



## Plastics – the Facts 2019

An analysis of European plastics production, demand and waste data



A woman's profile is shown in silhouette against a blue background. The background features a glowing globe and a network of white lines, suggesting a digital or technological theme. The text is overlaid on the left side of the image.

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<sub>2</sub> 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>



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.

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.



[www.marinelittersolutions.com](http://www.marinelittersolutions.com)



[www.opcleansweep.eu](http://www.opcleansweep.eu)

# Plastics do not belong to the oceans





1

# 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



## 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

## INDUSTRIAL VALUE ADDED

7<sup>th</sup> in Europe

The European plastics industry ranks 7<sup>th</sup> 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

## 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)





Autonomous  
Driving



2

**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)	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)	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)	Silicone
Unsaturated polyesters	Phenol - formaldehyde resins
Epoxy resins	Urea - formaldehyde resins
Melamine resin	Phenolic resins
Vinyl esters	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)

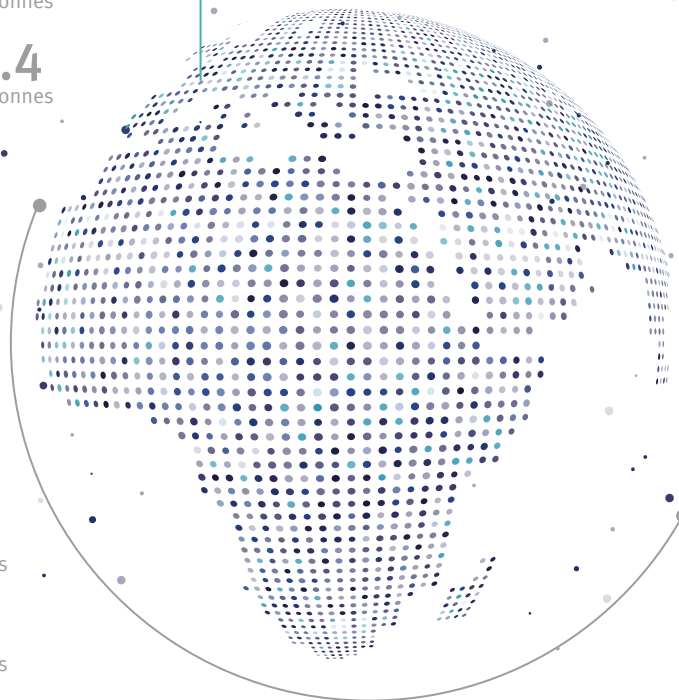
2018 **61.8**  
million tonnes

2017 **64.4**  
million tonnes

## World

2018 **359**  
million tonnes

2017 **348**  
million tonnes



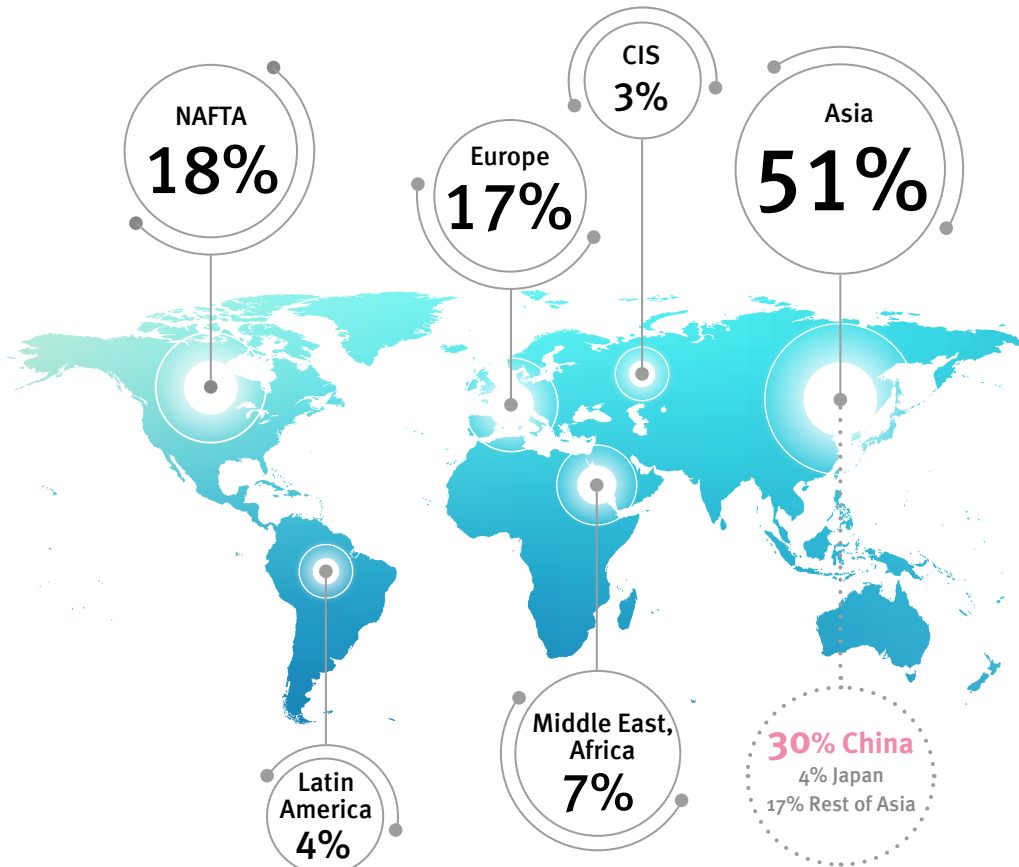
Includes Thermoplastics, Polyurethanes, Thermosets, Elastomers, Adhesives, Coatings and Sealants and PP-Fibers. Not included: PET-fibers, PA-fibers and Polyacryl-fibers.

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.

