



Plastics – the Facts 2014

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 plastics 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), EuPC (the European Plastics Converters) and EPRO (the European Association of Plastics Recycling and Recovery Organisations). PlasticsEurope's Market Research and Statistics Group (PEMRG) provided input on the production of and demand for plastics raw materials. Consultic Marketing & Industrieberatung GmbH helped assess waste generation 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.

Plastics – the material for the 21st century





For the last 150 years, plastics materials have been key enablers for innovation and have contributed to the development and progress of society.

Discover how plastics have changed the world.

www.plasticseurope.org

Key figures of the European plastics industry

The European plastics industry includes plastics raw material producers, plastics converters and plastics machinery manufacturers in the EU27 member States.

Jobs

The plastics industry gives direct employment to over

1.45 million



people
in Europe

Companies

An industry in which more

than **60.000**
companies
operate, most
of them SME's



Turnover

The European plastics industry had a turnover of

320 billion euro
in 2013



Multiplier effect

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



Innovation

The plastics sector is part of the **top 5** most innovative sector in the EU representing 1 in 25 patents submitted by the industry between 2003 and 2012



Recycling

More than **6.6** million tonnes of plastics waste recycled in 2012

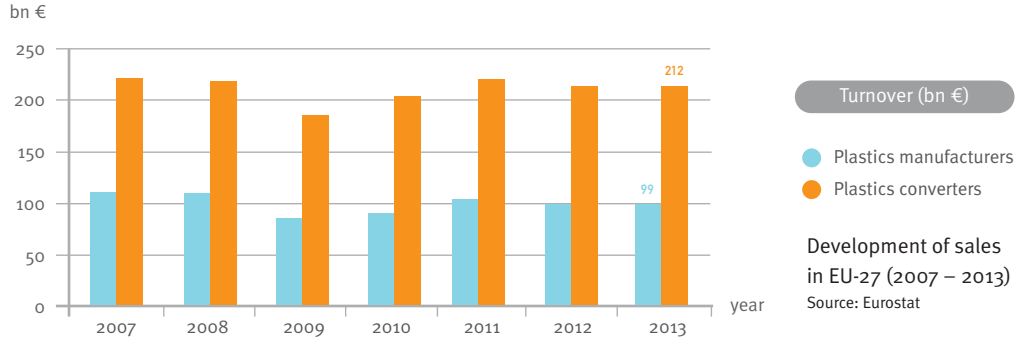


* 2013, The European House Ambrosetti study, data for Italy, 2013

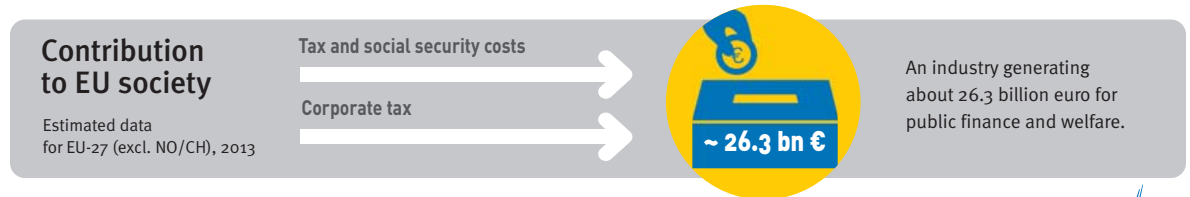
Plastics: jobs, growth and competitiveness



The European plastics industry: a pillar of economics and society



Number of employees in 2013



Source: 1. Eurostat.

Plastics are a source of jobs, growth, innovation and sustainability

The growth of the plastics industry has a multiplier effect on numerous important sectors of the European economy. The plastics industry is a key enabler of innovation of many products and technologies in other sectors of the economy like healthcare, energy generation, aerospace, automotive, maritime, construction, electronics, packaging or textile.

None of these sector would innovate and grow as much as they do without plastic materials and solutions. Innovation and growth in Europe depend on manufacturing, in particular the plastics industry. A study led in 2013 by leading Italian think tank “The European House Ambrosetti” reveals the “multiplier effect” of the plastics industry:

- It is in one of the sectors that provides the greatest contribution to EU manufacturing
- A 10% increase in the value added of the European plastics sector could lead to a 4.4% increase in the value added to the overall EU manufacturing sector.

And at national level for Italy:

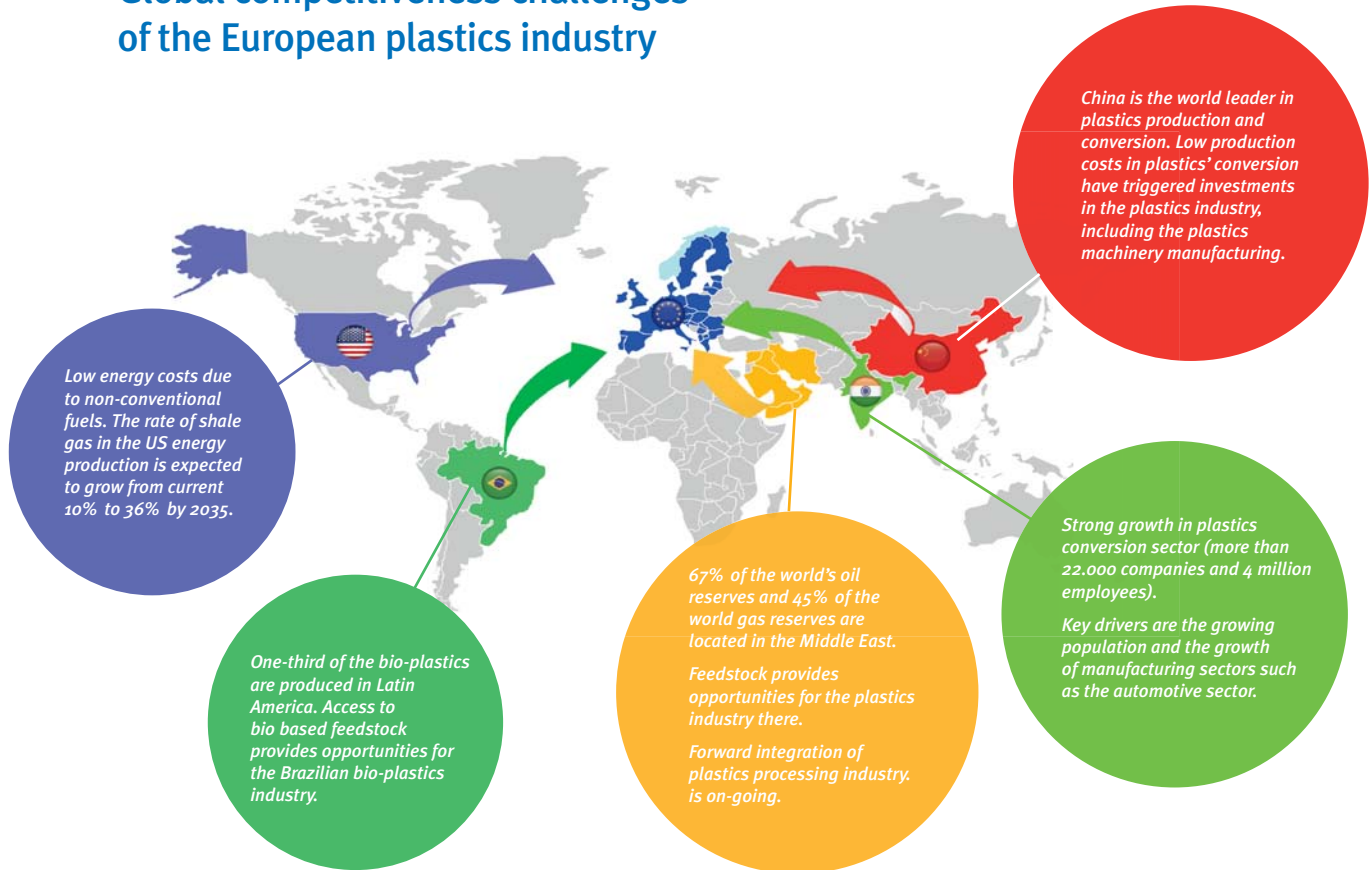
- For every job created in the plastics sector, almost 3 jobs are created in the wider economy
- A 100€ increase in GDP in the national plastics supply chain generates 238€ of GDP in the national economy

