



PLASTICS RECYCLERS EUROPE

20 YEARS LATER
& THE WAY
FORWARD

*Making more
from plastics waste*

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I. FOREWORD



“ Europe is highly dependent on the rest of the world when it comes to natural resources. With the increasing competition for raw materials it will continue to be affected by global trends. Resource depletion, growing population and waste management problems are the big challenges we will have to face in the coming decades. The business as usual scenario is not an option. With the current trends, by 2050, we will need 2.75 planets to sustain our consumption style. Therefore, investing in the green economy and supporting industries which bring answers to today's challenges will be a priority. Recycling is one of the key answers to efficient waste management. It saves resources, reduces GHG emissions and reduces waste. It also brings an answer to Europe's high dependence on the rest of the world when it comes to natural resources. Europe, being the leader of environmental policies, realized the opportunities and benefits of moving to a more sustainable economic model. A number of existing policy measures favour recycling, however, there is still room for improvement. Recyclers lack incentives to invest and innovate, especially today when this young industry is facing difficult times. Turning plastics waste into resource is one of the fundamental instruments to fight climate change and, more specifically, marine litter and landfill. ”



ANTOON EMANS,
President Plastics Recyclers Europe

WHAT IMPACT WILL THE CIRCULAR ECONOMY PACKAGE HAVE?



2020 6,5% of GHG savings would equal **15 millions** less cars on the roads **=** **EQUALS THE TOTAL OF CARS IN BENELUX**



2025 11,5% of GHG savings would equal **21 millions** less cars on the roads **=** **EQUALS THE TOTAL OF CARS IN POLAND**

RECYCLING AND WASTE MANAGEMENT

2020 50 000 NEW JOBS

2025 80 000 NEW JOBS

RESEARCH AND DEVELOPMENT, MANUFACTURE OF EQUIPMENT, MANAGEMENT ETC.

2020 75 000 NEW INDIRECT JOBS

2025 120 000 NEW INDIRECT JOBS

HOW CAN EUROPE ENHANCE PLASTICS RECYCLING?



IMPROVEMENT OF RECYCLABILITY / GLOBAL GUIDELINE: DESIGN FOR RECYCLING



HIGHER RECYCLING RATES



STANDARDIZATION AND HARMONIZATION OF COLLECTION & SEPARATE SORTING



CREATING A PULL MECHANISM FOR PLASTICS RECYCLATES & DEVELOPING SECONDARY RAW MATERIAL MARKETS



BAN ON LANDFILL FOR ALL PLASTIC WASTE



FURTHER INNOVATION IN MECHANICAL RECYCLING

II. ABOUT PLASTICS RECYCLERS EUROPE

Over the past twenty years PRE has led the way in the goal of developing a circular economy throughout the European Union. PRE was established in 1996 and to date represents approximately 80% of the European Union's mechanical recycling capacity.

PRE is one of the key stakeholders in the process of formulating, monitoring and evaluating the EU policies that impact plastics recyclers. The policies that affect recyclers fall under environmental policy which dates back to the 1972 and boomed in the 1990s when a number of legally binding targets were introduced.

Our organization has put plastics recycling in the spotlight of the public debate. Our actions have facilitated the creation of a Green Paper on Plastics which identifies public policy challenges induced by plastic waste that were not specifically addressed in EU waste legislation. PRE has supported the Circular Economy Package focusing on plastics waste and stands behind an increase of the recycling targets to 55% by 2020. Through its various activities, PRE has increased awareness about waste exports management and has highlighted inconsistencies between the waste legislation and REACH. A number of policy actions carried out by PRE have contributed to the growing structure of the plastics recyclers market. The plastics recycling industry in Europe has a potential to grow and to help to manage waste problem more efficiently. However, in order to fully exploit this potential we need conditions that would enable growth and more investments. Without these conditions the road to eradicate marine litter and other environmental issues will be much more arduous.

PRE provides plastics recyclers with representation at the European level and among leading industry organizations. It promotes the use of quality plastic recyclates and offers concrete advices to develop innovative products and packages that have an eco-friendly design. Through the implementation of the EuCertPlast programme, Plastics Recyclers Europe has promoted the harmonization and development of pan-European standards for plastics recyclates. Within the industry itself, PRE provides its members with a platform via which companies from its various working groups can network and communicate freely with one another.