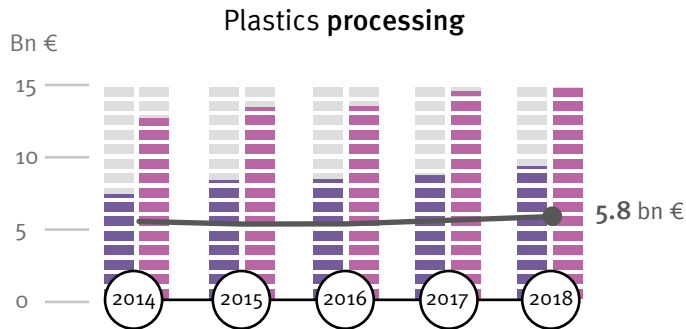
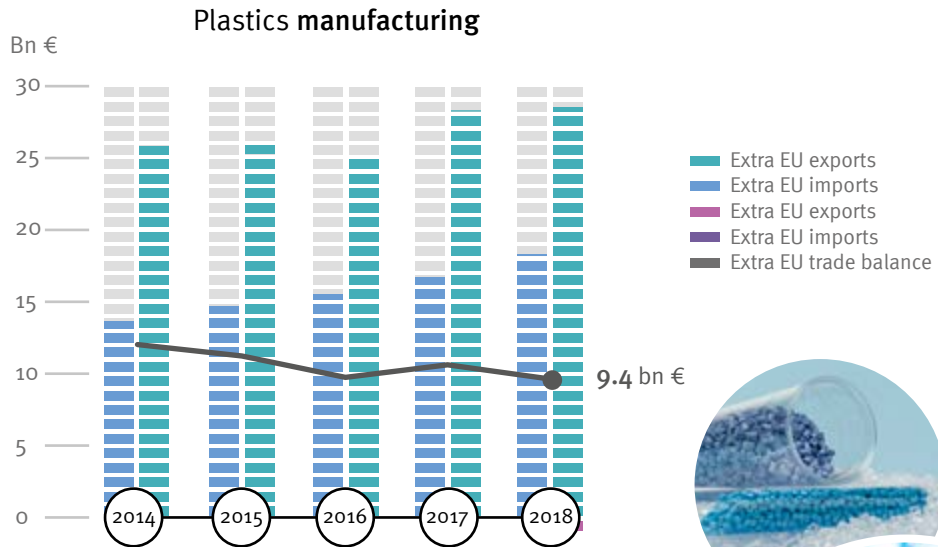
World plastics\* production: 359 million tonnes.



\* 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

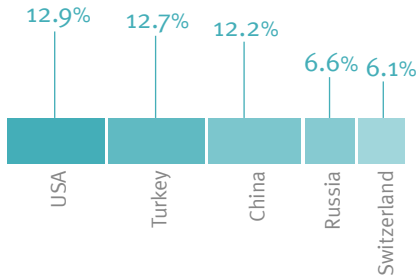
In 2018  
the industry  
reached  
a positive  
trade  
balance of  
more than  
15 billion  
euros



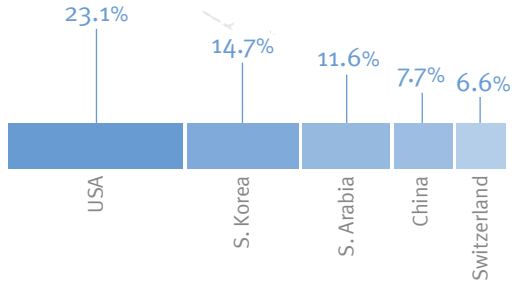




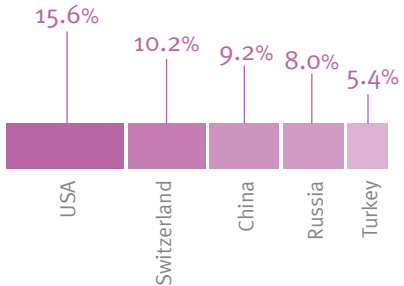
### Plastics manufacturing



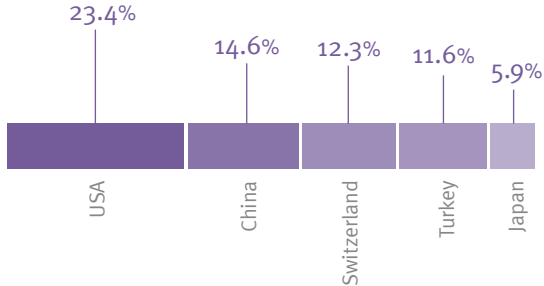
### Plastics manufacturing



### Plastics processing



### Plastics processing



# Top Extra EU trade partners in value

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

SOURCE: Eurostat

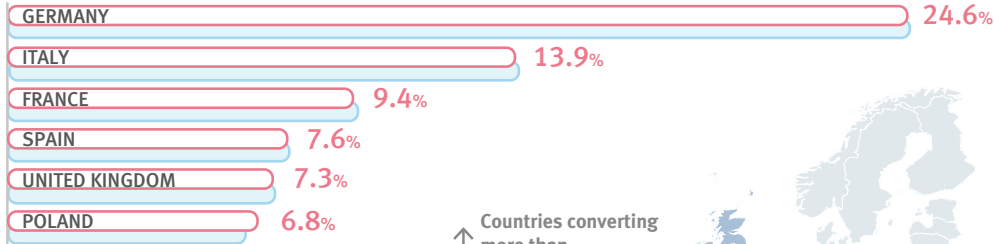


Medical Kit

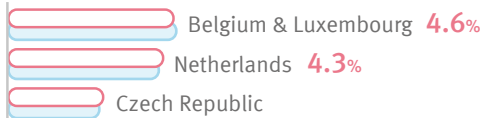
# 51.2 M t

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

2018 2017



Countries converting more than 3 million tonnes



Countries converting less than 0.5 million tonnes



80%

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

\* In terms of population.