Moreover, the unique characteristics of plastics also allow them to make a strong contribution to a more environmentally sustainable and resource efficient Europe. Lightweight, versatile and durable plastics contribute to energy and resource savings in strategic sectors like retail, construction, healthcare, automotive or renewable energies. In addition, significant advances are also being made in the environmental performance of plastics in their production and end-of-life phases, hence contributing to the sustainability of European industries and societies.

THE MULTIPLIER EFFECT OF PLASTICS FOR SOCIETY AND THE ECONOMY



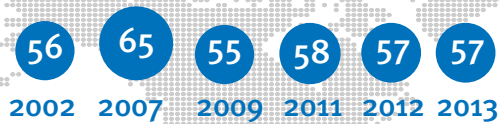
Global competitiveness challenges of the European plastics industry



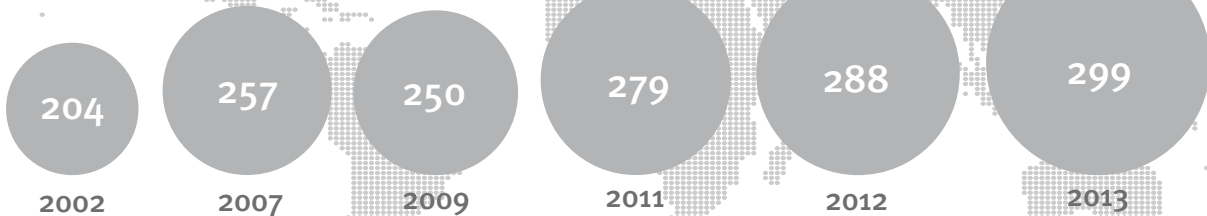
Plastics market data



Plastics production grows globally and is stable in Europe



EUROPEAN PLASTICS PRODUCTION in Mtonne



WORLD PLASTICS PRODUCTION in Mtonne

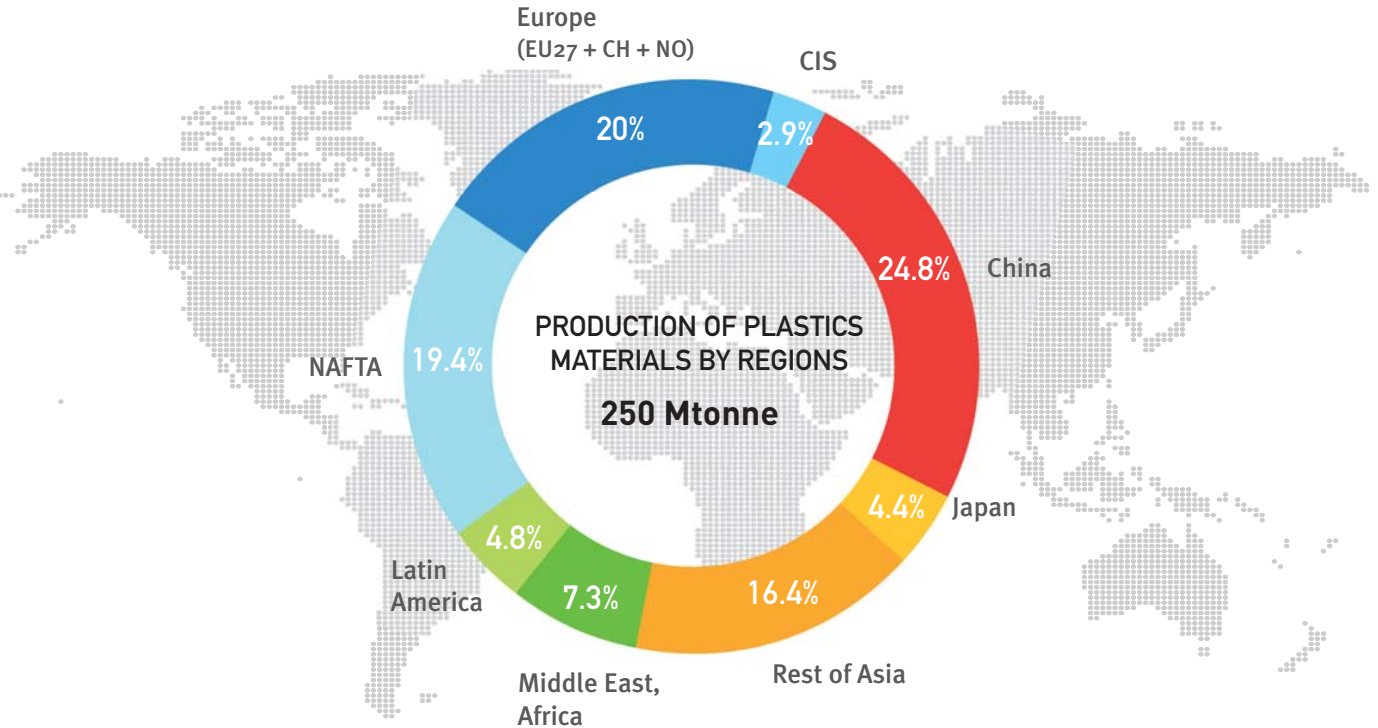
World and European plastics production 2002-2013
Includes Plastics materials (thermoplastics and polyurethanes),
other plastics (thermosets, adhesives, coatings and sealants)
and PP-fibers.

Source: PlasticsEurope (PEMRG) / Consultic

With continuous growth for more than 50 years, global production in 2013 rose to 299 million tonnes, meaning a 3.9% increase compared to 2012.

In Europe, the plastic production stabilised in 2013 after the 2009 turn-down. Actual levels are similar to those in 2002.

Europe ranks second in the global plastics materials production



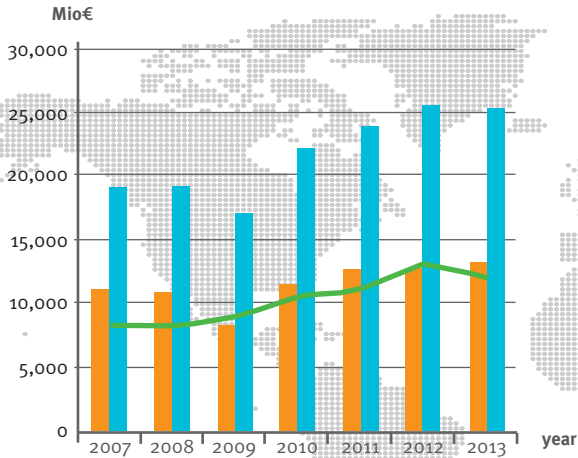
2013 World production of plastics materials (thermoplastics and polyurethanes)

Does not include other plastics (thermosets, adhesives, coatings and sealants) nor PP-fibers.