Plastics recycling refers to any recovery operation through which plastic waste materials are reprocessed into products, materials or substances for their original use or other purposes and thus are re-injected to the economy. It has emerged as a relatively new industry, consisting of more than 1.000 companies and employing approximately 30.000 people. Originally, plastics recycling grew alongside the growth of the plastics industry, with companies initially concentrating on the reprocessing of production and processing scraps. However, as the recycling industry grew, the recycling of post-consumer plastics gradually took-off. A significant amount of growth in the plastics recycling sector has been recorded over the last decade.

III. INDUSTRY OVERVIEW

Current plastics recycling rates are very low in comparison to other materials.

(...)There is far too little separate plastic waste collection in Europe. Far too much goes to landfill, and much of what is counted as recycled is actually going to energy recovery. As long as only 6 out of 21 million tonnes of post-consumer plastic are recycled, we should not rest. 50% of it is still lost in European landfills and that is why landfill diversion remains an avenue to pursue.

KARMENU VELLA, European Commissioner for Environment, Maritime Affairs and Fisheries

Closing the loop conference on the Circular Economy, 25 June 2015

MARKET DATA – MARKET DEVELOPMENT



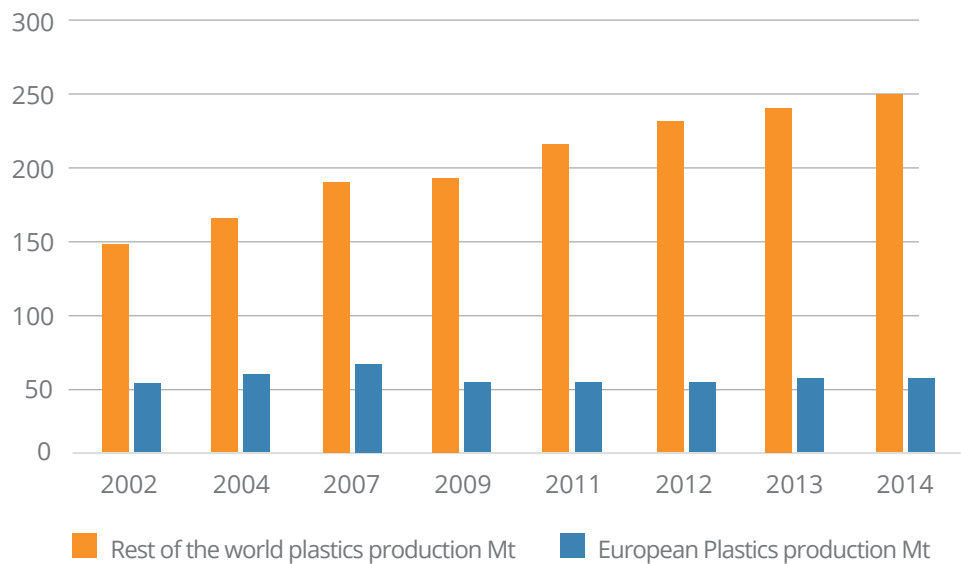
The plastics industry is a major sector of the European economy and is rapidly growing as plastic finds more and more applications.

Plastic is a versatile material which is used in a number of applications and markets. It has substantially improved the quality of our lives in a number of ways due to its intrinsic qualities which can guarantee lightweight, flexibility, safety, durability and many other benefits. Plastics allow, for example, extensive savings on transportation costs due to their lightweight. They preserve food's quality and freshness for an extended period of time and help fighting the food waste problem. It has a long life span and thanks to that it is often used for pipes and ducts. Plastic is easy to mould and is very flexible which allows the creation of virtually any form allowing architects and designers for more freedom of design. These are just a few examples of the outstanding properties of plastics as they are also extensively used in the automotive sector, electronic and electrical sector, medical applications, agricultural applications, furniture and sport equipment, to name just a few.

The total global production of plastics grew from around 1.5 million tonnes in 1950 to 311 million tonnes in 2014. Post-consumer plastic waste collection reached 25.2 million tonnes in 2012, an increase in comparison to 2011. Plastics consumption rate in Europe, nevertheless, is around 60 million tonnes per year.

