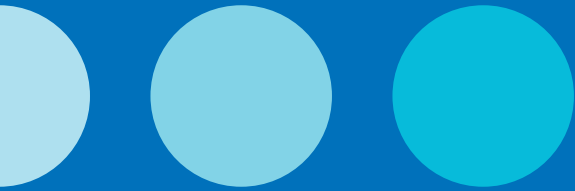




## Plastics - the Facts 2011

An analysis of European plastics production,  
demand and recovery for 2010



## Plastics are too valuable to throw away

Plastic is a unique material which allows for a broad range of products to be recycled and converted into new plastics, again and again. Let's not waste this opportunity!

# Table of contents

## 1. The facts about plastics

The plastics industry: a key building block of the European economy	Page	5
Plastics production	Page	6
Plastics applications	Page	7
Global imports and exports	Page	9
Plastics' value chain	Page	9
More plastics diverted from landfill	Page	10
Progress towards capturing the full value of used plastic	Page	11
Snapshot 2011	Page	13


## 2. Plastics driving innovation

Plastics securing food and water for a growing population	Page	15
Plastics to reduce tomorrow's cars weight	Page	16
Plastics for a cool and cosy home	Page	17
Plastics to serve and protect	Page	18
Plastics to enable smarter packaging	Page	19

## 3. Used plastics: too valuable to throw away

Waste management view	Page	21
A common European standard for recycling	Page	24
Agricultural plastics waste collection in Europe	Page	26
And the winner is... : Innovation Award for best-recycled product	Page	27

<b>Who we are</b>	Page	28
<b>Structure</b>	Page	29
<b>Glossary of terms</b>	Page	31



## 265 million tonnes of plastics produced

While producing 21.5% of the world's total volume of plastics material, the European plastics industry also provides jobs to 1.6 million Europeans.

Back on track to growth

# 1

## The facts about plastics

### The plastics industry: a key building block of the European economy

In 2010, the EU-27 plastics' industry has continued its recovery from the 2008 crisis. Plastic producers saw an increase in turnover of 17% to 104 billion euros, while the converting industry achieved a growth of 9.5% to 203 billion euros. Despite a decrease in employment from 2008 the plastic industry, including the plastics machine manufacturers, is providing jobs to about 1.6 million European citizens across Europe. In addition many more jobs depend on plastics, e.g. the sport equipment industry, the electrical appliances industry and the medical devices industry.

From 2009 to 2010 the global production of plastics increased by 15 million tonnes (6%) to 265 million tonnes, confirming the long term trend of plastics production growth of almost 5% per year over the past 20 years. In 2010 Europe accounted for 57 million tonnes (21.5%) of the global production and China overtook Europe as the biggest production region at 23.5%.

The plastics industry also plays an important role in enabling growth through innovation in a wide range of key European industries such as automotive, electrical & electronic, building & construction and food & beverage sectors.

Plastics are the true resource champions by saving more resources than they use, i.e. "more means less". For example substituting plastics with alternative materials would result in a 46% increase in energy consumption, a 46% increase in CO<sub>2</sub> emissions and generate 100 million tonnes more of waste every year across the EU.

The success story for plastics is expected to continue as its unique properties lend itself to more and more innovation applications. Whilst global demand per capita is expected to grow by 4% each year, consumption in Asia and new EU Member States is significantly below that of mature industrial regions where growth rates are expected to remain slightly above GDP. Thus there is room for further growth.

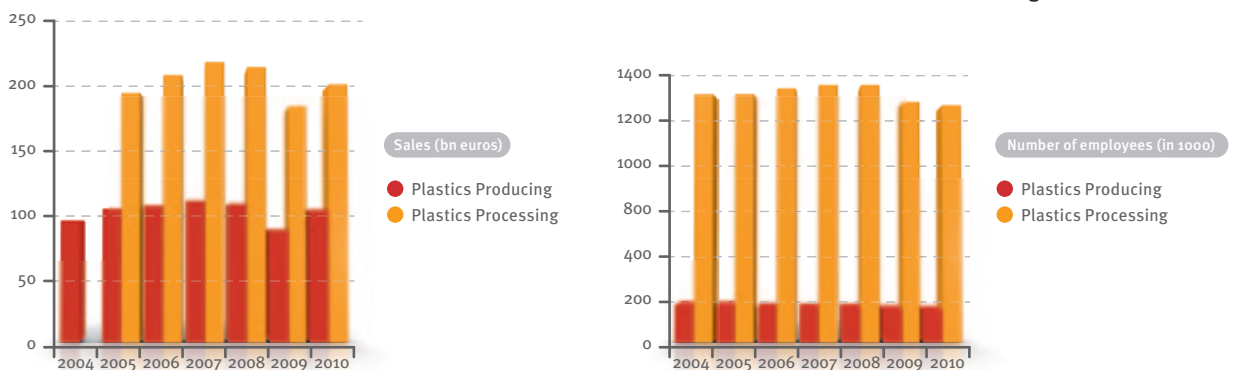


Figure 1: Development of Sales and Employment 2004 - 2010  
Source: EU Eurostat



# Plastics production

Plastics production in Mtonne:

Year	World Production (Mtonne)	European Production (Mtonne)
1950	1.7	0.35
1976	47	19.8
1989	99	27.4
2002	204	56.1
2009	250	55
2010	265	57

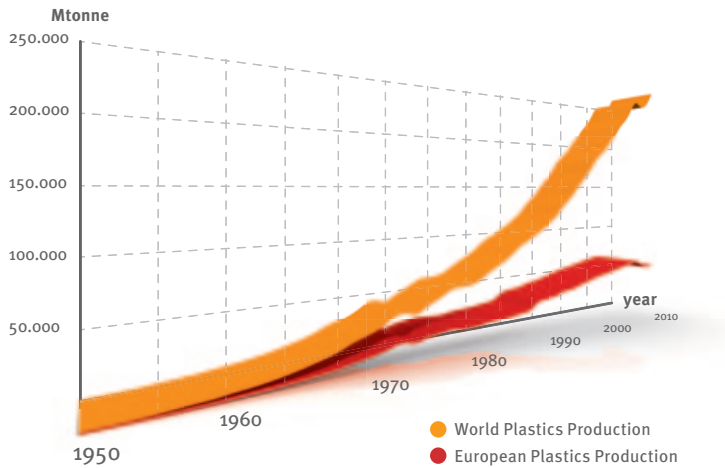


Figure 2: World Plastics Production 1950-2010  
Source: PlasticsEurope Market Research Group (PEMRG)

Europe (WE + CE) 21.5%,  
57 Mtonne<sup>(1)</sup>

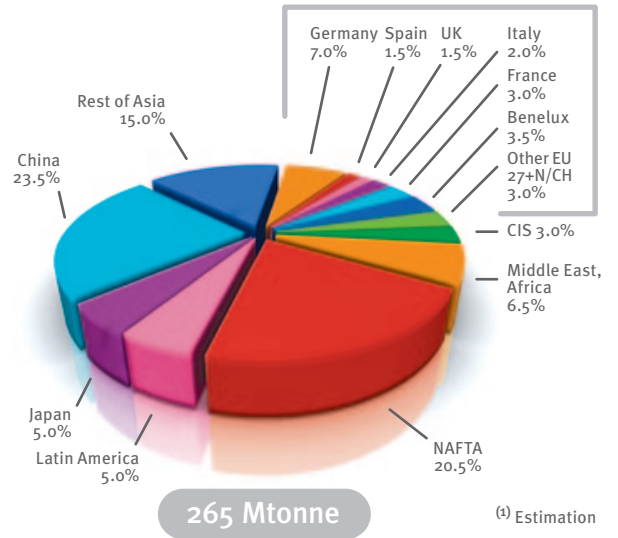


Figure 3: World Plastics Production 2010  
Source: PlasticsEurope Market Research Group (PEMRG)