Source: PlasticsEurope (PEMRG) / Consultic

A positive trade balance of 18 billion euros

Plastics manufacturing extra-EU

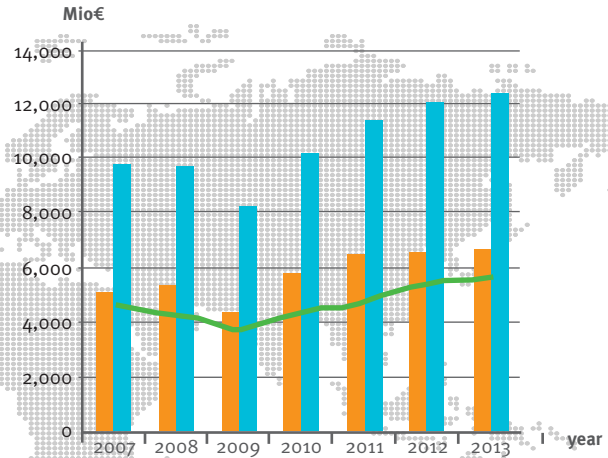


- Extra-EU27 Imports
- Extra-EU27 Exports
- Trade balance

EU-27 plastics industry: trade balance with non-EU member countries (Extra-EU)

Source: Eurostat

Plastics processing Extra-EU

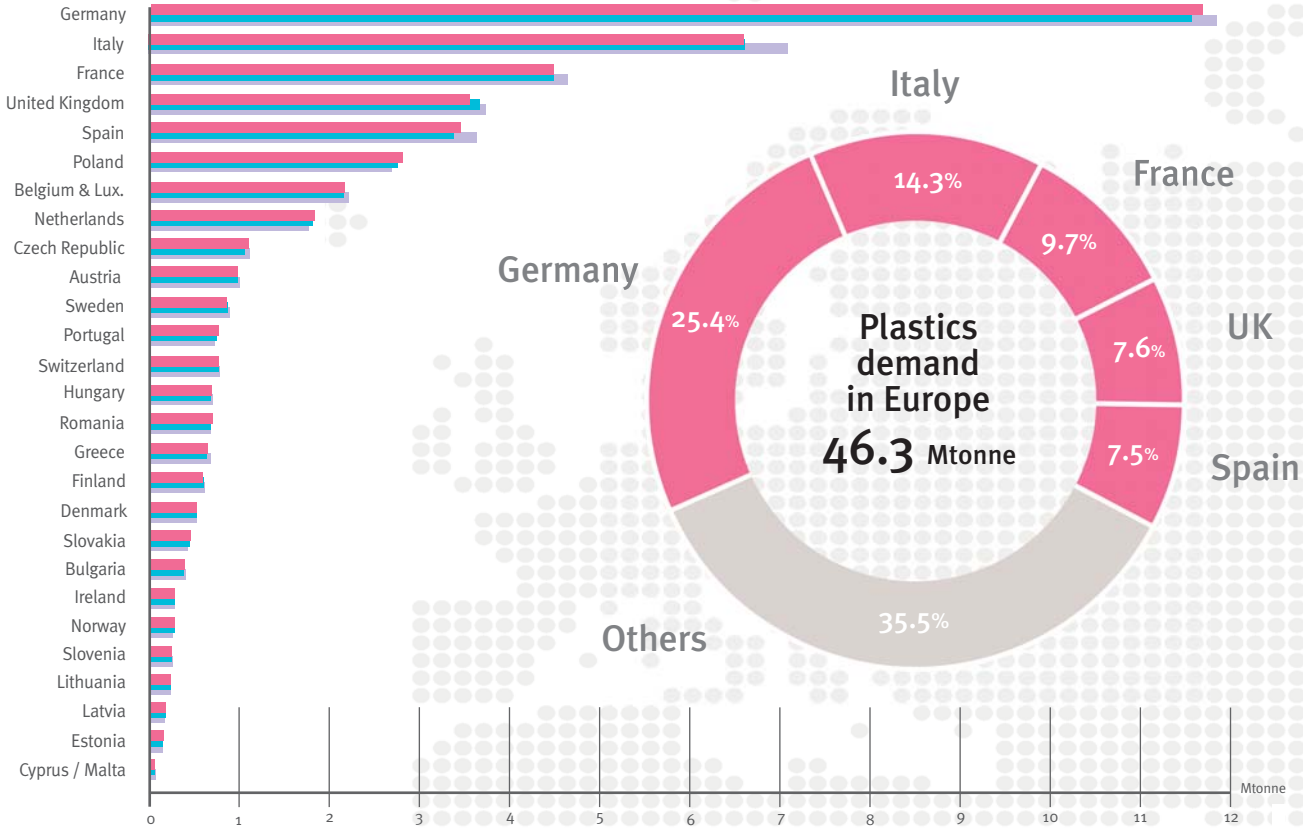


2013 top trade partners

Source: Eurostat

	Plastics manufacturing	Plastics processing
Exports Extra EU27	1. Turkey (14.3%)	1. USA (12.6%)
	2. China (11.8%)	2. Russia (11.4%)
	3. USA (10.3%)	3. Switzerland (11.3%)
	4. Russia (8.5%)	4. China (7.7%)
	5. Switzerland (6.3%)	5. Turkey (5.7%)
Imports Extra EU27	1. USA (23.9%)	1. USA (21.7%)
	2. Saudi Arabia (15.8%)	2. Switzerland (15.5%)
	3. South Korea (10.4%)	3. China (12.8%)
	4. Switzerland (6.7%)	4. Turkey (10.7%)
	5. Japan (5.7%)	5. Japan (6.6%)

Two thirds of plastics demand in Europe is concentrated in five countries



European plastics demand by country (Mtonne/year)

Source: PlasticsEurope (PEMRG) / Consultic / ECEBD

● 2013 ● 2012 ● 2011

Plastics provide for a wide variety of markets

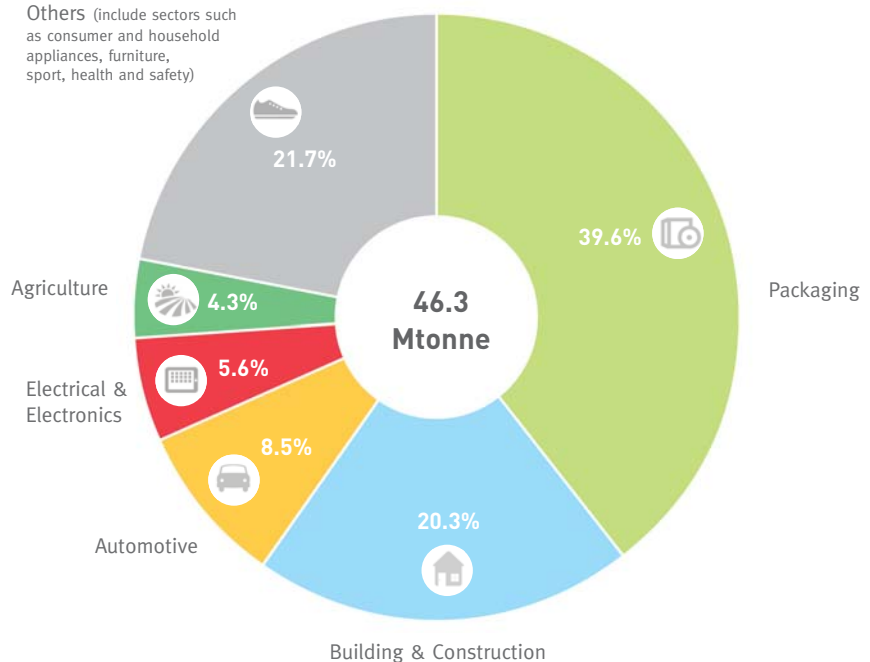
In Europe, packaging applications are the largest application sector for the plastics industry and represent 39.6% of the total plastics demand.

