycling increased by x2.3, energy recovery increased by x6.2 and landfill decreased by 57%.





Plastic PACKAGING waste treatment in UK

In 2016, 2.3 million tonnes of plastic post-consumer packaging* waste were collected through official schemes in order to be treated. From 2006 to 2016 the volume of plastic PACKAGING waste collected for recycling increased by x2.1 and landfill decreased by 66%.



Plastic waste treatment in Italy

In 2016, 3.4 million tonnes of plastic post-consumer waste were collected through official schemes in order to be treated. From 2006 to 2016, the volumes for recycling increased by 46%, energy recovery increased by 53% and landfill decreased by 49%.







Plastic PACKAGING waste treatment in Italy

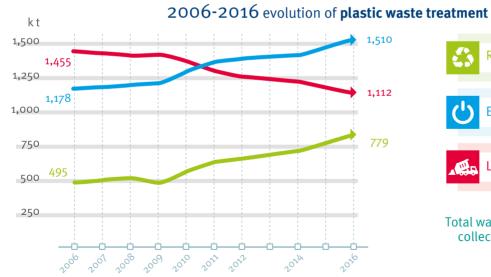
In 2016, 2.2 million tonnes of plastic post-consumer packaging* waste were collected through official schemes in order to be treated. From 2006 to 2016, the volume of plastic PACKAGING waste collected for recycling increased by 41%, and landfill decreased by 66%.



Plastic waste treatment in France

In 2016, 3.4 million tonnes of plastic post-consumer waste were collected through official schemes in order to be treated. From 2006 to 2016, the volumes for recycling increased by 57%, energy recovery increased by 28% and landfill decreased by 24%.

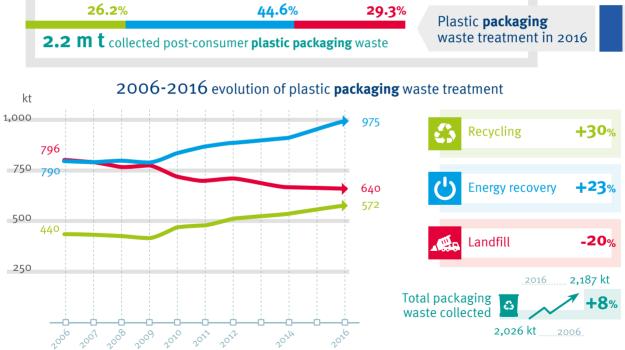






Plastic PACKAGING waste treatment in France

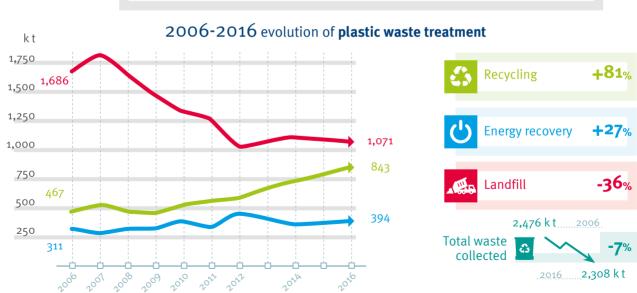
In 2016, 2.2 million tonnes of plastic post-consumer packaging* waste were collected through official schemes in order to be treated. From 2006 to 2016, the volume of plastic PACKAGING waste collected for recycling increased by 30% and landfill decreased by 20%.



Plastic waste treatment in Spain

In 2016, 2.3 million tonnes of plastic post-consumer waste were collected through official schemes in order to be treated. From 2006 to 2016, the volumes for recycling increased by 81%, energy recovery increased by 27% and landfill decreased by 36%.





Plastic PACKAGING waste treatment in Spain

In 2016, 1.5 million tonnes of plastic post-consumer packaging* waste were collected through official schemes in order to be treated. From 2006 to 2016, the volume of plastic PACKAGING waste collected for recycling increased by 82%, and landfill decreased by 44%.



Plastic waste treatment in Poland

In 2016, 1.7 million tonnes of plastic post-consumer waste were collected through official schemes in order to be treated. From 2006 to 2016, the volumes for recycling increased by x2.4, energy recovery increased by x100 and landfill decreased by 26%.





Plastic PACKAGING waste treatment in Poland

In 2016, 1 million tonnes of plastic post-consumer packaging* waste were collected through official schemes in order to be treated. From 2006 to 2016, the volume of plastic PACKAGING waste collected for recycling increased by 92%, and landfill decreased by 46%.









In 2018, production in all plastics sectors fell after a strong growth in the previous year

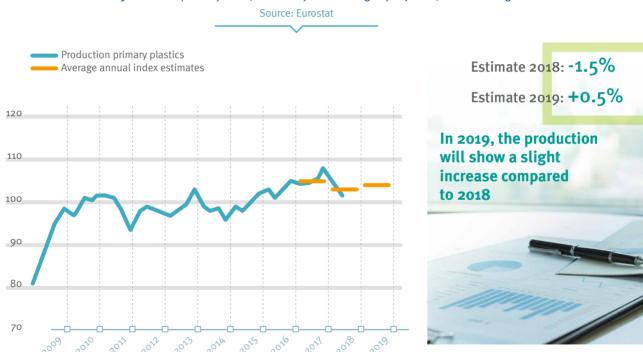
Plastics industry production in EU28 index (2015=100, trend cycle & seasonally adjusted data).



Forecast: after a strong growth in the previous year, a period of consolidation set in 2018

Production of primary plastics, EU28.

Index 2015=100 on a quarterly basis; seasonally and working day adjusted; annual average.



Glossary of terms

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

Plastics Europe 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. Close to 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 355 bn EUR per year.

www.plasticseurope.org



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

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