## Plastics demand by countries 2018

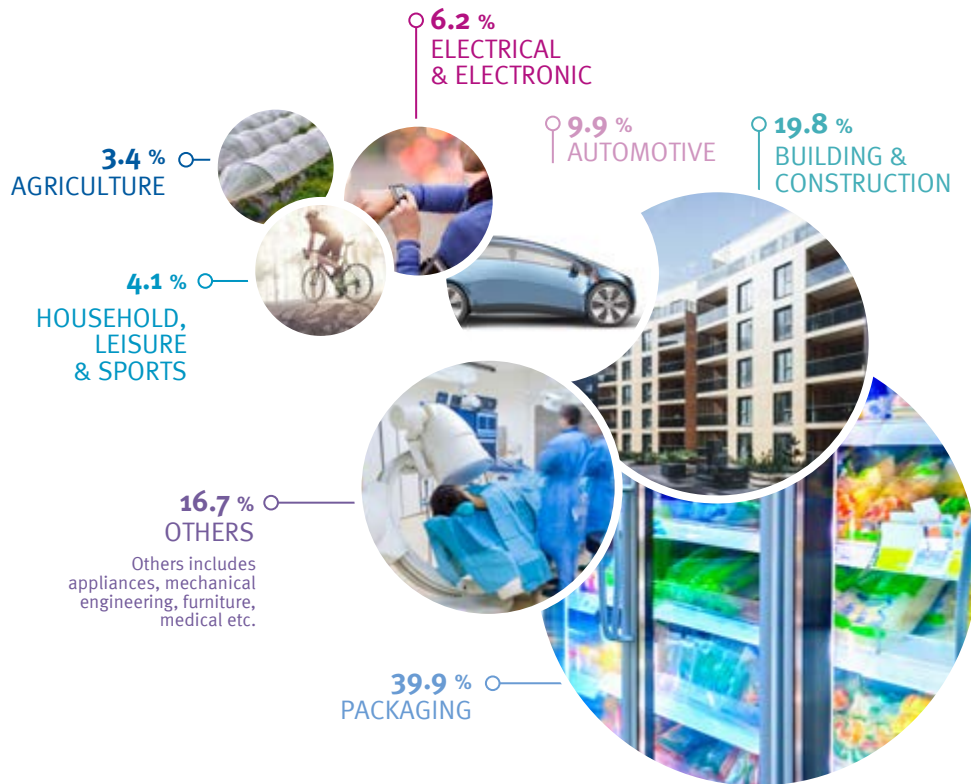
European plastic converters demand includes thermoplastics, polyurethanes and other plastics.

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.

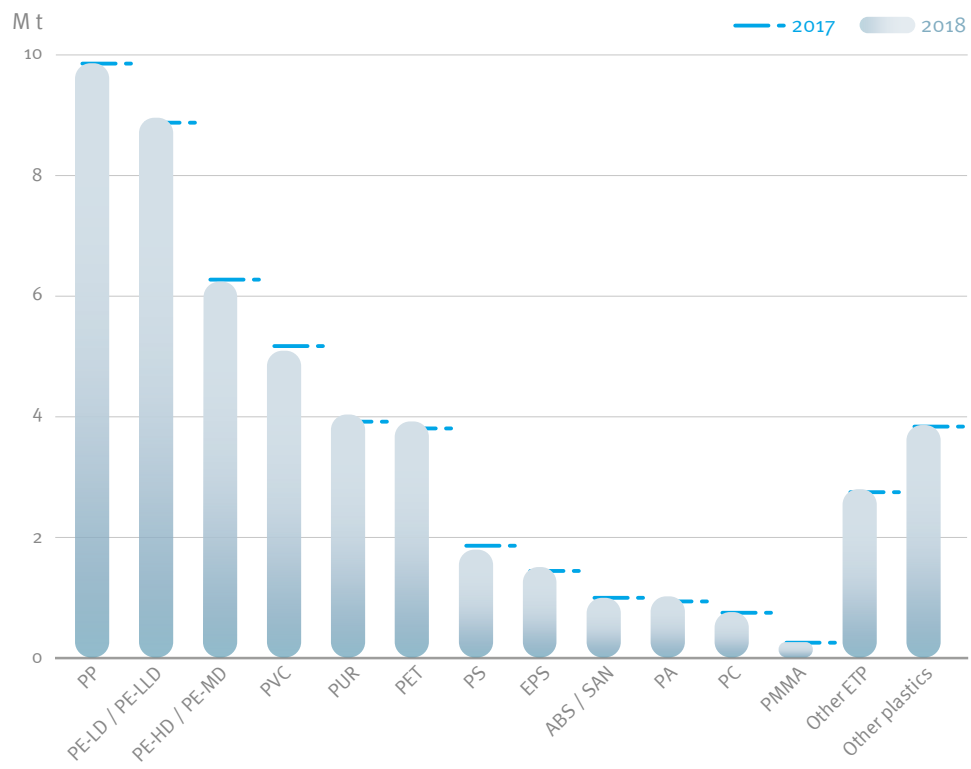


**51.2 M t**  
Total European plastics converters demand

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

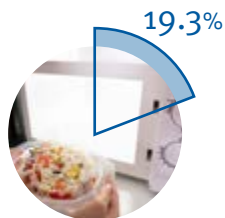
Distribution of European (EU28+NO/CH) plastics converters demand by resin type in 2018.

Leading polymers are the polyolefins (PE & PP).

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

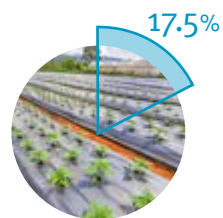
# Plastics demand distribution by resin types 2018

Data for EU28+NO/CH.



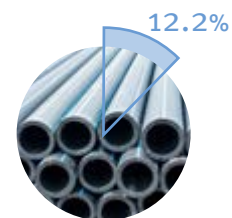
## PP

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



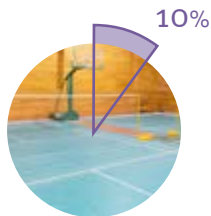
## PE-LD / PE-LLD

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.



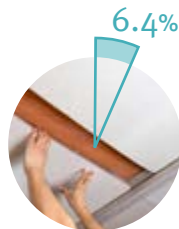
## PUR

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



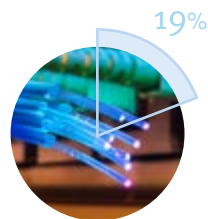
## PET

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.