Building and construction is the second largest application sector with 20.3% of the total European demand.

Automotive is the third sector with a share of 8.5% of the total demand.

Electrical and electronic applications represent 5.6% of the plastics demand and are closely followed by agricultural applications which have a share of 4.3%.

Other application sectors such as appliances, household and consumer products, furniture and medical products comprise a total of 21.7% of the European plastics demand.

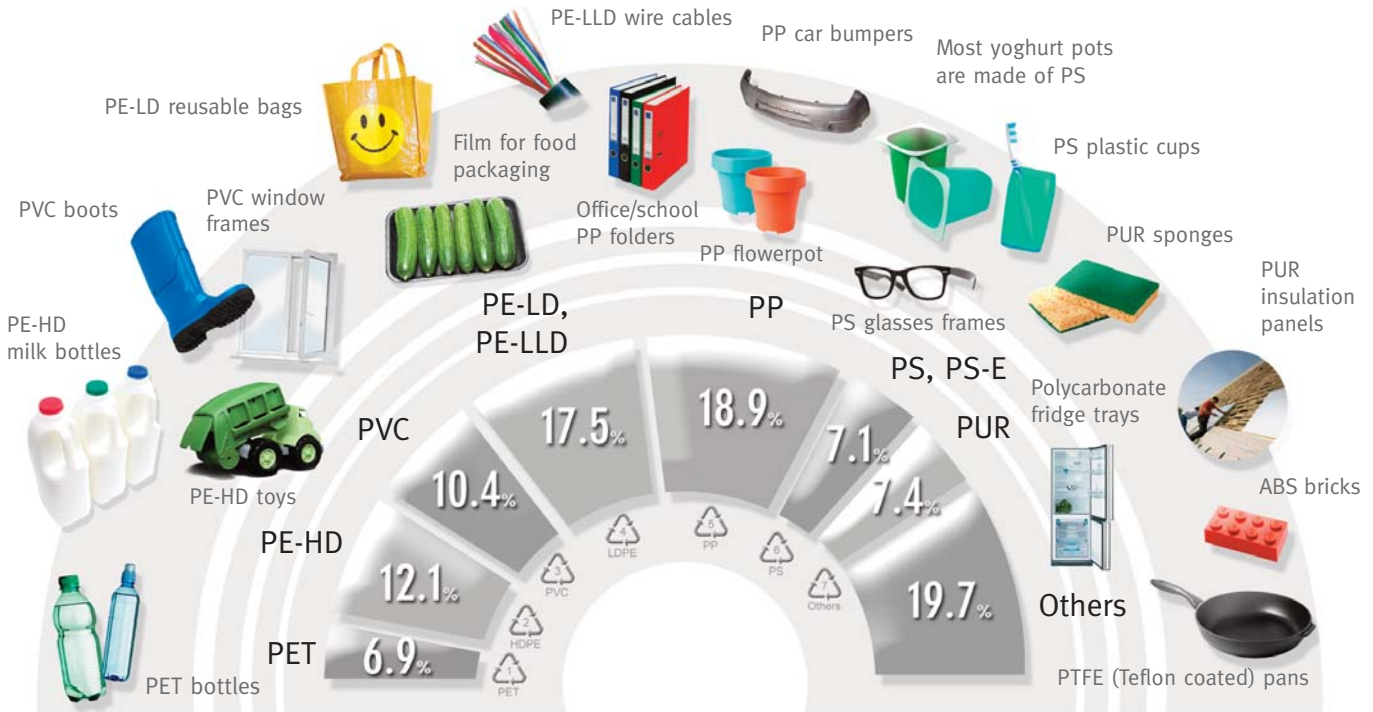


European plastics demand* by segment 2013

Source: PlasticsEurope (PEMRG) / Consultic / ECEBD

* EU-27+NO/CH

Different plastics for different needs

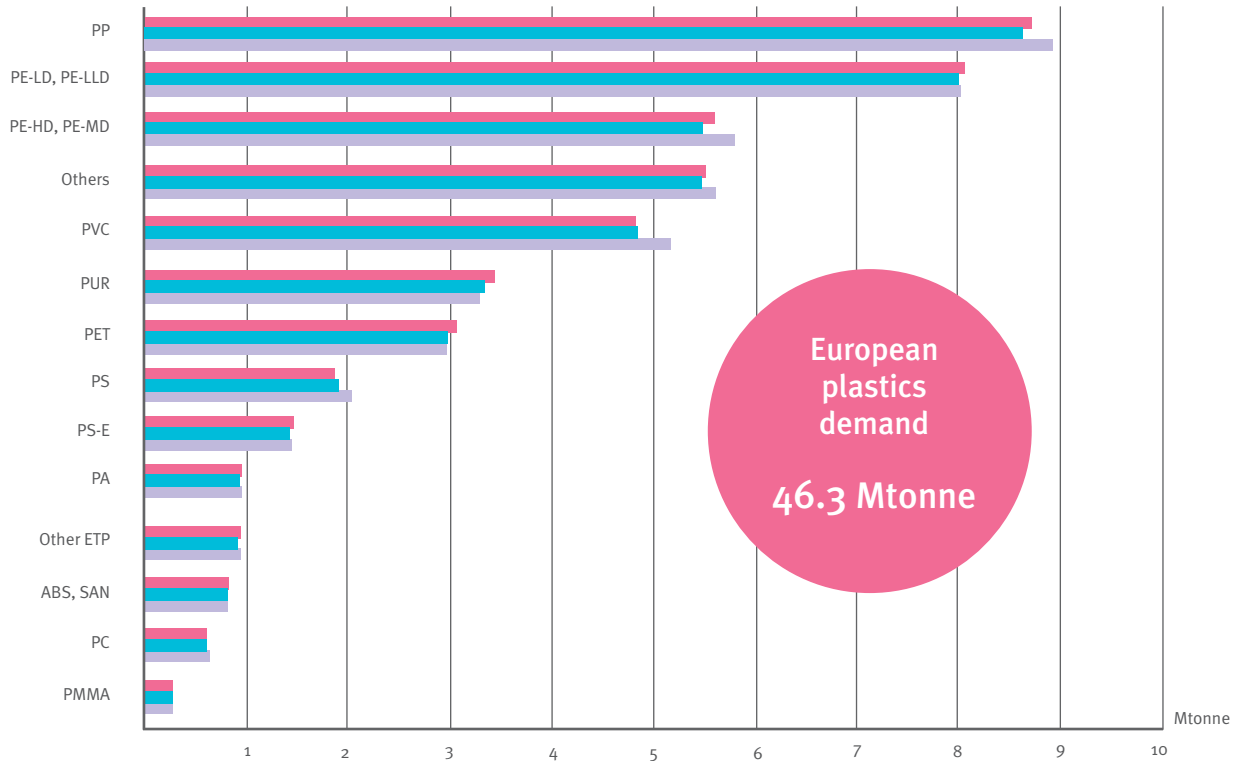


European plastics demand* by polymer type 2013

Source: PlasticsEurope (PEMRG) / Consultic / ECEBD

* EU-27+NO/CH

European plastics demand increased by 1% in 2013



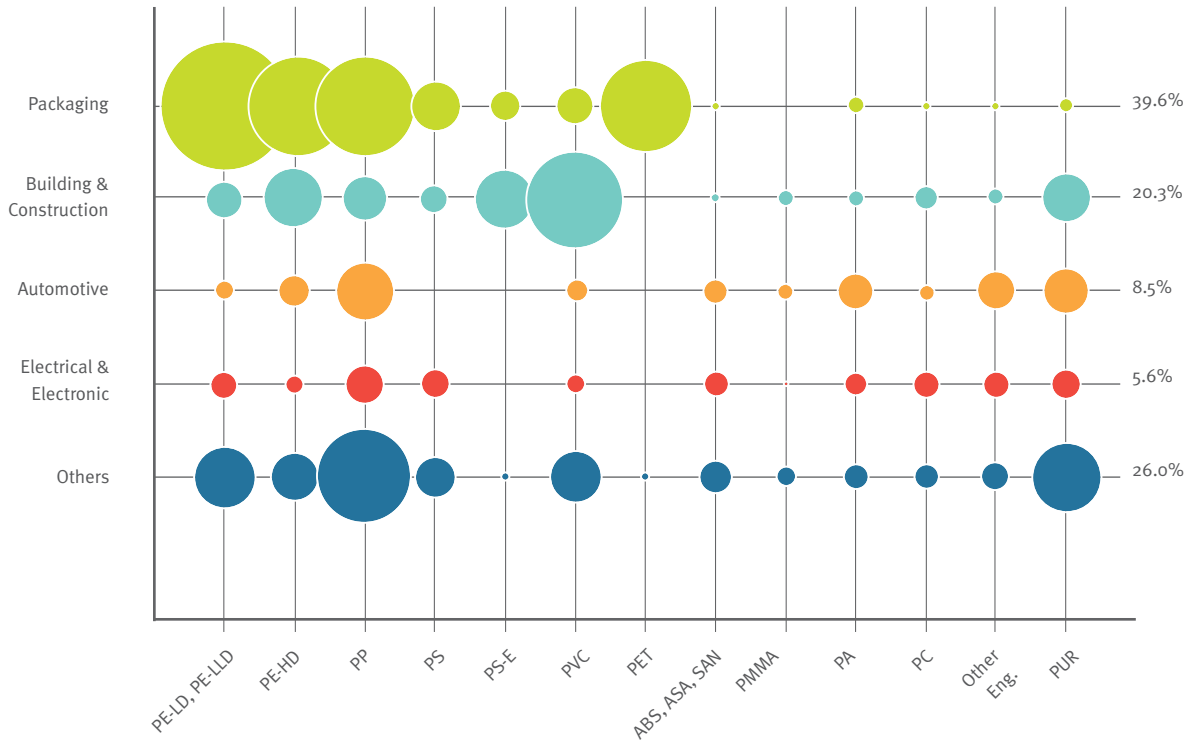
European plastics demand* by polymer type