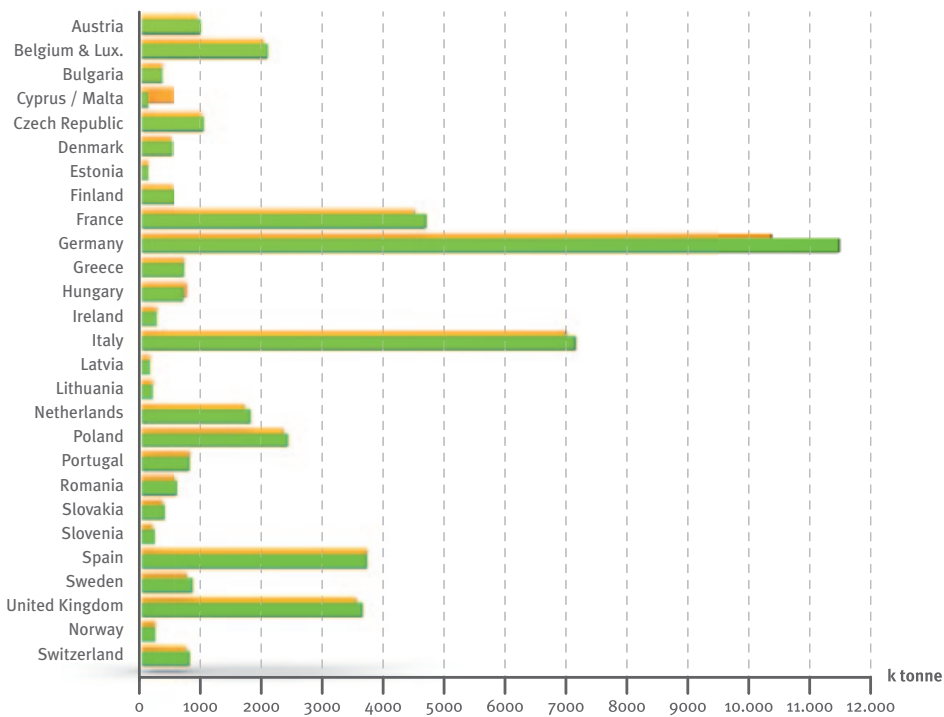


Figure 4: European Plastics Demand by Country (k tonne/year)  
Source: PlasticsEurope Market Research Group (PEMRG)

# Plastics applications

## Application sectors

Demand from European converters increased by 4.5% from 2009 to 46.4 million tonnes in 2010. The relative size of end-use applications remained fairly stable from previous years with packaging remaining the largest segment and representing 39% of the overall demand. However, this share is lower than the year before (40.1%) due to a higher growth of technical applications in 2010 over 2009.

The packaging sector is followed by building & construction (20.6%), automotive (7.5%) and electrical & electronic equipment (5.6%). Others include various sectors such as sport, health and safety, leisure, agriculture, machinery engineering, household appliances and furniture.

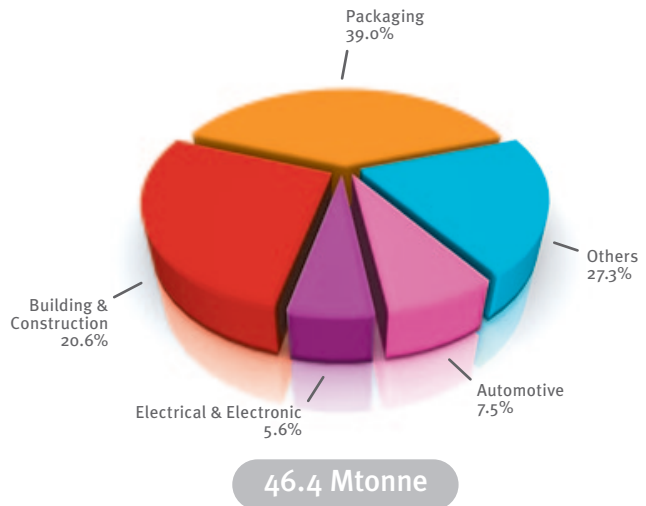


Figure 5: European Plastics Demand\* by Segment 2010

Source: PlasticsEurope Market Research Group (PEMRG)

\* EU27+N/CH incl. Other Plastics (~5.6 Mtonne)

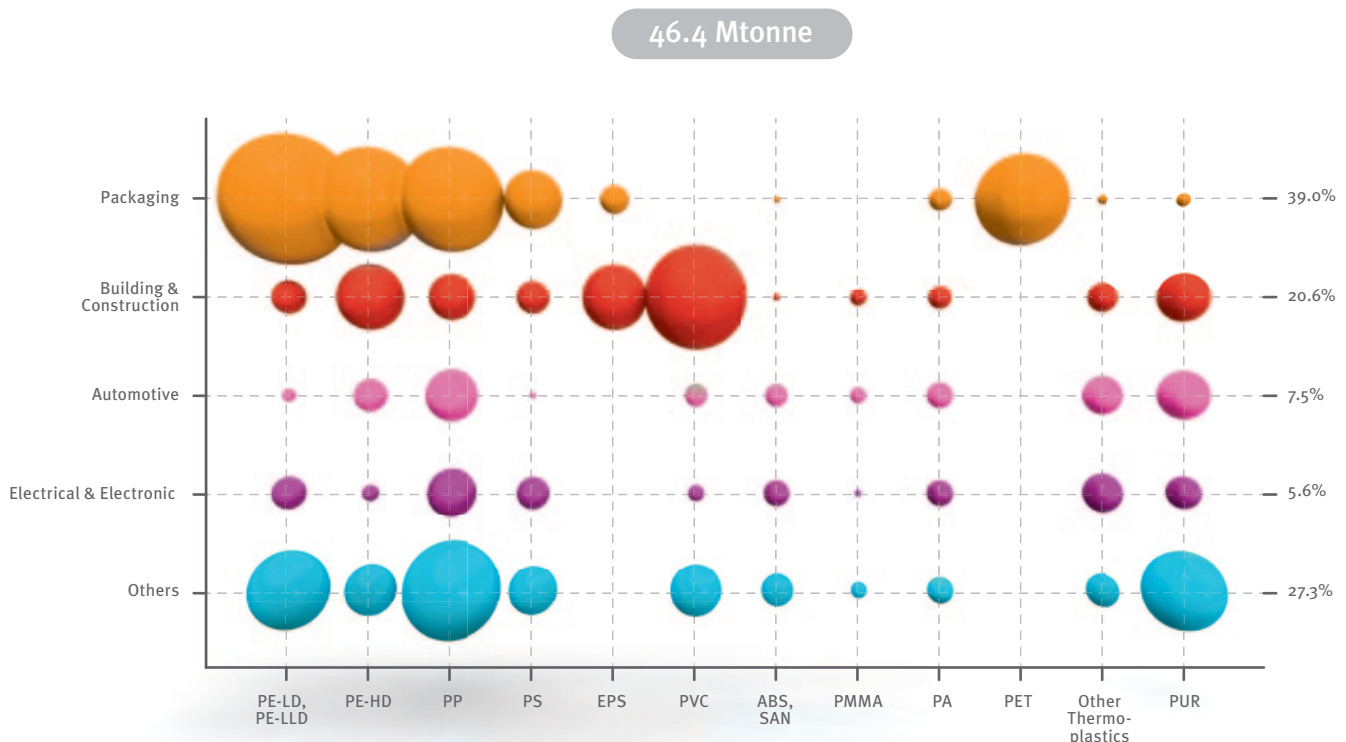


Figure 6: European Plastics Demand\* by Segment 2010

Source: PlasticsEurope Market Research Group (PEMRG)

\* EU27+N/CH incl. Other Plastics (~5.6 Mtonne)

## Types of plastics

There are different types of plastics with a variety of grades to help deliver specific properties for each application.

The “big five” plastic types that stand out in terms of their market share are:

- polyethylene – including low density (PE-LD), linear low density (PE-LLD) and high density (PE-HD)
- polypropylene (PP)
- polyvinyl chloride (PVC)
- polystyrene (solid PS and expandable PS)
- polyethylene terephthalate (PET)

Together these account for around 74% of the overall plastics demand in Europe. The top 3 resin types by market share are; polyethylene (29%), polypropylene (19%) and polyvinyl chloride (12%).

The growth of different plastic types varied in 2010. Engineering plastics showed the highest growth rate, e.g. acrylonitrile butadiene styrene (ABS) rose by 13% and polyamide by 20%, whereas demand for the “big five” increased between 1.4% and 8%. This growth in engineering plastics is driven by a combination of generic growth and bounce back from a drop caused by the economic crisis, which affected engineering plastics much more than the “big five”.