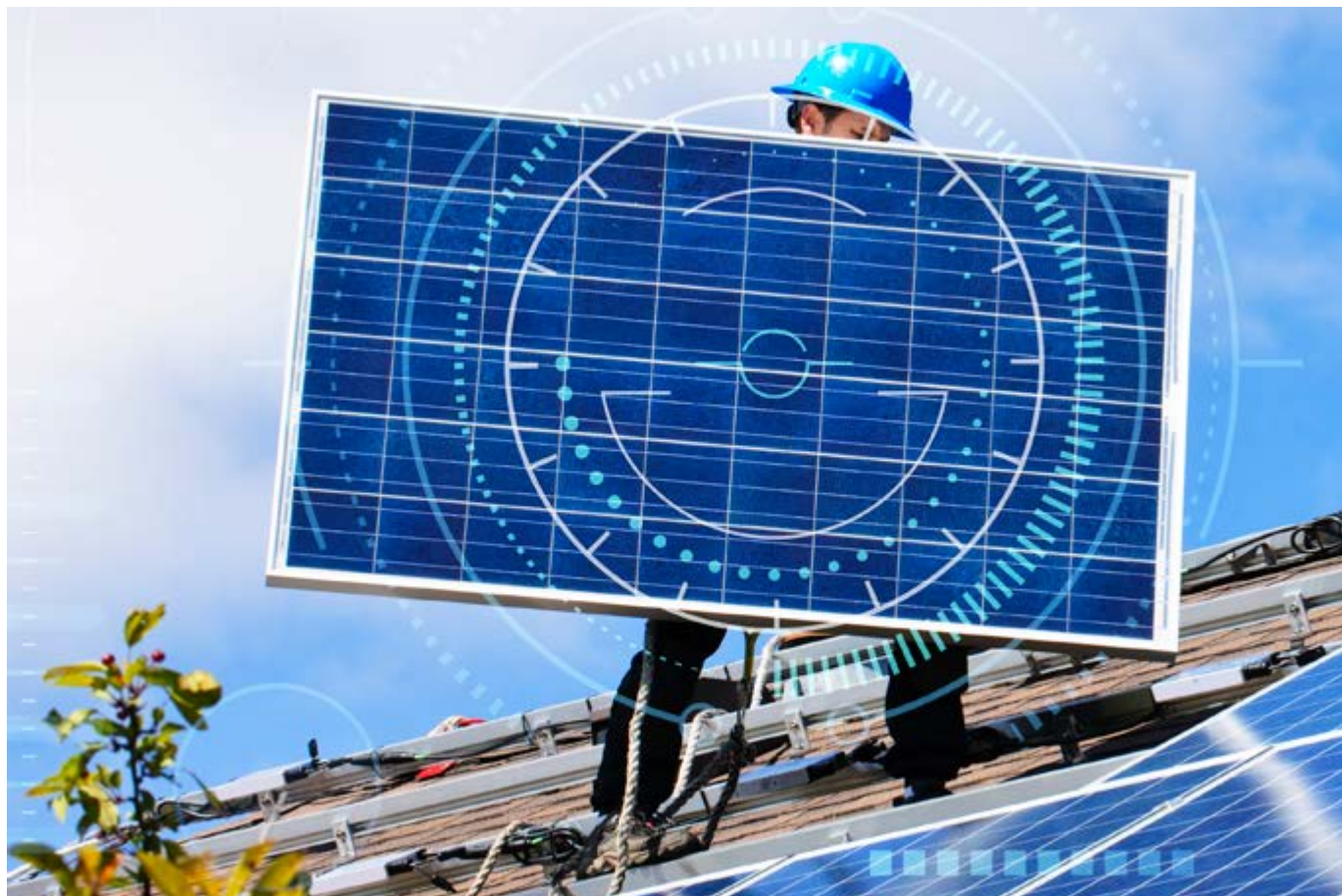
SOURCE: PlasticsEurope Market Research Group (PEMRG) and Conversio Market & Strategy GmbH



# 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







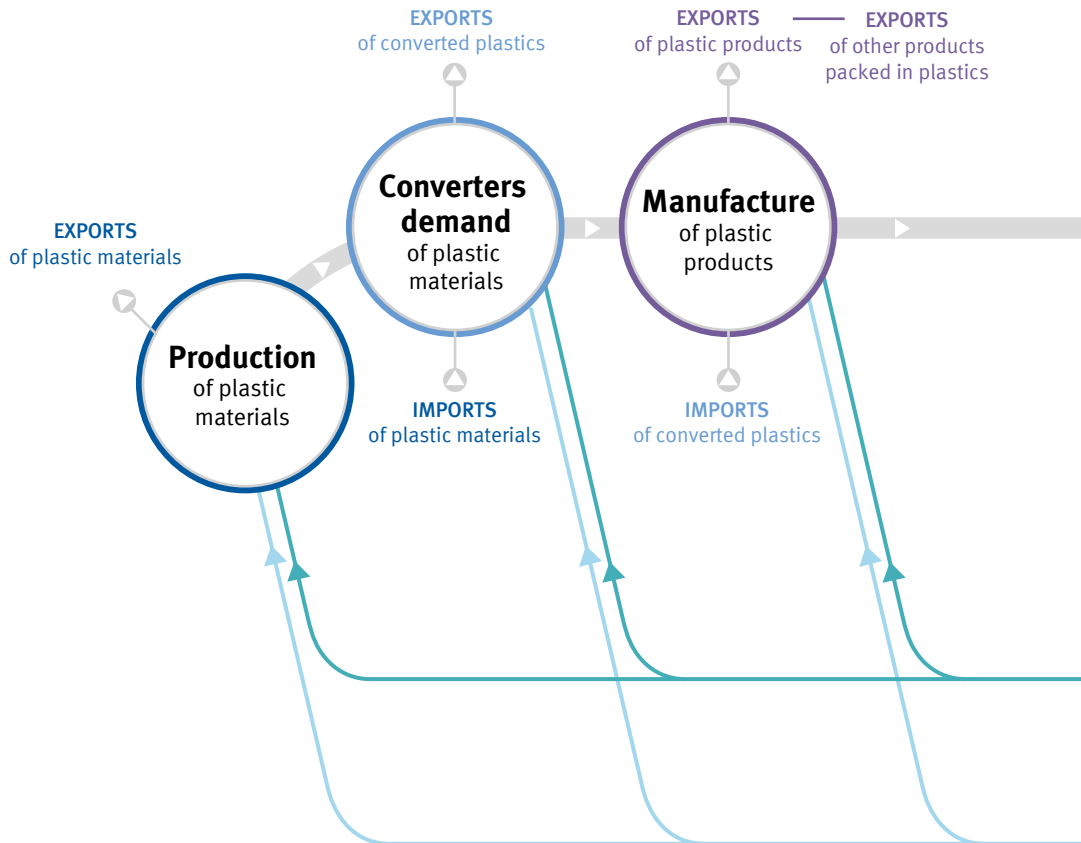
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**From waste  
to resource**

# 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.



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.