Source: PlasticsEurope (PEMRG) / Consultic / ECEBD

* EU-27+NO/CH

● 2013 ● 2012 ● 2011

Packaging, building & construction and automotive are the top three markets for plastics



European plastics demand* by segment and polymer type 2013

Source: PlasticsEurope (PEMRG) / Consultic / ECEBD

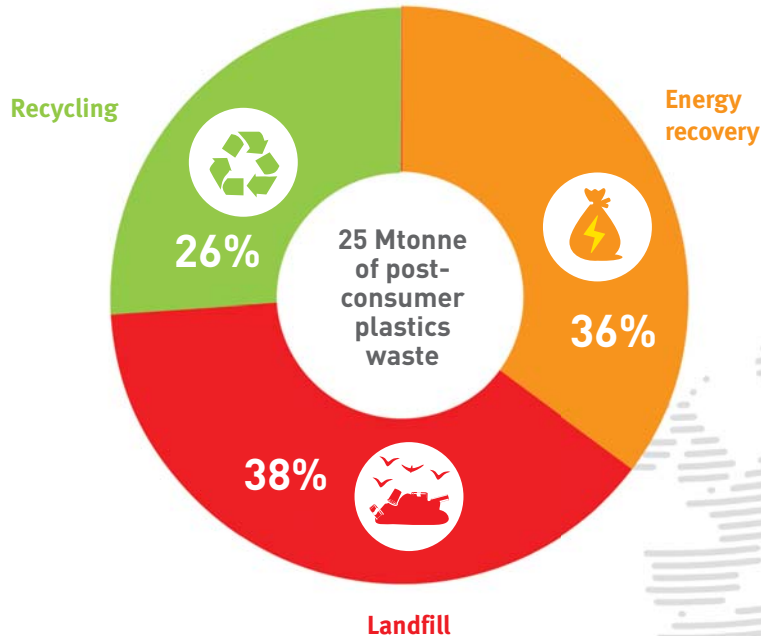
* EU-27+NO/CH

Waste management data



In 2012 plastics recycling and energy recovery reached 62%

In 2012, 25.2 million tonnes of post-consumer plastics waste ended up in the waste upstream. 62% was recovered through recycling and energy recovery processes while 38% still went to landfill.

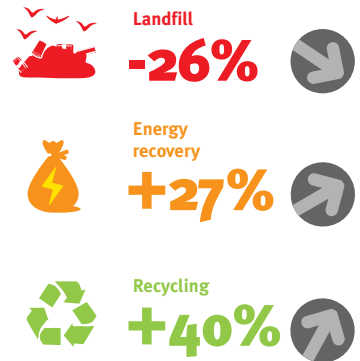
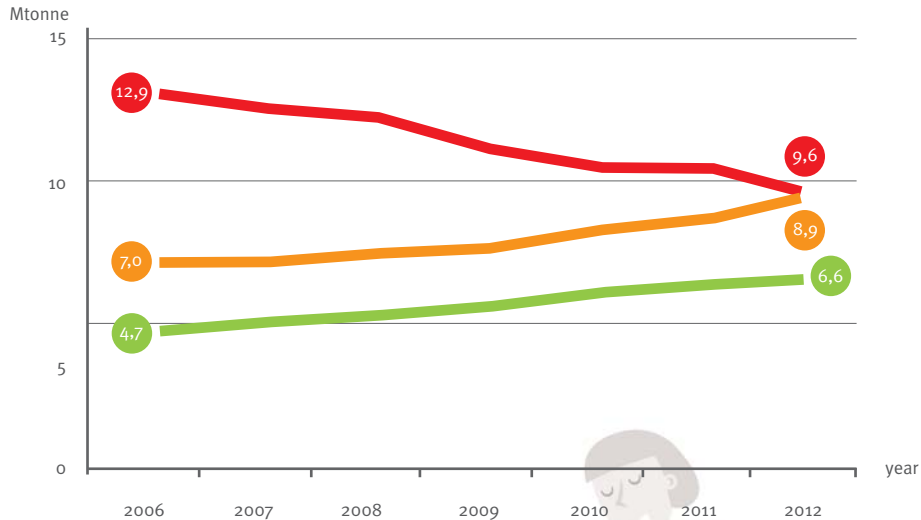


Treatment for post-consumer plastics waste in the EU27+Norway and Switzerland

Source: Consultic

Since 2006 recycling and energy recovery have increased...

The annual average of post-consumer plastics waste generation from 2006 to 2012 is 25 Mtonne.