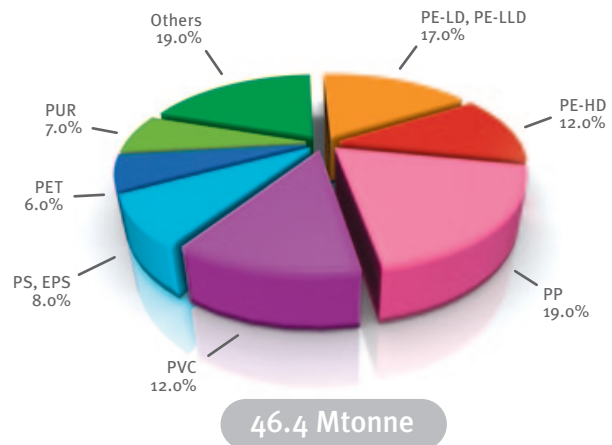


Figure 7: European Plastics Demand\* by Resin Type 2010

Source: PlasticsEurope Market Research Group (PEMRG)  
\* EU27+N/CH incl. Other Plastics (~5.6 Mtonne)

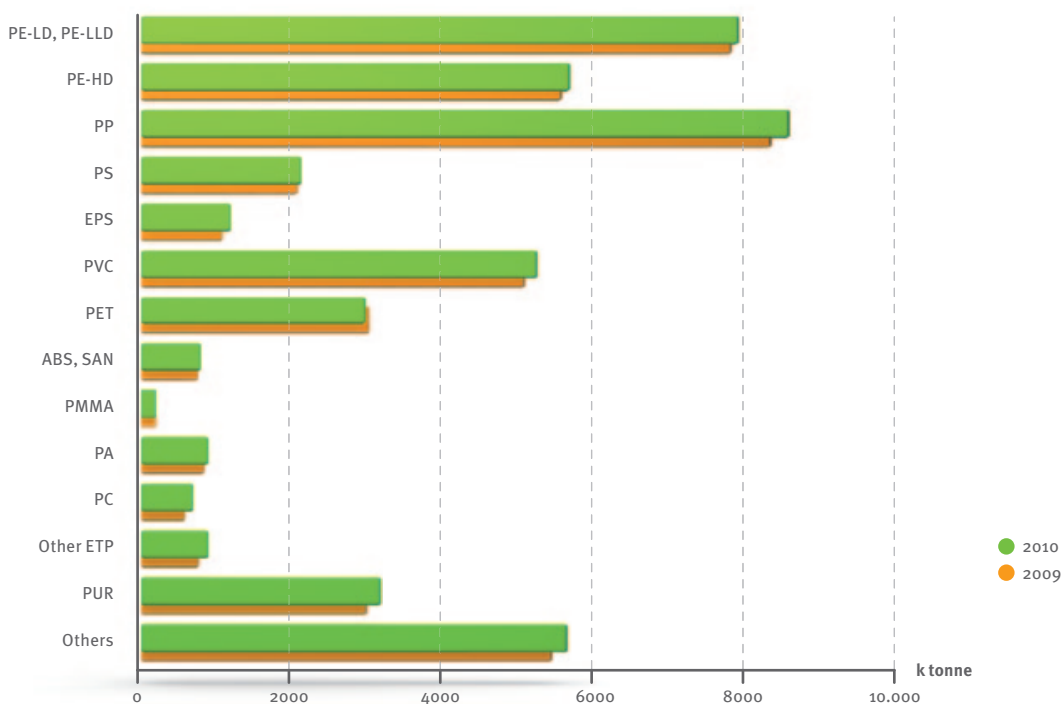


Figure 8: European Plastics Demand\* by Resin Type 2010

Source: PlasticsEurope Market Research Group (PEMRG)  
\* EU27+N/CH incl. Other Plastics (~5.6 Mtonne)



## Global imports and exports

The European Union has traditionally been an important net exporter of plastics and plastic products. This trade balance grew by over 100% between 2000 and 2010, reaching a total trade surplus of 15.7 billion euros in 2010. Despite a shrinking workforce and losing the number one production position to China the European plastics industry continues to be a key contributor to EU trade surplus.

The biggest export markets for plastics raw material remain China (incl. Hong Kong), Turkey, Russia and Switzerland.

EU exports (Extra EU) of converted products primarily went to the following countries: Switzerland, Russia and USA.

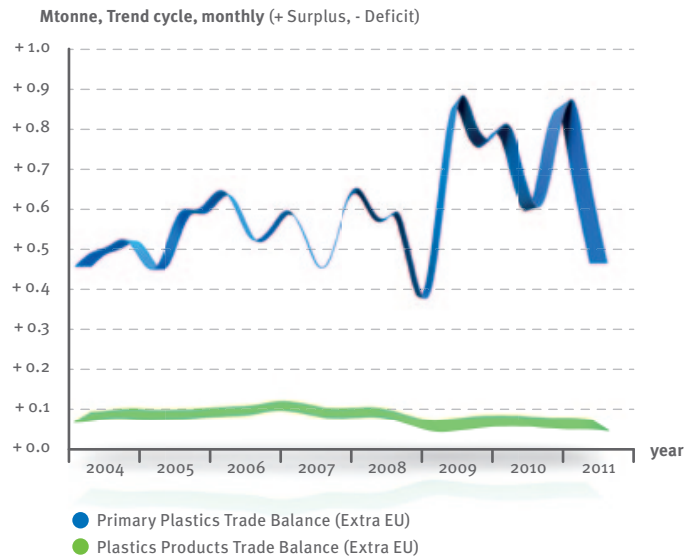


Figure 9: EU27 Plastics Industry: Trade Balance with Non-Member Countries  
Source: PlasticsEurope Market Research Group (PEMRG)

## Plastics' value chain

The diagram below (Figure 10) shows the main steps in plastics' lifecycle – from converter demand to disposal and recovery.

As mentioned earlier converter demand reached 46.4 million tonnes in 2010. However, given the numerous long-life applications, only slightly more than half (24.7 million tonnes) of the converted plastics end up in waste streams each year. In 2010, plastic waste levels rose by 2.5% from the year before, which is slightly lower than the increase in demand (+4.5%).

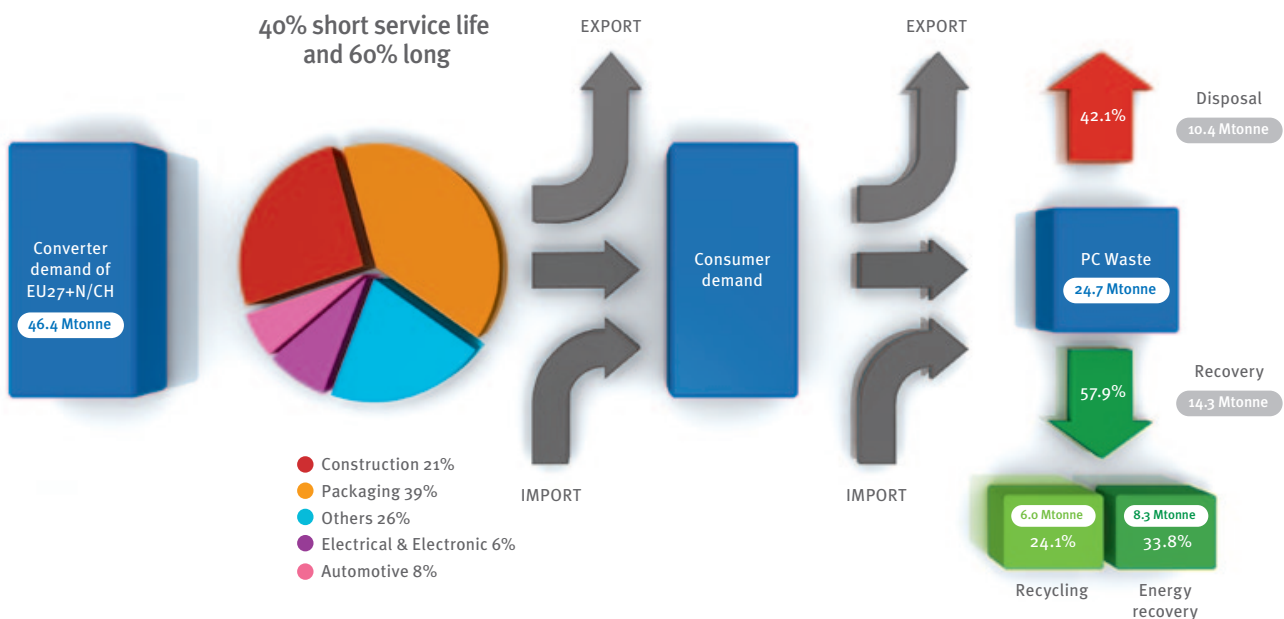


Figure 10: Recovery reached almost 58% in 2010 – and continues to increase (EU27+N/CH 2010)  
The 26% Others in Figure 10 refers to furniture, leisure, sport and medical applications.

## More plastics diverted from landfill

Thanks to continuous improvement in plastics end-of-life management options and a growing public awareness, the amount of plastics ending up in landfills is constantly decreasing despite an increase of 2.5% in post-consumer plastic waste in 2010.