## Life service of plastic products

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



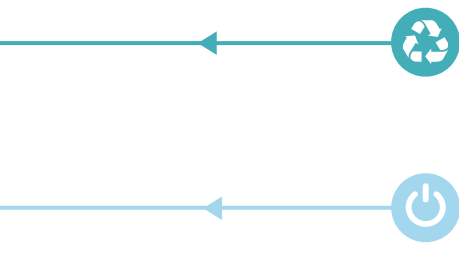
**IMPORTS**  
of converted plastics

**IMPORTS**  
of other products packed in plastics

Plastics become waste at the end of their service life



**NON collected waste\***



**RECYCLING**  
32.5%

**ENERGY RECOVERY**  
42.6%



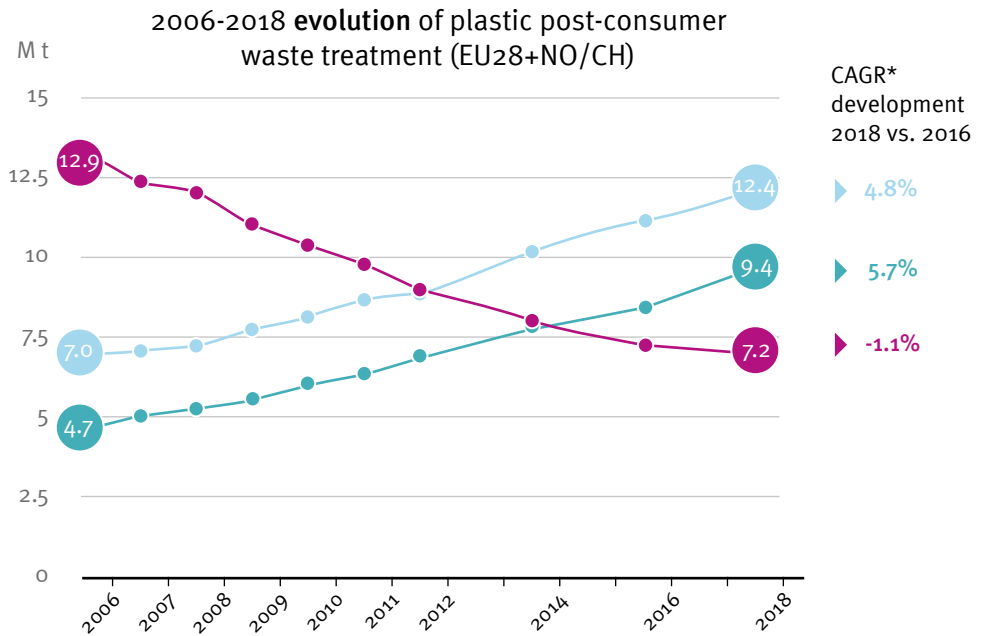
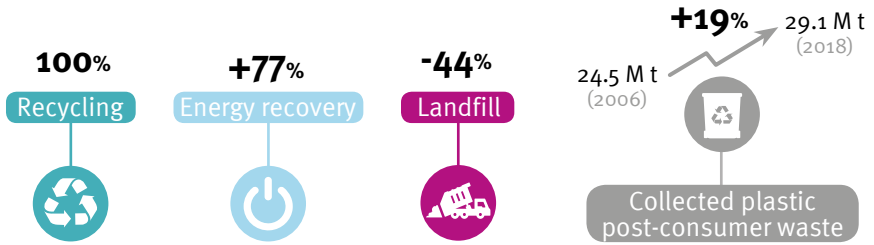
**LANDFILL**  
24.9%