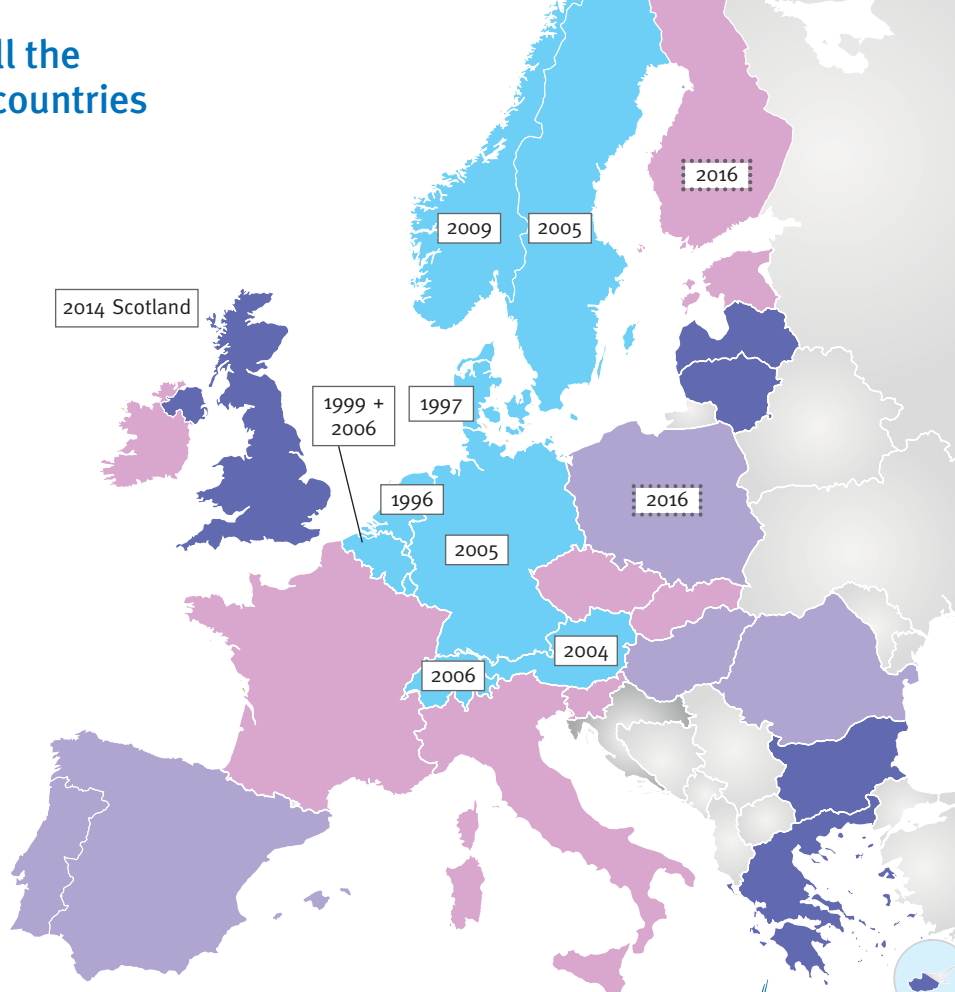
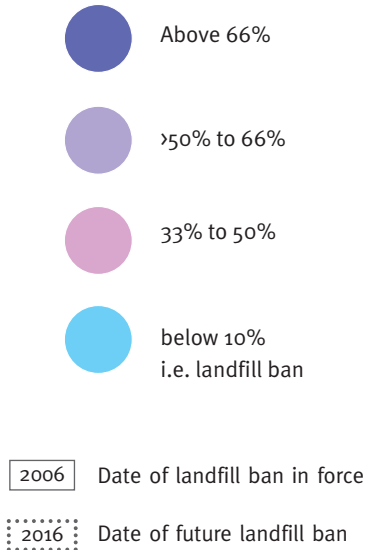


Total plastics waste recycling and recovery 2006 – 2012

Source: Consultic

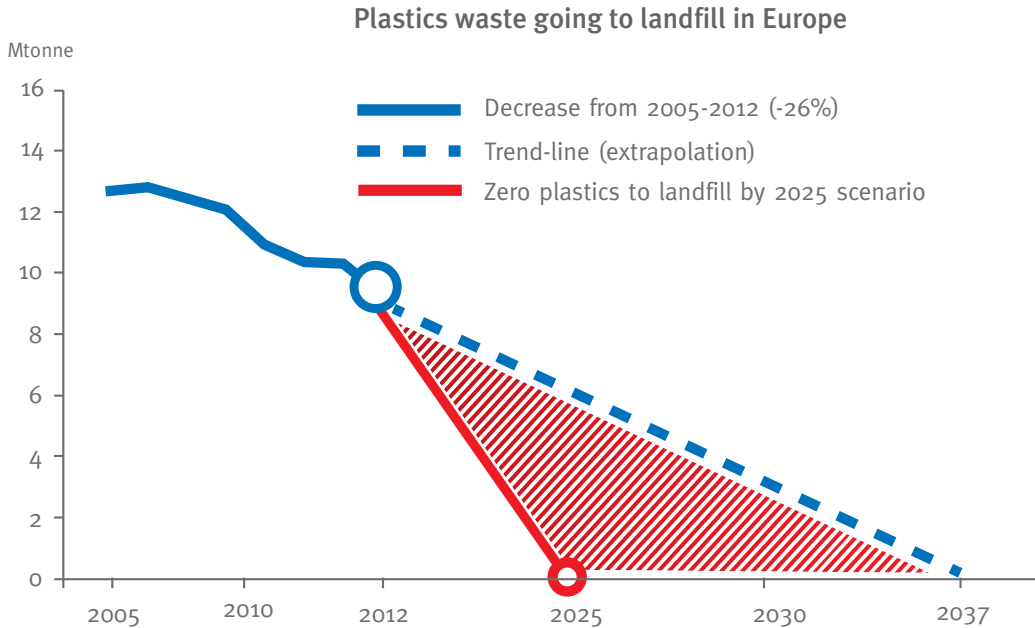
... but landfilling is still the 1st option in many EU countries

Plastics waste going to landfill (2012)



Source: Consultic

Zero plastics to landfill, a challenging but worthwhile goal



 = 60 million tonnes of plastics prevented from landfill, equivalent to over 750 million barrels of oil or 60 billion euros

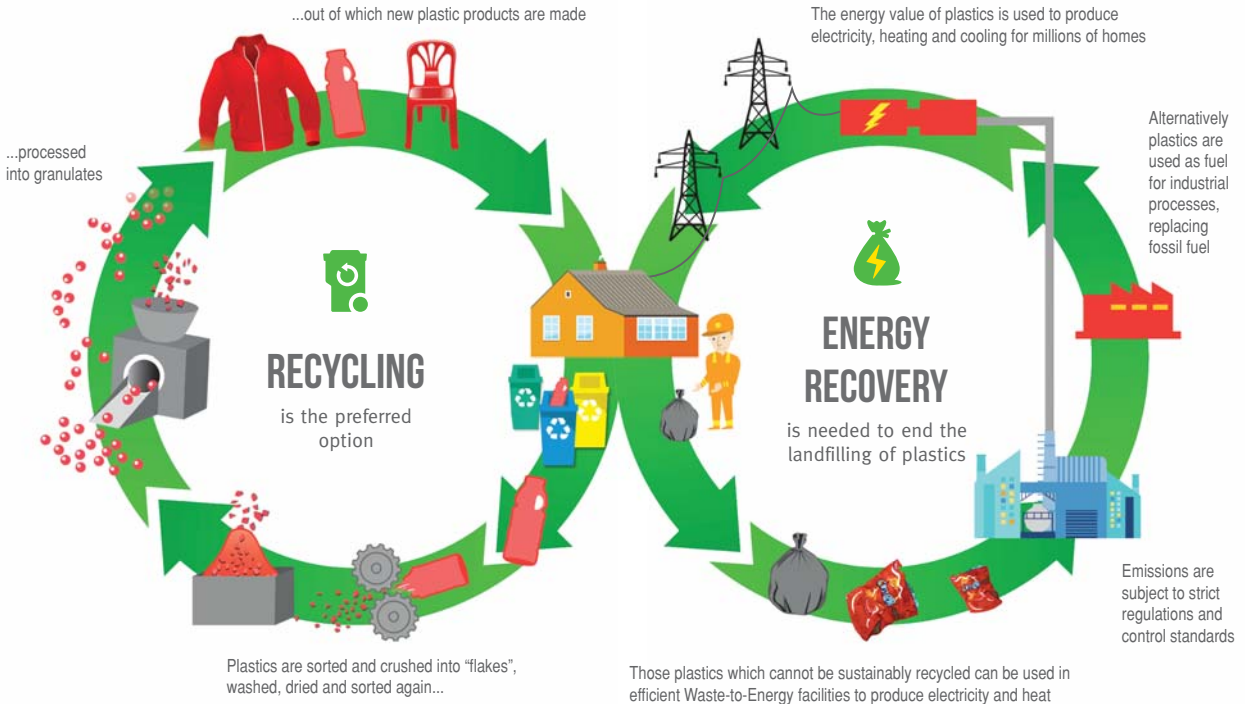
In general, countries with landfill ban achieve higher recycling rates