- The total plastic production in Europe reached 57 million tonnes, up by almost 4% from 2009
- Demand from the converting/processing industry reached 46.4 million tonnes, increasing by 4.5% compared to 2009.
- Post-consumer waste reached 24.7 million tonnes, increasing by 2.5% from 2009 levels. Out of these, 10.4 million tonnes were disposed of and 14.3 million tonnes were recovered.
- The recycled quantity increased by 8.7% thanks to stronger activity from citizens, packaging collection schemes and recycling companies.
- The amount of plastics used in energy recovery increased by 9.8%, mainly due to increased use of post-consumer plastic waste as a complementary fuel in power plants and cement kilns.



Overall 9.3% more post-consumer plastics were recycled and used for energy recovery compared to 2009.

Figure 11 below shows the change in recycling and recovery rates between 2009 and 2010 in comparison with the average annual change over the years 2006 to 2010. Recycling and recovery rates rose more between 2009 and 2010 than the average change for 2006 - 2010. Landfill decreased somewhat less due to a growth in the total quantity of waste generated.

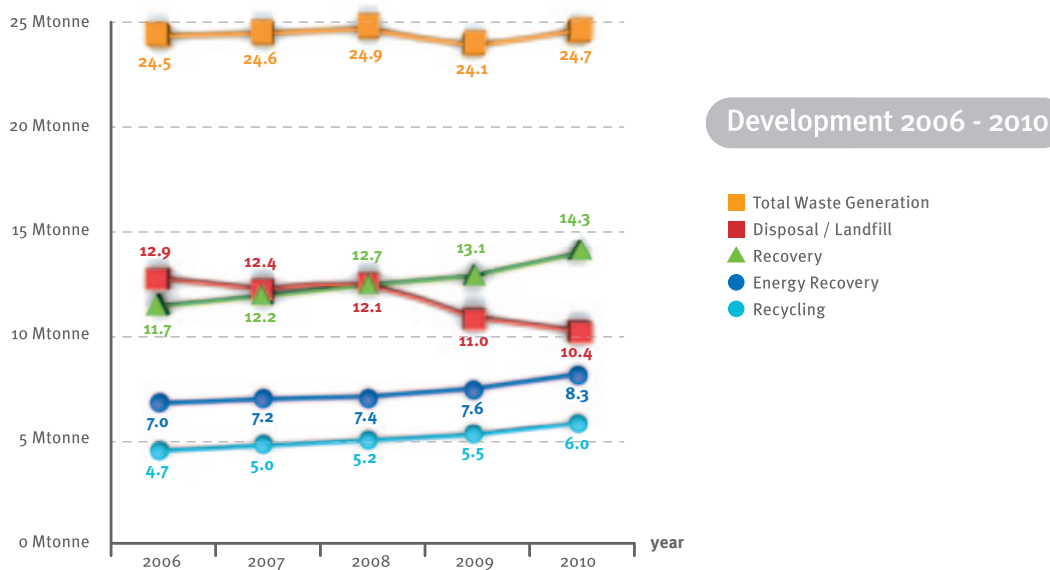


Figure 11: Total plastics waste recycling and recovery 2006 - 2010  
Source: Consultic

## Progress towards capturing the full value of used plastic

To capture the full value of plastics waste, it is necessary to combine different waste management options. Solutions vary from one country to another depending on the infrastructure, the national waste management strategy and the available technologies.

Part of the solution to plastics waste management lies in the acceptance by society that resources should be used efficiently and that plastics waste is considered as a valuable resource that should not be wasted in landfill. It is no coincidence that the top nine performing countries in Figure 12 all have tight restrictions on landfilling. If extended to the rest of Europe such restrictions will create strong drivers to increase recycling and recovery levels towards 100%.

Any strategy aiming for improving waste management should combine both recycling and energy recovery. Plastic waste products which are not suitable for recycling, due to environmental and economic reasons, should be used as a complementary fuel in order to recover their embedded energy.

Figure 12 below shows that whilst recycling performance ranges mostly between 15 to 30% in most countries, energy recovery levels vary between 0 and 75%. Countries which currently landfill valuable end-of-life material have an opportunity to reduce their climate footprint, address their energy deficit and use resources more efficiently through quickly expanding their energy-from-waste and recycling networks.

Overall slow progress has been achieved in capturing the value from plastics waste. The increase in recycling and recovery rate is approximately 5% per year. Many EU member states need to pursue greater efforts in order to divert their plastics from landfills by 2020.

In Figure 13 (next page) we can see how the increase in recycling and energy recovery rate between 2006 and 2010 varies between EU Member States. The biggest improvement in recovery rate has been achieved in Estonia with 29%, followed by Finland at 27%. A number of countries have increased their recovery around 15%: Hungary, Slovakia, Germany, Czech Republic, Norway and Lithuania.

Denmark, Switzerland, Malta, France and Sweden have improved their recovery rate by less than 5% but with a change from energy recovery to recycling in Denmark, Sweden and Switzerland where even in 2006 little plastics went to landfill.

Recycling and recovery rates for plastics packaging is higher, 66% compared to 58% for all plastics, reflecting the focused efforts over a longer period to develop recycling and recovery options.

Recycling and energy recovery rates are similar for packaging (32 vs 33%) whilst energy recovery plays a bigger role for all plastics (24 vs 34%). (See Figure 14, next page)

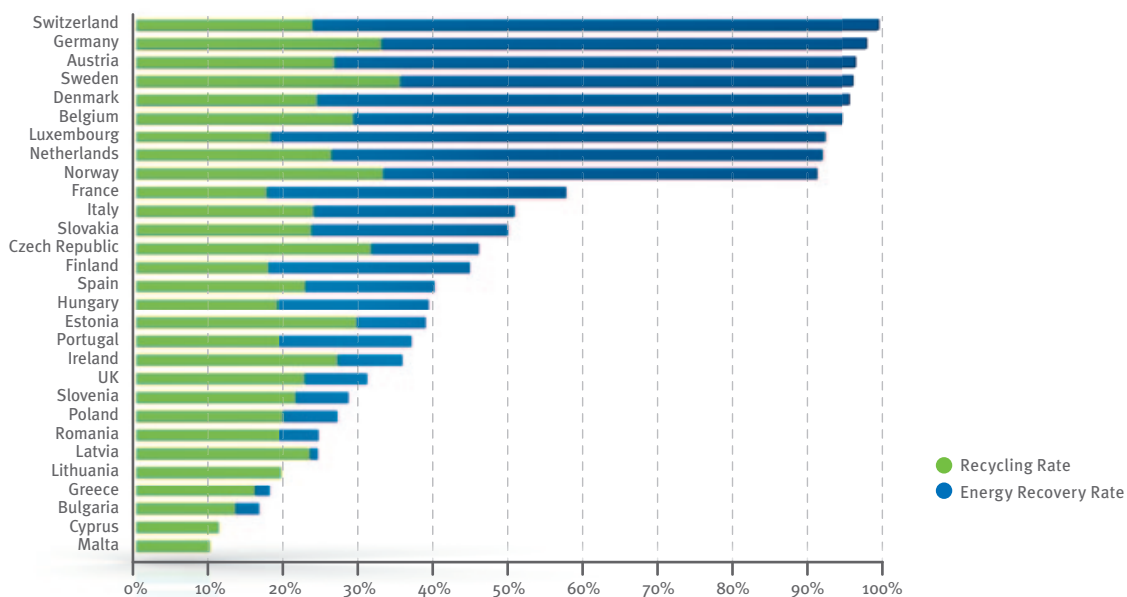


Figure 12: Total Recovery Rate by Country 2010  
(Referred to Post-Consumer Plastic Waste)  
Source: Consultic