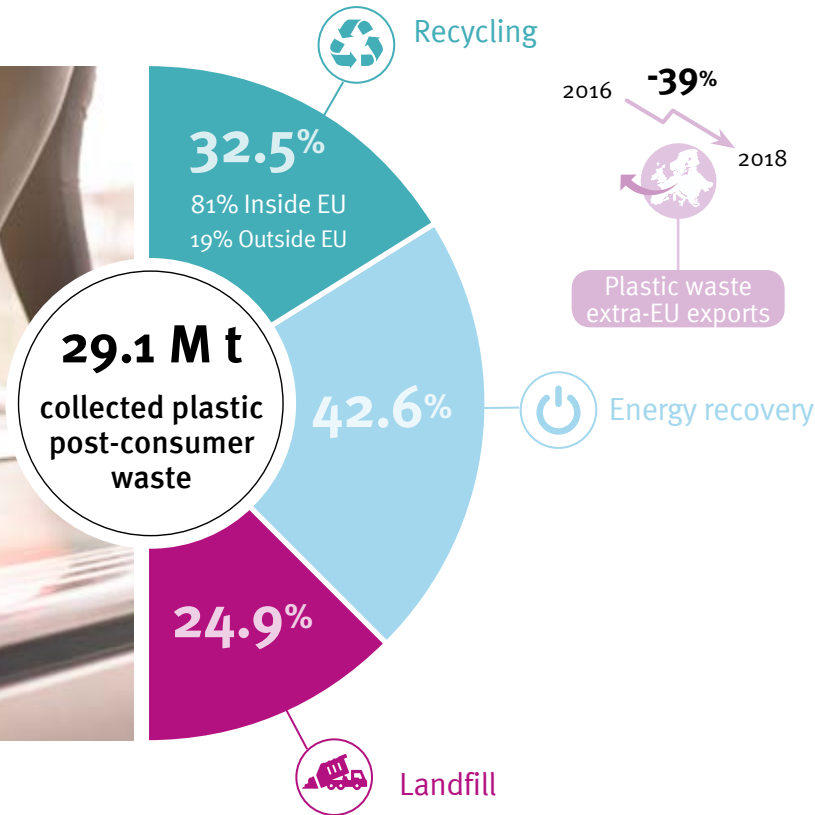
\* Littering and unauthorised dumping

# 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.



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



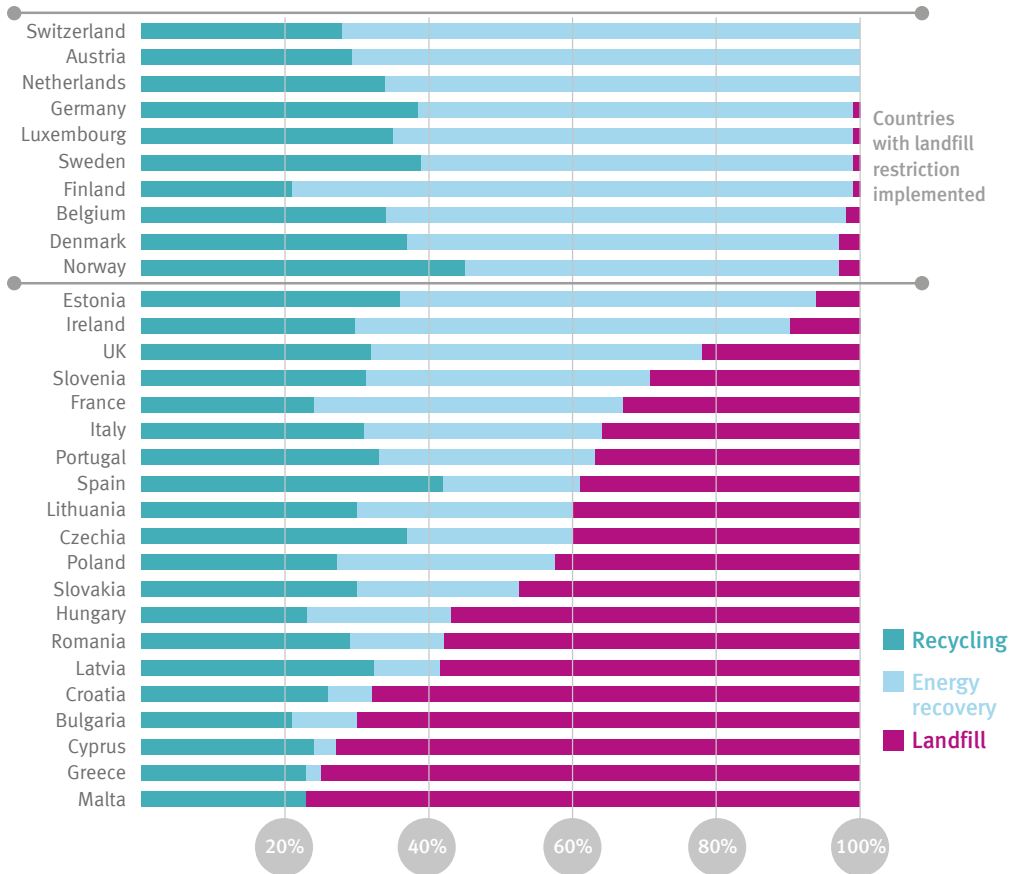
# Plastic post-consumer waste treatment in 2018

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



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



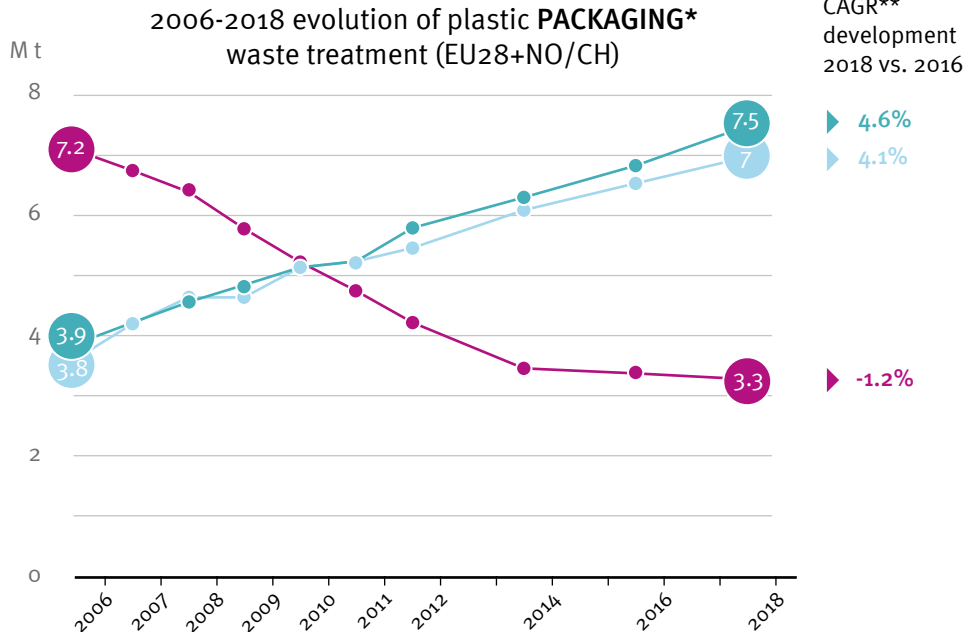
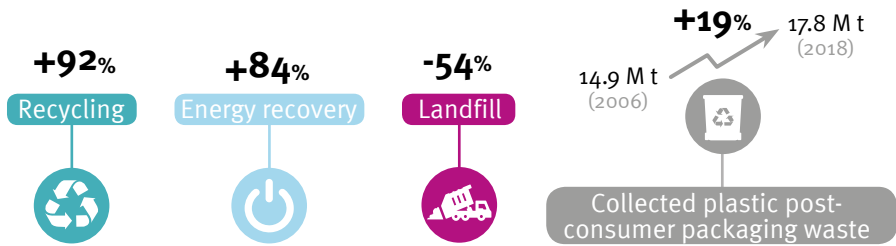
# Zero landfilling is needed to achieve the circular economy of plastics

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.