Treatment of post-consumer plastics waste 2012
(EU-27 + CH/NO)
Source: Consultic

- Recycling rate
- Energy recovery rate
- Landfill rate

Plastics waste is a resource



9.6 MILLION TONNES

of plastics waste are landfilled every year in Europe

16-19 MILLION

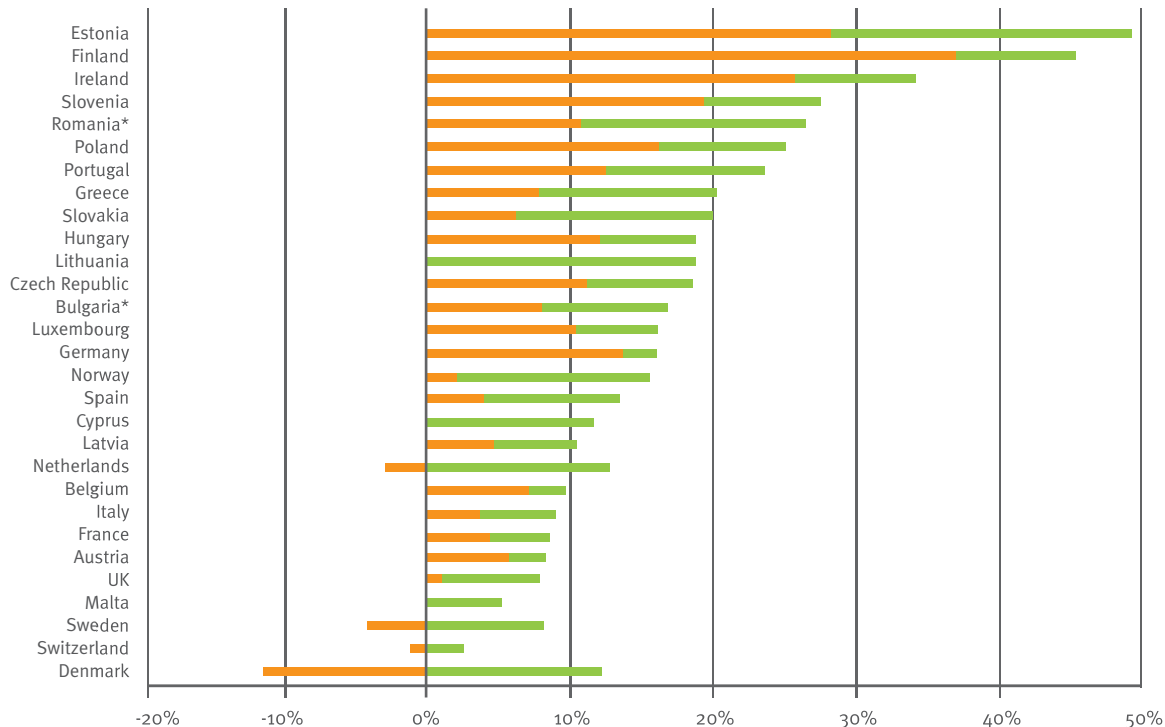
more citizens potentially supplied with energy recovered from plastics waste

41%

of plastics packaging was recycled in Germany in 2013 (based on input)

Plastics recycling and energy recovery complement each other

Changes in recycling and energy recovery rates by country



Source: Consultic

* For Bulgaria & Romania: comparison 2012 vs. 2007

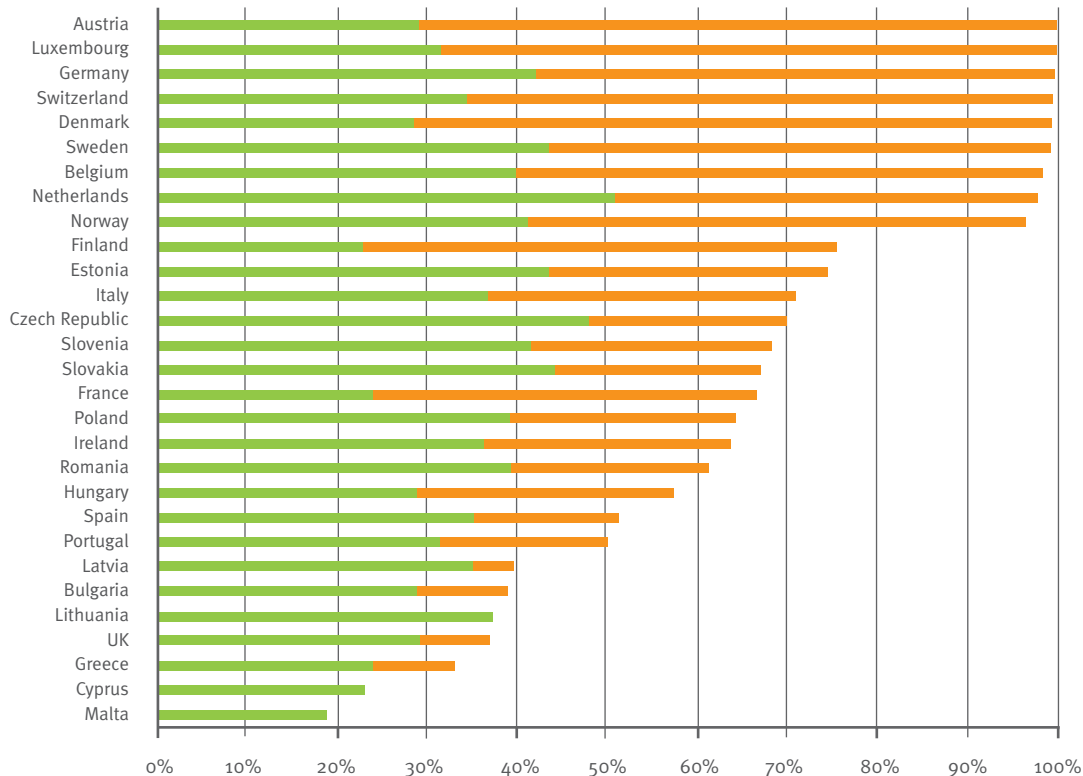
Comparison of rates 2012 vs. 2006

Referred to post-consumer plastics

● Energy recovery rate

● Recycling rate

Plastics packaging has the highest recycling and energy recovery rates



Packaging recycling and energy recovery rate by country 2012

(Referred to post-consumer plastics waste)

Source: Consultic

● Recycling rate
● Energy recovery rate

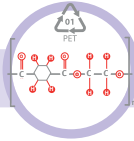
Life cycle of a plastic bottle: recycling options



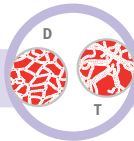
Crude oil components are separated through distillation. Plastic's major raw material is called **naphtha**.