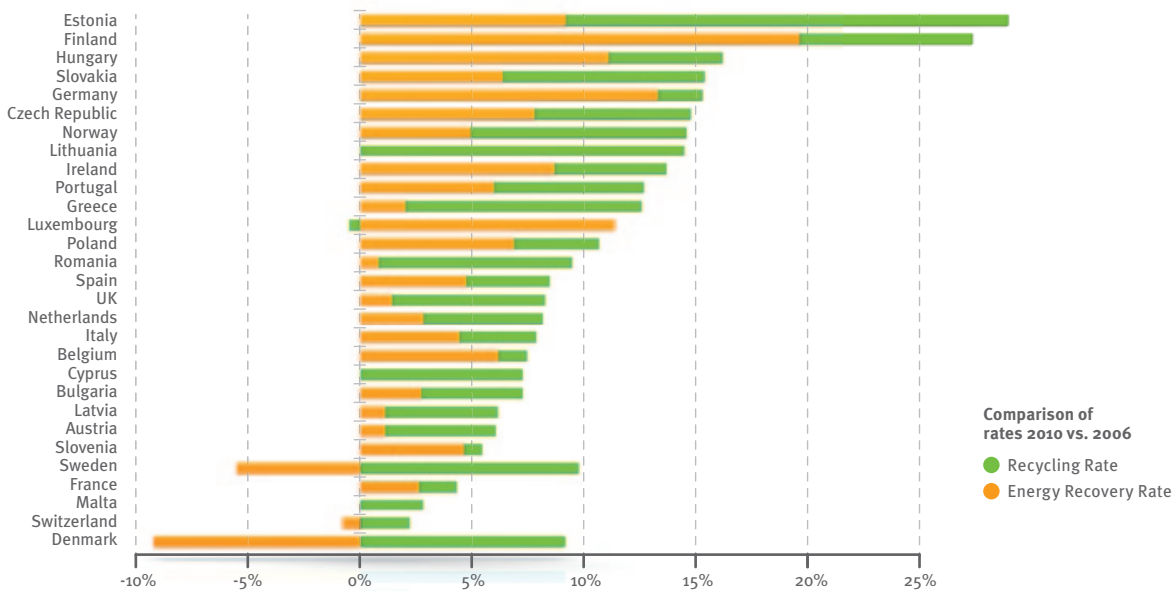
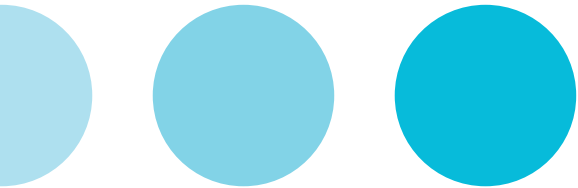


Figure 13: Change in Total Recovery Rate by Country 2006 - 2010  
 (Referred to Post-Consumer Plastic Waste)  
 Source: Consultic

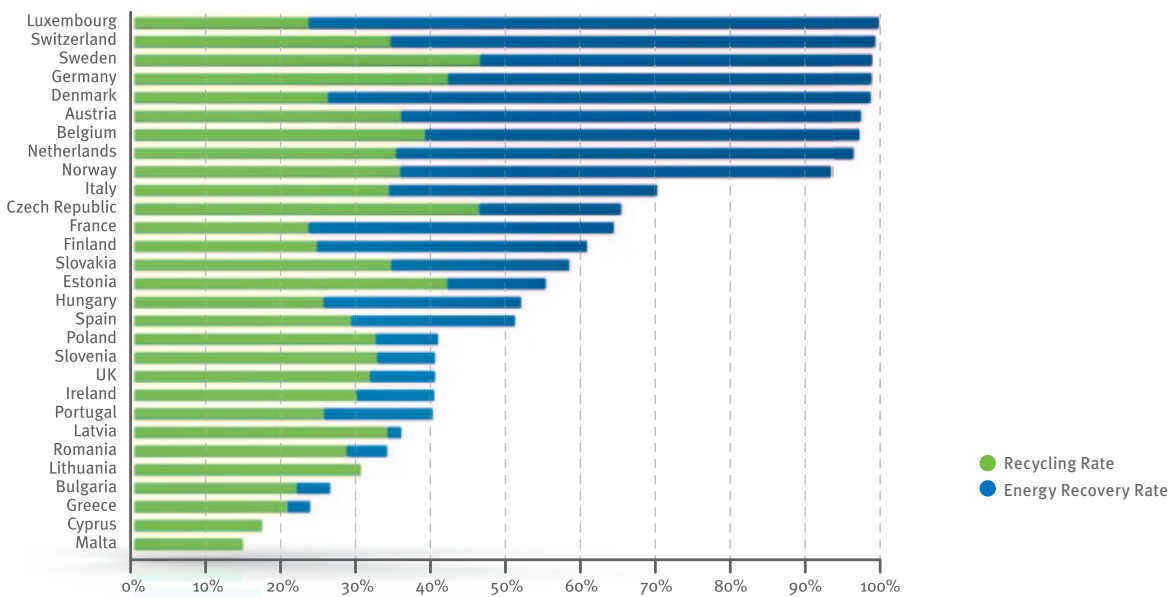


Figure 14: Total Recovery Rate by Country 2010  
 (Referred to Post-Consumer Packaging Plastic Waste)  
 Source: Consultic

## Snapshot 2011

The European plastics industry continued its recovery in 2011 after the economic recession – especially for manufactured plastic products. The pace of recovery has slowed down after the spring due the reduction of inventory and uncertainty over the economic development

The pace of recovery has been uneven across plastic industry sectors since the second half of 2010. Production of plastics and plastics products grew until the beginning of 2011, but has slowed down since March 2011. On the other hand, demand for plastics machinery continues to grow in 2011.

The upward trend in plastics consumption in the electrical machinery industry and automotive sector continues. After months of decreasing demand for plastics in the construction industry in 2010, growth resumed at the beginning of 2011 and has now levelled out. Demand from the more stable food and beverages sector remained on a constant level.

Export of plastics has increased since the second half of 2010 and has reached its peak at the end of 2010. Latest figures for plastics products show stabilising export quantities and increasing import quantities, hence the trade surplus is expected to decrease from 2010. Also recycled material is increasingly exported to the extent that European recyclers struggle to find feedstock.

After the strong growth in demand for both plastics and plastics products in the beginning of 2011, we now see signs of a reversing trend. Given the very uncertain economic outlook the situation for the rest of 2011 is very difficult to forecast.

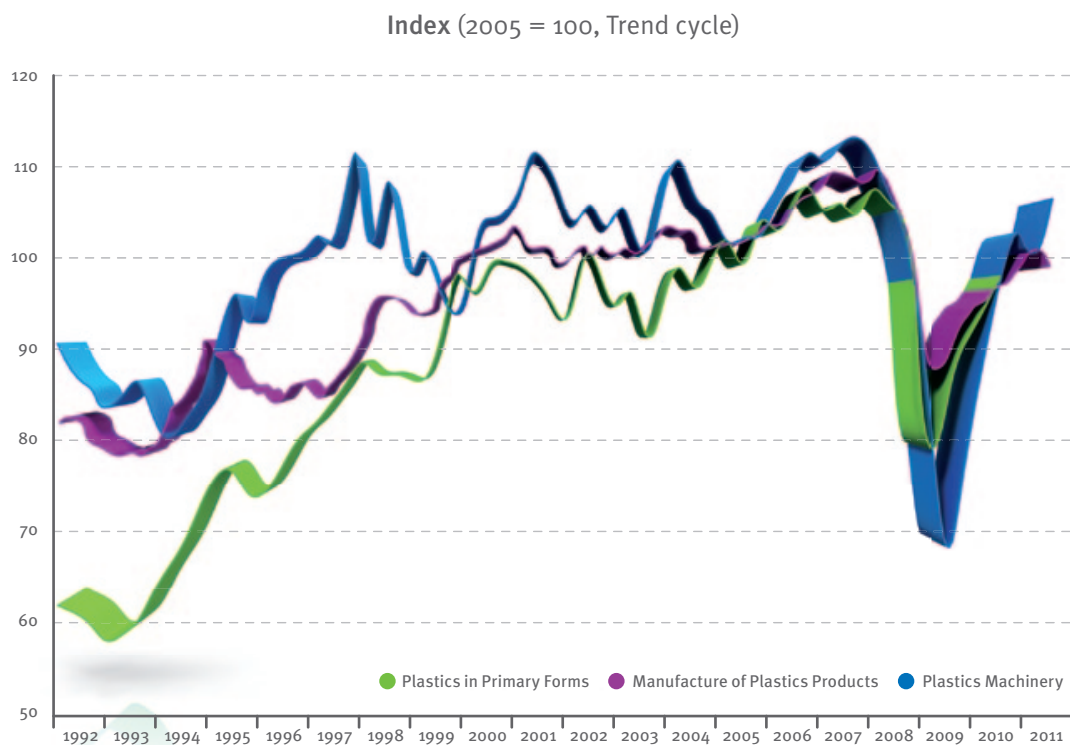


Figure 15: Plastics industry production in EU27

Source: Eurostat / PlasticsEurope Market Research Group (PEMRG)





## At the forefront of innovation

From food packaging to construction and electronics, plastics are often associated to the most innovative products. They will certainly play a key role in taking on the main challenges faced by our society.