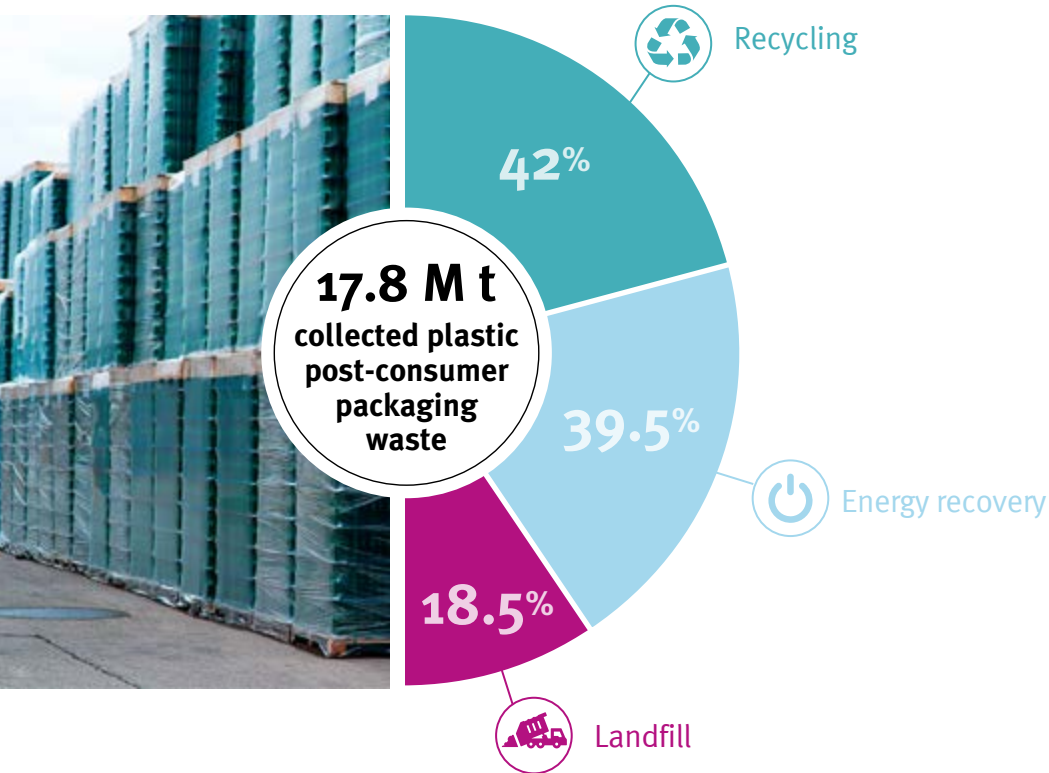


\*From household, industrial and commercial packaging

\*\*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)



# 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.

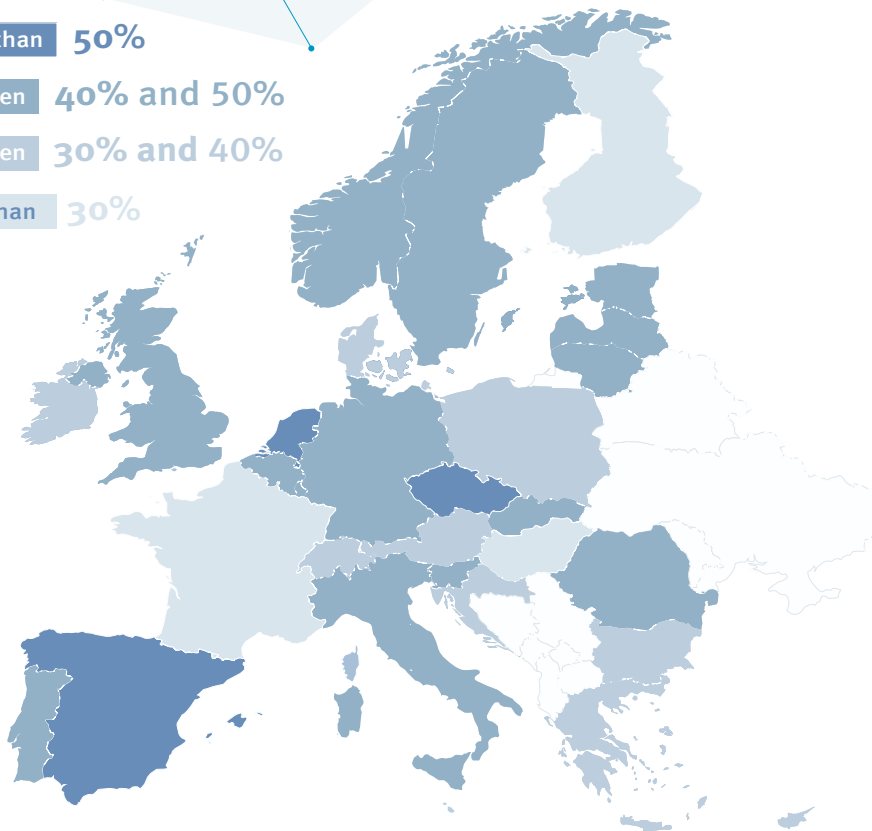
\*From household, industrial and commercial packaging

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

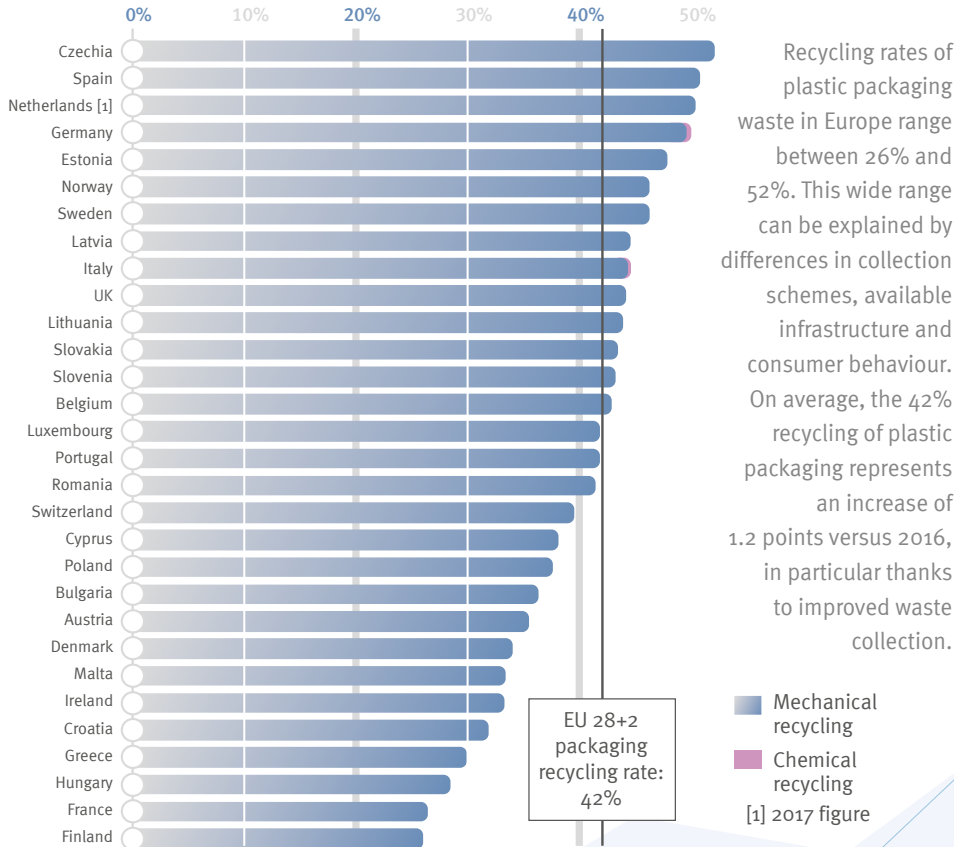
In 2018, 17 countries had recycling rates higher than 40% and 3 countries higher than 50%.