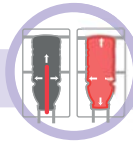
Smaller molecules result from naphtha cracking, i.e. **ethene, propene and butane**.



These short molecules (**monomers**) are particularly reactive, tie together and form long molecular chains (**polymers**).



The cross linking of the polymer chains determine their ductility: **Thermoplastic (T) – Duroplastic (D)**



Plastic pellets are heated into a viscous substance which is blown and stretched into a mould. The mould must be cooled to set the plastic in (a bottle shape).



PET bottle
Polyethylene Terephthalate is nowadays the major polyester type



Pre-selection of PET bottles



Optoelectronic colour separation



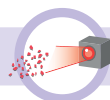
Thermoformed films



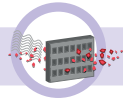
Extruder processes flakes into granules



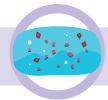
Automatic colour separation of flakes for further processing



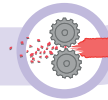
Optoelectronic colour selection



Material separation by density + drying process



Washing



Crushing into so-called flakes



Recycled PET is the raw material which is used to produce fleece pullovers



Fibres production

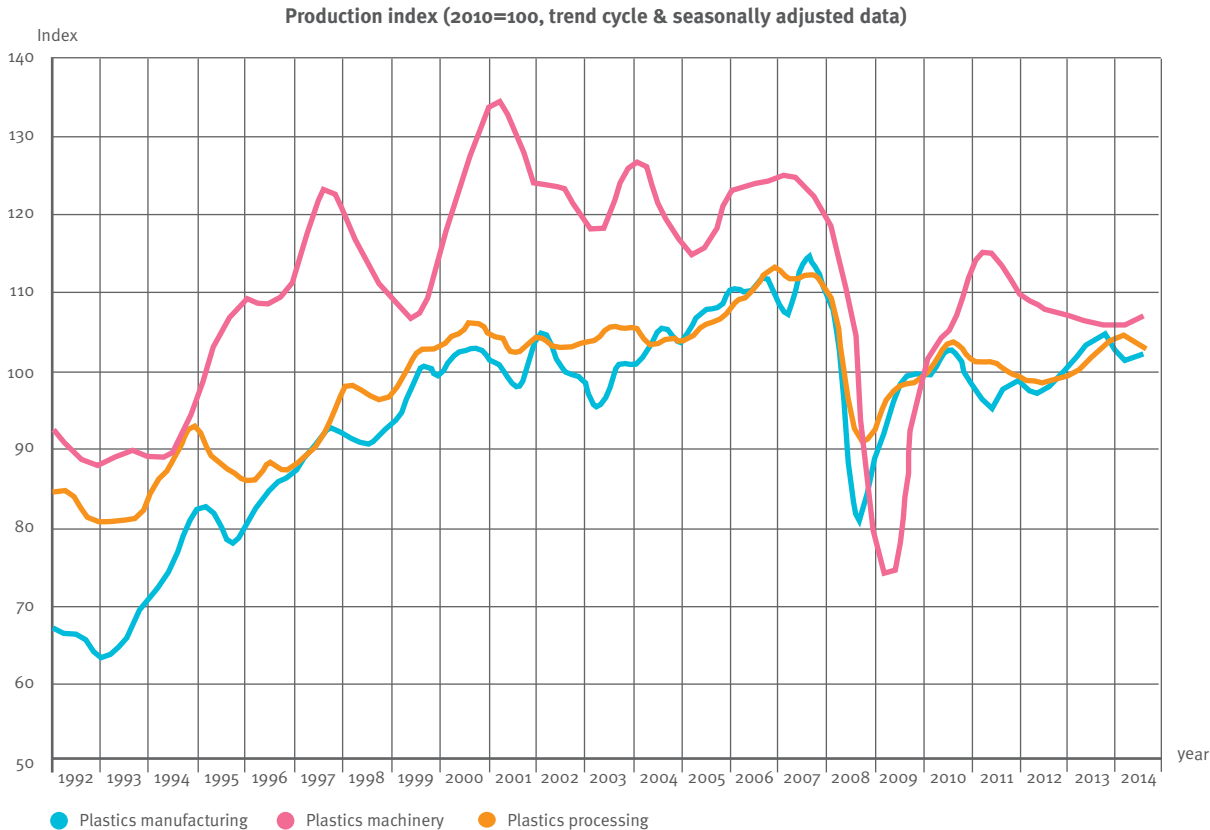


20% of the recycled material goes into the production of new bottles

Snapshot



In 2014 plastics production is still below pre-crisis level



Plastics industry production in EU-27

Source: Eurostat

Glossary of terms

ABS	Acrylonitrile butadiene styrene	PE-LD	Polyethylene, low density
ASA	Acrylonitrile Styrene Acrylate	PE-LLD	Polyethylene, linear low density
bn	billion	PE-MD	Polyethylene, medium density
CH	Switzerland	PEMRG	PlasticsEurope Market Research Group
CIS	Commonwealth of Independent States	PET	Polyethylene terephthalate
Consultic	Consultic Marketing & Industrieberatung GmbH	Plastics Materials	Thermoplastics + Polyurethanes (PUR)
ECEBD	Eastern and Central European Business Development	PUR	Polyurethane
EU	European Union	PMMA	Polymethyl methacrylate
EuPC	European Plastics Converters	PP	Polypropylene
EPRO	European Association of Plastics Recycling and Recovery Organisations	PS	Polystyrene
ETP	Engineering Thermoplastics	PS-E	Polystyrene, expandable
GDP	Gross domestic product	PTFE	Polytetrafluoroethylene
Mtonne	Million tonnes	PVC	Polyvinyl chloride
NAFTA	North American Free Trade Agreement	SAN	Styrene-acrylonitrile
NO	Norway	Thermo-plastics	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)
Other plastics	Thermosets, adhesives, coatings and sealants	Thermosets	Urea-formaldehyde foam, melamine resine, polyester resins, epoxy resins, etc
PA	Polyamide	UK	United Kingdom
PC	Polycarbonate	VCI	Verband der Chemischen Industrie e.V.
PE	Polyethylene		
PE-HD	Polyethylene, high density		

PlasticsEurope

PlasticsEurope is the association of plastics manufacturers and one of the leading European trade associations with centres in Brussels, Frankfurt, London, Madrid, Milan and Paris. It is 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.

European Plastics Converters (EuPC)

EuPC is the professional representative body of plastics converters in Europe. Its activities cover all sectors of the plastics converting industry, including recycling. Its main objective is to defend and promote the European plastics converting industries interests by:

- Voicing industry opinion to European and international institutions, and NGOs
- Maintaining relationships with corresponding European and global organisations
- Conducting surveys, studies and research projects covering all areas of the plastics processing industry

European Association of Plastics Recycling and Recovery Organisations (EPRO)

EPRO is the association of national organisations responsible for organising and promoting plastics recycling and recovery in Europe. EPRO provides a unique forum for leading European specialists in plastics waste management to exchange experience and ideas, develop integrated plastics packaging and agriculture waste strategies and support technological development.



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