## When plastics meet architecture: towards zero-energy buildings



# 2

## Plastics driving innovation

The plastics industry is continuously innovating to respond better and more efficiently to our daily needs. Prevention is one aspect of plastics' high performance whereby they preserve resources through:

- using less plastics in existing applications.  
A plastic bottle uses only a third of the material it did 40 years ago.
- substituting other materials in new applications.  
A plastic wine bottle weighs only 10% compared to the weight of an alternative material.
- decreasing the weight of vehicles results in fuel savings.
- preventing food waste with smart plastics packaging. The carbon footprint of meat is more than 100 times the carbon impact of the packaging that protects it and extends its shelf-life.
- enabling renewable resources being it wind power or photovoltaic panels.

## Plastics securing food and water for a growing population

**In 2010, about 1 billion people suffered from malnutrition, mostly in developing countries. The world population is expected to undergo a substantial growth, reaching over 9 billion people in 2050. Providing an acceptable standard of living to all will require both new technologies and a more resource-efficient life style. Plastics can contribute in a number of ways to meet this challenge.**

Using plastics in agriculture to improve growing conditions, can triple crop yields. Greenhouses with climate control, for instance, allow a production of 33kg/m<sup>2</sup> of tomatoes where crops in open air would barely yield 9kg/m<sup>2</sup>. Plastic tunnels enable food production and multiple harvests to be achieved in environments that may otherwise be considered as too dry, cold or infertile, while nutrients contained in plastic bags or containers can help grow crops hydroponically where no soil is available. These crops can also be protected from floods, thanks to securely moored plastic greenhouses - currently being developed in The Netherlands – that can float when water levels rise.

By 2025, two billion people will live in countries or regions with absolute water scarcity. Plastic pipelines can transport water, virtually leak free, over long distance as well cater for small diameter distribution networks. Plastic pipes used in computerised irrigation systems help farmers avoid wasting significant quantities of water. Plastic drippers mounted in plastic pipes can provide tailored irrigation under all topographical conditions preventing water loss and resisting damage. Finally, when the scarcity of fresh water becomes critical, plastics can enable desalination technologies and the “plastic super grids” for long distance water pipes will secure hygienic and leak free distribution of water.

## Plastics to reduce tomorrow's cars weight

**The automotive industry is undergoing a significant change and plastics play an increasingly critical role in the development of low emission and zero-emission cars of the future. Weight is a decisive criterion in vehicles design: the lighter the better. As such, the course is set for “slimming down” electric vehicles.**

Car makers expect that a 5% weight reduction can result in average fuel saving of 3%. This is critical as electric vehicles of the future will depend on electricity stored in heavy batteries.

Plastics can make a substantial contribution by offsetting this extra weight. Vehicles where the passenger cell is built of light-weight but very strong carbon fibre reinforced plastics and side panels from plastics will soon be on the market. In combination with other materials, plastics can reduce the weight of car parts by up to 70% when compared with conventional material components.

Moreover, innovative technology makes it possible to use plastics and metals together, thus combining the advantages of both materials. It is also worth noting that an increasing amount of bodywork parts are bonded instead of welded, which further reduces weight and improves stability and strength. Bonded front and rear windshields enable the construction of increasingly aerodynamic vehicles.

Plastic glazing for side and rear windows as well as panoramic roofs are becoming more and more popular. Substituting alternative materials with plastics for such applications can lead to a massive 40% reduction of the weight of these parts.

Plastics also give designers freedom which alternative materials do not provide. Today plastics make up 12 to 15% of modern cars. This is expected to ultimately increase to more than 20% in the future.

Finally, plastics in cars also mean more protection and safety for the driver, passengers and pedestrians. Thanks to plastics, our cars are equipped with safety belts, airbags, protective panels, etc.

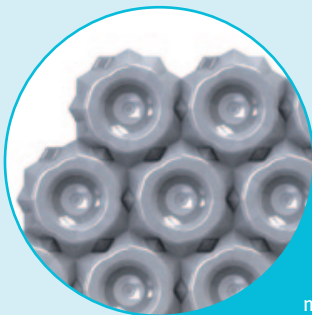


In collaboration with Faurecia and Performance Materials Corporation (PMC), BASF has developed a car seat back based on new plastics technology.

The back weighs 20% less than that of a conventional car seat and is about 30 mm thinner, an important advantage when it comes to making vehicles lighter.

## Plastics for a cool and cosy home

By 2020, the European Commission aims to have all new buildings designed to achieve a zero energy consumption level. While this is a very good start, it will not be sufficient as existing buildings also need to be considered in order to reach the targets set by the EU on energy savings and GHGs emissions.



POLLI-Brick™ is a revolutionary building material entirely made of recycled plastics. It combines strength with unmatched cost-efficiency and the lowest carbon footprint. It can be customised at will by designers.



© MINIWIZ, [www.miniwiz.com](http://www.miniwiz.com)

Plastics can contribute in achieving both objectives by making a substantial difference not only in new buildings but equally in the refurbishment of old ones to help drastically reduce their energy consumption by the following:

- **Thermal insulation.** Over its lifetime plastics building insulation delivers energy savings of 150 times the energy needed for its production. Only 70 litres of oil are needed to produce one cubic metre of plastic for roof insulation. Yet this one cubic metre will save approximately 5,500 litres of heating oil in just 50 years, while sparing the atmosphere some 19,000 kg of carbon dioxide and other pollutants. Apart from its energy-saving properties, insulation also promotes comfort and health – by improving noise insulation, for example. Insulation is often associated with reducing the heating bill but is equally important in summer and in warmer countries where it reduces the energy consumption by eliminating or reducing the need for air conditioning.
- **Heating and cooling systems.** These systems allow sophisticated regulation of the temperature inside a building, reducing energy consumption and emissions. There are many different types of systems, such as controlled ventilation systems with thermal recovery, or a thermal radiation system that can be integrated into the windows. Even under extremely cold weather conditions inhabitants still enjoy cosy warmth. These systems achieve a comfortable interior temperature faster and with less energy than conventional heating systems. These sorts of system mean that radiators are no longer necessary for heating.
- The combination of these measures with additional methods such as **triple-glazed windows** enable fuel consumption and CO<sub>2</sub> emissions to be reduced by up to 80% compared to a building that does not use these techniques.

Did you know that plastics save lives?  
Already present in most medical products and machines, plastics have unique features that help make giant strides every day.

## Plastics to serve and protect

**Modern healthcare would simply be impossible without plastics. From syringes to the most high-tech machinery, plastics play a crucial role in improving people's health and saving lives.**

According to the World Health Organization, an estimated one million people in Africa die of malaria each year – mostly children. That is one death every 45 seconds. In this instance, plastics provide a simple and affordable solution: plastic nets treated with insecticides will ward off malaria-carrying mosquitoes and save countless lives.

Plastics are robust, versatile and easy to clean and to sterilise. They also form an unequalled barrier to liquids, gases and pollutants. In 2010, many findings confirmed this innovating trend and contributed to further place plastics at the top of the list of materials when it comes to innovative and groundbreaking applications. One of the major concerns of the last couple of years, hospital acquired infections, can now be partially prevented thanks to innovative plastics with antimicrobial properties being used to produce tubing, blood transfusion bags, needles or hospital durables as well as workplace surfaces that in the past would have harboured sources of potential infection. Plastics can also preserve the effectiveness of the most effective drugs, thanks to specific polymers with excellent barrier properties.

According to recent researches, plastics can copy the most complex structures and features of biological cells. In the future, coaxed polymers rolled up in double helices could lead to synthetic structures behaving like proteins. These could be used as vehicles to deliver drugs to the organism and specifically target a disease. Likewise, synthetic blood cells similar to red-blood cells could one day be able to circulate in human organisms for long periods, delivering the most effective cancer-fighting medicine to the patient or act as emergency transfusions without the need for blood typing before being eliminated naturally by the organism.



## Plastics to enable smarter packaging

**Effective packaging to preserve and protect food from waste is absolutely crucial not only to avoid food loss but also to reduce CO<sub>2</sub> emissions. Innovative plastics packaging help protect food in transport from farm to supermarket and innovative packaging extend shelf life and reduce food losses both in the store and in our fridges.**

In developing countries, some 50% of the food is wasted from farm to store. This is reduced in developed countries to 2-3% through a combination of transport and packaging solutions. Still a third of all food we bring home in countries like the UK and Italy is wasted. Here is still potential to improve and innovative plastics packaging can help reduce this waste further.