Plastic **PACKAGING** recycling rates across Europe

-  **More than 50%**
-  **Between 40% and 50%**
-  **Between 30% and 40%**
-  **Less than 30%**



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



## 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.

\* From household, industrial and commercial packaging

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





# 4

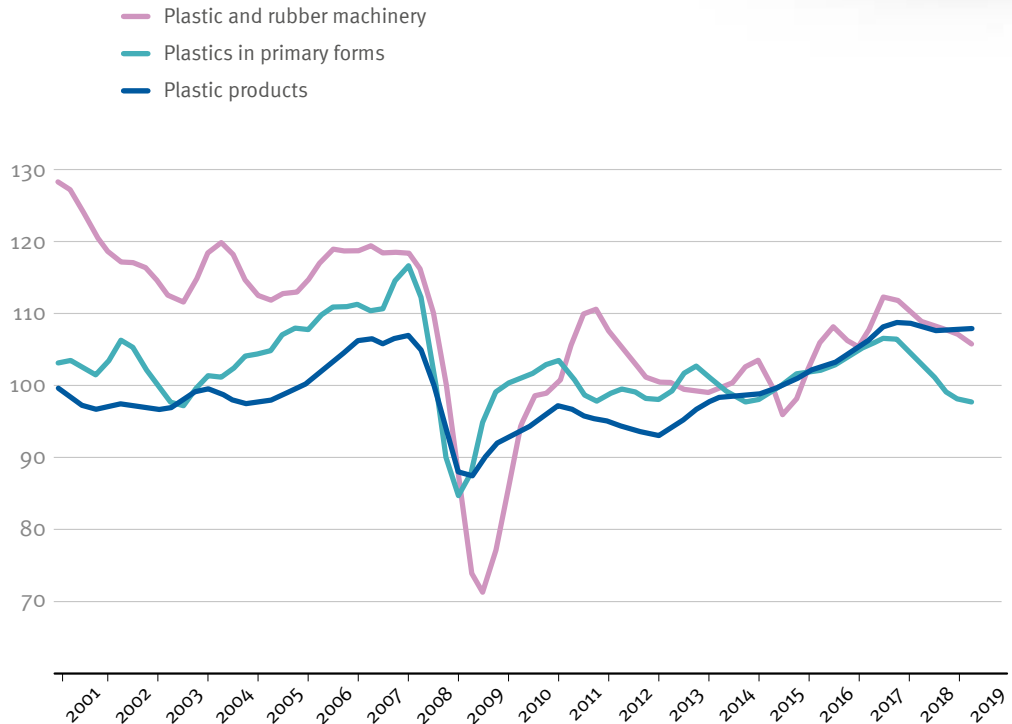
## Snapshot and outlooks



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

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

SOURCE: Eurostat

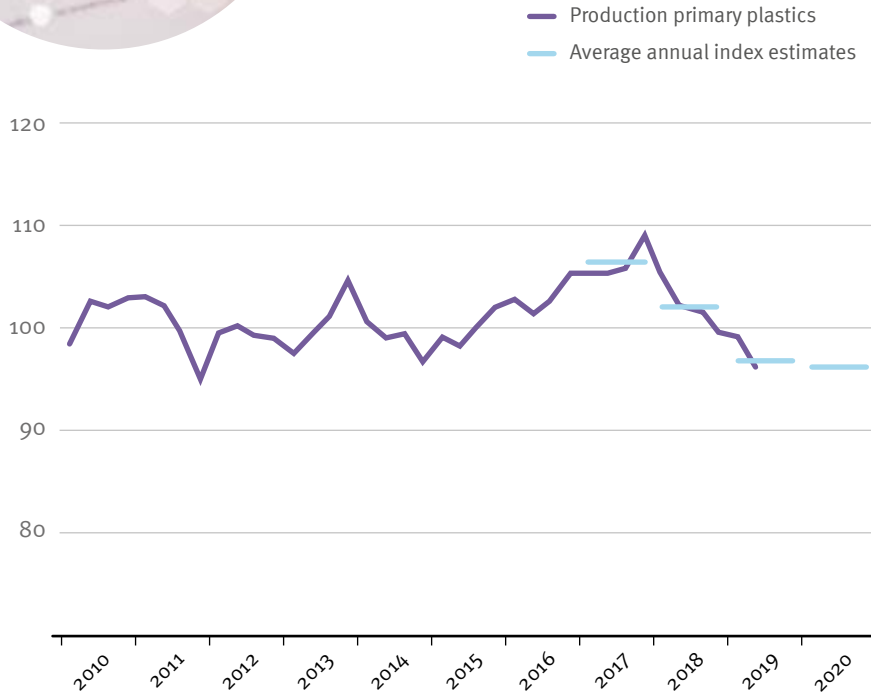




Estimated growth rate:

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

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



# 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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 /plasticseurope



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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and **Messe Düsseldorf**.

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