Intelligent plastic packaging is developing some fantastic solutions in this respect. For instance, nitrogen barrier plastic packaging keeps meat out of contact with oxygen, prolonging the shelf life by two weeks. With the integration of Radio Frequency Identification (RFID) chips into conductive polymers packaging, consumers will be provided with precious information on the quality and status of their products. Intelligent packaging will include an array of freshness indicators and electronic chips to improve performance, reduce wastage and thereby cut CO<sub>2</sub>.

Packaging has been an area with high degree of innovation and this continues, with lots of new, innovative packaging being developed and presenting numerous advantages. Examples are anti-counterfeiting, anti-tampering, childproof closures, track and trace functions which are the most used at the moment. Another example is printed resistive loops on packaging detecting damage or the physical condition of fragile products which can be assessed without opening their packaging.

Smart packaging will also improve recycling rates. Efforts have already been made to develop packaging that is fully recyclable or recoverable. In order to help consumers act responsibly and dispose of their packaging in the most appropriate way, an RFID chip could be incorporated in the packaging to help sorting the packaging at home and in industrial sorting.


Thanks to printable RFIDs, the food packaging of tomorrow will provide consumers with valuable information on the condition of packed products.





## Capturing the value of plastics waste

Littering plastics is a waste of resources. While some European countries achieve a recovery rate above 90%, many still lag behind and there is much room for improvement as new technologies emerge.



**Automotive:**  
More plastics means greener cars



# 3

## Used plastics: too valuable to throw away

### Waste management view

#### Plastics are resource-efficient in their use phase

Thanks to plastics, fewer resources are required to satisfy our daily needs. Fewer valuable goods are wasted when protected by plastic packaging, improvements in crops' productivity are made possible and renewable energy solutions are unveiled. Plastic products can also contribute to sustainable development after their use phase if they are disposed of responsibly and processed for recycling and recovery.

All plastics are recyclable – mechanically or chemically - but not all plastics are beneficial to recycle from an environmental and economic perspective. Such plastics can instead become an important energy source for power and heating.

#### No plastics shall be wasted on landfills

Landfilling used plastics reinforces the perception that plastics have little to no value and can lead to litter on land that may ultimately end up in the marine environment.

The plastics industry is committed to diverting all plastics from landfill and will advocate for plastics to either be recycled or used as fuel in efficient energy recovery plants. The comparison between EU Member States is enlightening: wherever legal measures are put in place, e.g. UK's landfill tax or Germany's ban on landfilling combustible waste, then recycling and recovery rates rise.

Without such drivers waste owners will continue using the cheapest option and will unlikely pay more for recycling and recovery. Furthermore, such legal measures stimulate investment in state-of-the-art collection, sorting and recycling infrastructure as well as innovations which improve efficiency and create green jobs across Europe.

The plastics industry unites behind a policy for a 100% plastics recycling and recovery rate supported by legal and financial restrictions on landfill.

#### Extend collection to all plastics for recycling and recovery

Plastics are visible in the marine environment and on landfills. Hence there is an urgent need to collect all used plastics. Citizens often associate separate collection of plastic bottles as recycling, whilst they leave other plastics products in the residual waste bin. These practices cement the image that many plastics products are not recyclable – which is not true.

The first action to undertake if we want to divert all plastics from landfill is to collect all post-consumer plastics. Collecting more than the bottles in the household stream requires an efficient infrastructure capable of separating the different types of plastics. Without such capability, there is a risk that the additional collection will severely damage the value of what is already recycled.

Our view is that collection of used plastics should be significantly enhanced, but the roll-out of such enhanced collection can only take place when the appropriate infrastructure exists.

Rapid technological development in sorting processes over the course of the past decade makes this goal realistic. Today plastic particles down to a few millimeters can be identified from mixed input stream and sorted for reprocessing.

### Drive quality focus into the recycling of used plastics

Recycling is often perceived as the most important contribution citizens can make to sustainable development. Political messages such as “Recycling Society” have strongly contributed to this perception.

It all starts with appropriately designed products. Once the functional needs are safeguarded the designer should factor in sustainability through material selection, manufacturing methods, reuse and recyclability. Design guidelines such as those recently updated by the European PET Bottle Platform or the “Plastics Packaging - Recyclability by Design” guide commissioned by RECOUP are essential to support a focus on quality at the end of life phase.

Sorting, reprocessing and marketing recycled materials back into applications as a complement to virgin plastics require a quality approach throughout the recycling operation and includes HSE, quality system and market knowledge.

The European recycling value chain must continue to drive a quality focus so their products can complement virgin plastics and other materials.

Global trade in plastics waste would still be a necessary complement to maximise the recycling opportunities. However, such overseas facilities must meet defined quality standards as well. The European Commission will take a holistic look at global trade as part of the 2020 Raw Material Policy.

### Support for efficient energy recovery

Whilst all plastics are technically recyclable – mechanically or as feedstock –, not all plastics products are beneficial to recycle when environmental and economic factors are measured up. Striking the right balance between these two complementary options, using science-based facts is important to divert plastics from landfill. All well as not all plastics are beneficial to recycle it is equally important to avoid that recyclable materials are used as fuel.

After the full potential for recycling has been explored, we are left with a remaining, valuable fraction of plastics material which holds a significant value as an energy source.

Achieving societal acceptance for energy recovery as a complement to recycling will be challenging as the current public perception of energy recovery is poor and in many cases based on outdated facts. This therefore often results in strong opposition to plans for building new capacity (NIMBY attitude). Unfortunately little of today’s benefits for energy recovery are outlined in the public debate. This is something supportive stakeholders will have to address together.

Efficient energy recovery solutions include combusting in “combined heat and power” technologies where the energy in the waste, including plastics, is converted into both power and heat. Alternatively waste plastics can be converted into a specified fuel (Solid Recovered Fuel – SRF) which can be used in a number of combustion plants, including cement production.

The plastics industry will support efficient energy recovery as a complement to recycling to divert plastics from landfill.







## A common European standard for recycling

The European market for plastics waste is constantly growing, with plastics waste generation reaching 24.7 million tonnes in 2010. Although 58% of this waste has been recovered, more effort is needed in order to fully capture the potential laying in plastics waste. An action at the European level is needed to structure the post-consumer plastic waste industry, especially as there is currently no existing standard to evaluate the quality of post-consumer plastics in recyclates.

EuCertPlast is a three-year project (co-managed by EuPR and EPRO) aiming at creating a European Certification for post-consumer plastics recyclers who are recognised for operating in compliance with high quality standards. Such a certification will increase customers' confidence that any recycled product they get has been recycled according to the best existing practices, respectful for the environment and complying within national legislation.

This project, which began in September 2009 and will end in August 2012, is funded by the European Commission under the Eco-Innovation Programme. The Certification will be delivered to each Recycling Process operating at a site and will cover the following areas:

- Operating and environmental permits required for the country of operation
- Staff training, qualifications and organisation
- Incoming material procedures and controls
- Stock management
- The Recycling Process and associated mass balance calculation
- Controls on Recycled Outputs
- Environmental protection
- Subcontracting
- Quality Management and traceability



© Melissa  
Melissa + Jean Paul Gauthier



© Melissa  
Melissa + Zaha Hadid

Did you think recycled plastics were not trendy? Then think again. Becoming more and more environmentally aware, the fashion sector is increasingly looking at plastics when developing new products such as shoes, handbags or clothes.







## Agricultural plastics waste collection in Europe

In the agricultural sector plastics help improve production efficiency and reduce water, pesticides and fertilisers consumption. Plastics can be found in mulch, silage, greenhouses, tunnels, floating covers, piping and packaging applications and contribute to an eco-efficient and sustainable production.

Agricultural plastics represent 5% of the total plastics production and slightly more of total plastic waste. Films represent 60% of the consumption in the sector so it is not surprising that LDPE is the most used polymer.

### Recycling and recovery of agricultural plastics:

There is no common European legislation on the recovery of agricultural plastics apart from pesticides, fertilisers or seed packaging which reach a recovery rate of over 60% in countries from Eastern and Western Europe. Systems in place are mostly co-operation between the pesticide industry, the wholesalers and waste management organisations.

All in all the European recovery rate for agricultural plastics is only 49.5% and even though more than 35 recycling companies have opened capacities for agricultural plastics the mechanical recycling rate is around 23%.

The difference in recovery and recycling rates between European countries is huge. Some such as Ireland, Iceland and Spain have specific legislations. Plastic film producers in France, Norway or Sweden have developed very efficient voluntary agreements and, in parallel, similar schemes are being developed in Spain, the UK, Belgium and Germany. In other European countries, initiatives are either financed by farmers or no systems are in place.

The countries which have recycling systems in place for agricultural plastics have a much higher recycling rate than those which do not.

### EPRO Working Group

In order to achieve a qualitative exchange of information and to share best practices between the agricultural plastics producers and recovery and recycling industry, EPRO launched a working group on agricultural plastics in March 2011 whose main goal is to increase the efficiency and effectiveness of the existing systems to increase recycling. Furthermore, the platform provides a pool of expertise for countries that are willing to build up new systems for the sector.



### Plastics Converters Actions

The plastics converters – lead by EuPC and EuPF with support on operational level from APE Europe – are working together with various actors of the agriculture value chain in order to implement a better end-of-life management of agriculture plastics across Europe. In a first phase, the current situation will be analysed

in order to fully understand the achievements and actions needed from the industry to better dispose of agricultural plastics waste. Once this picture is settled, the industry will elaborate an action plan that will enable better recycling rates.

## And the winner is... : Innovation Award for best-recycled product

### EPRO's second innovation competition demonstrates value of recycled plastics

Following the success of the first Best Recycled Product Competition in 2009, EPRO invited the European plastics industry once again in 2010 to provide examples of products made of recycled plastics

This very successful competition aims at raising awareness on plastics' life-cycle along with stimulating demand for recycled materials. Since it was first organised in 2009, it has seen over 60 entries from 13 countries.

The 2010 entries were judged by a pan-European panel composed of representatives from EPRO, PlasticsEurope and EuPR. The Awards ceremony was held during IdentiPlast 2010, a two-day international event on waste management, held on November 2010 in London.

### The top three winners were:

1. Enjoy Kitchen Tools, TEFAL SAS - **France**
2. eko84®, Retail Shopping Trolley, Keo S.r.l - **Italy**
3. FORMaBLOCK, Innovation in low cost construction, FORMaBLOCK - **UK**

### Worth the effort

Hundreds of thousands of tonnes of recycled plastics are used as raw material for new products. This material can be cheaper and sometimes even superior to alternatives. The competition therefore focused on several criteria. The entries had to contain at least 50% of recycled plastics, they had to be made up of used plastics packaging, to be available on the market since 2008 and, finally, to be manufactured in Europe.

The results of "The Best Recycled Product" competition shows that major companies operating on a global level such as TEFAL, recognise that recycled plastics are a valuable raw material for their products.

The "Best Recycled Product" competition will be taking place again in 2011, to demonstrate the added-value and benefits of integrated waste management solutions. The awards ceremony to announce the winner will be celebrated during the IdentiPlast 2011 conference in Madrid on 3-4 October 2011.



© Enjoy Kitchen Tools,  
TEFAL SAS

In 2010, TEFAL won  
"The Best Recycled Product" award  
with Enjoy Kitchen Tools.

## Who we are

The European plastics industry contributes significantly to the welfare of Europe. Plastics drive innovation, improve quality of life, and facilitate resource efficiency and climate protection. More than 1.6 million people work in over 54,000 companies – 95% of them being SMEs (small and medium-sized enterprises) for the conversion sector – generating turnover in the region of over 300 billion euros per year.

**PlasticsEurope** is the organisation representing Europe's plastics manufacturers. It networks with European and national plastics associations and has 100 member companies, producing over 90% of all polymers across the 27 EU Member States plus Norway, Switzerland, Croatia and Turkey. PlasticsEurope is a leading European trade association, with offices in Brussels, Frankfurt, London, Madrid, Milan and Paris.

**EuPC** – the European Plastics Converters – is the professional representative body of plastics converters in Europe. Their activities cover all sectors of the plastics converting industry, including recycling. Their main objective is to defend and promote the European plastics converting industry's 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

**EuPR** – the European Plastics Recyclers – is the professional representative body of plastics recyclers in Europe. EuPR promotes plastics mechanical recycling and an environment that encourages profitable and sustainable business. They provide a platform for members, who represent 85% of Europe's recycling capacity, processing over 5 million tonnes of collected plastics per year.

**EPRO** – the European Association of Plastics Recycling and Recovery Organisations – is the association of the national organisations responsible for organising and promoting recycling and recovery in Europe. EPRO provides a unique forum for leading European specialists in plastics waste management to exchange learnings, develop integrated plastics packaging waste strategies and support technological development.



## Structure

This report on 2010 production, demand and recovery is an annual publication by the European plastics manufacturers and their partners. This is the 20<sup>th</sup> edition of this report.

The aim is to provide definitive facts about the plastics market, from development and production, through their many uses, to the advances made in recovering plastics at the end of their life.

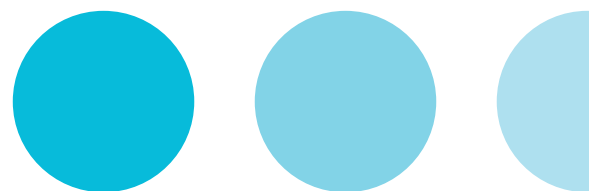
Data is collected by a partnership involving PlasticsEurope, EuPC (the European Plastics Converters), EuPR (the European Plastics Recyclers) and EPRO (the European Association of Plastics Recycling and Recovery Organisations).

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.

All figures and graphs in this report show data for EU27+ Norway and Switzerland – referred to as Europe. Any other group of countries is specifically mentioned.

Official statistics have been used for recovery and trade data, where available, from European or national authorities and waste management organisations. Research or expertise from consultants has been used to complete any gaps.

Figures cannot always be directly compared to previous years due to changes in the estimates of both market demand and the waste generated. Some estimates from previous years have been revised in order to track progress, e.g. for use and recovery of plastics across Europe in the past decade.





## Plastics

The Material for the 21<sup>st</sup> Century

## Glossary of terms

ABS	Acrylonitrile butadiene styrene
APE Europe	Agriculture plastics films producers
CE	Central Europe
CEN	The European Committee for Standardisation
CIS	Commonwealth of Independent States
CNTs	Carbon nanotubes
CO <sub>2</sub>	Carbon Dioxide
ECPI	European Council for Plasticisers and Intermediates
ECVM	European Council of Vinyl Manufacturers
EfW	Energy from Waste
EPR	Extended Producer Responsibility
EU	European Union
EuPC	European Plastics Converters
EuPF	European Plastic Films
EuPR	European Plastics Recyclers
EPRO	European Association of Plastics Recycling and Recovery Organisations
ESPA	European Stabiliser Producers Association
E&E	Electrical & Electronic equipment
GDP	Gross domestic product
GPS	Global Positioning System
GPCA	Gulf Petrochemicals and Chemicals Association
HSE	Health, Safety and Environment
IV	Intravenous
k tonne	Thousand Tonnes
Kg	Kilogramme
MBT	Mechanical Biological Treatment
Mtonne	Million Tonnes
MRF	Material Recovery Facility
MSW	Municipal Solid Waste
NAFTA	North American Free Trade Agreement
NGOs	Non governmental organisations
OLED	Organic light emitting diode
PA	Polyamide
PE	Polyethylene
PE-HD	Polyethylene, high density
PE-LD	Polyethylene, low density
PE-LLD	Polyethylene, linear low density
PEMRG	PlasticsEurope Market Research Group
PET	Polyethylene terephthalate
PUR	Polyurethane
PMMA	Polymethyl methacrylate
PP	Polypropylene
PRF	Plastics Recovery Facilities
PS	Polystyrene
PS-E	Polystyrene, expandable
PVC	Polyvinyl chloride
SAN	Styrene-acrylonitrile plastic
SMEs	Small and medium sized enterprises
SRF	Solid Recovered Fuel
UK	United Kingdom
UN	United Nations
WE	Western Europe





Avenue de Cortenbergh 71  
1000 Brussels - Belgium

Phone +32 (0)2 732 41 24  
Fax +32 (0)2 732 42 18

info@plasticsconverters.eu  
www.plasticsconverters.eu



Koningin Astridlaan 59  
1780 Wemmel - Belgium

Phone +32 (0)2 456 84 49  
Fax +32 (0)2 456 83 39

info@epro-plasticsrecycling.org  
www.epro-plasticsrecycling.org



Avenue de Cortenbergh 71  
1000 Brussels - Belgium

Phone +32 (0)2 742 96 82  
Fax +32 (0)2 732 63 12

info@plasticsrecyclers.eu  
www.plasticsrecyclers.eu

**PlasticsEurope**  
*Association of Plastics Manufacturers*

Avenue E. van Nieuwenhuysse 4/3  
1160 Brussels - Belgium

Phone +32 (0)2 675 32 97  
Fax +32 (0)2 675 39 35

info@plasticseurope.org  
www.plasticseurope.org