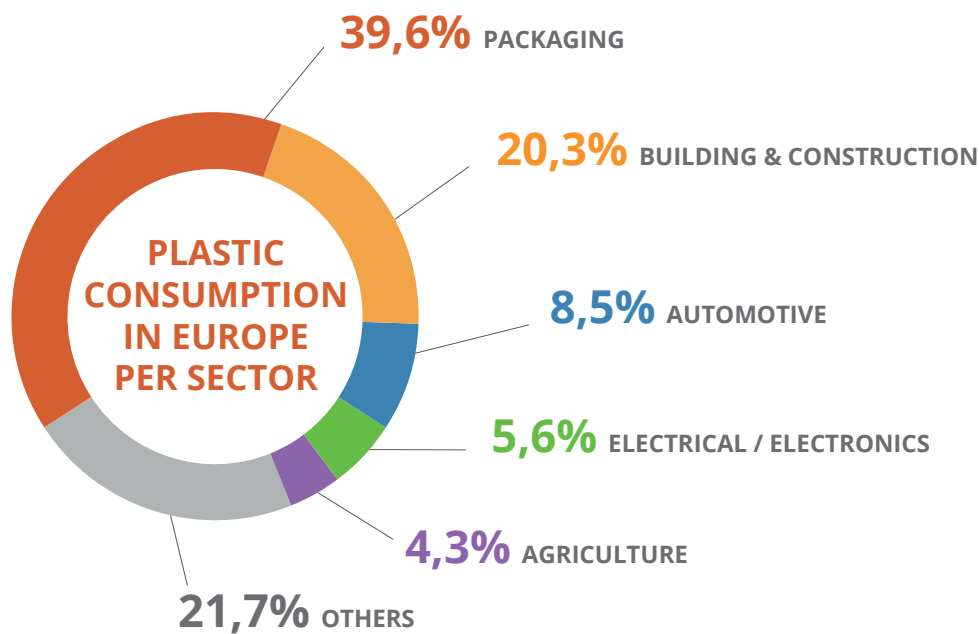
There are promising signs in the growing collection and recycling activities around Europe. Today the recycling industry plays a significant role in Europe’s move towards a sustainable society. It needs, however, clear policies, standards and economic incentives to enable its expansion.

EU VS REST OF THE WORLD PLASTICS PRODUCTION



source: PlasticsEurope (PERMG/Consultic)

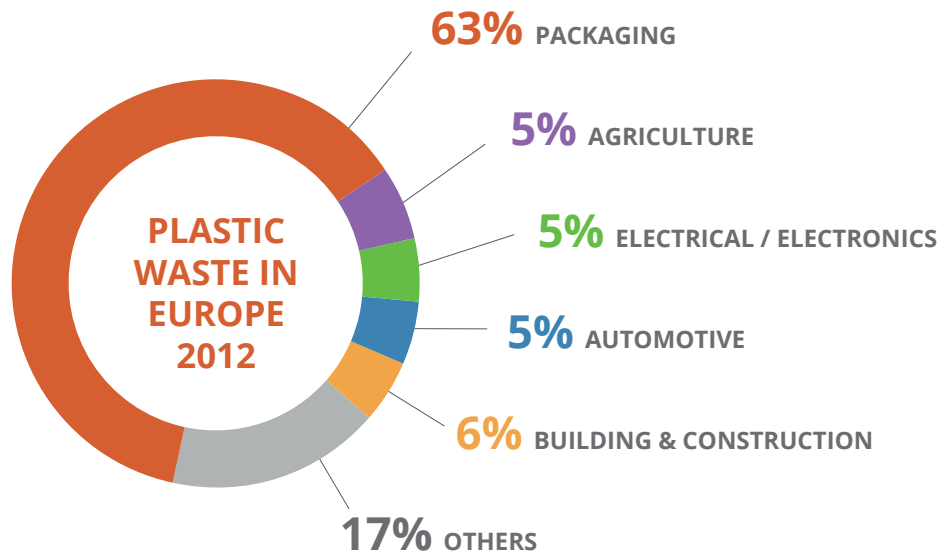
The European plastics demand in 2013 reached 46.3 million tonnes. The three predominant markets for plastics are: packaging - the leader of the group with 39.6 % of the market share - building and construction which covers 20.3% and the automotive market with 8.5% of the total market share.



(2013, source: PlasticsEurope (PERMG) / Consultic / ECEBD)

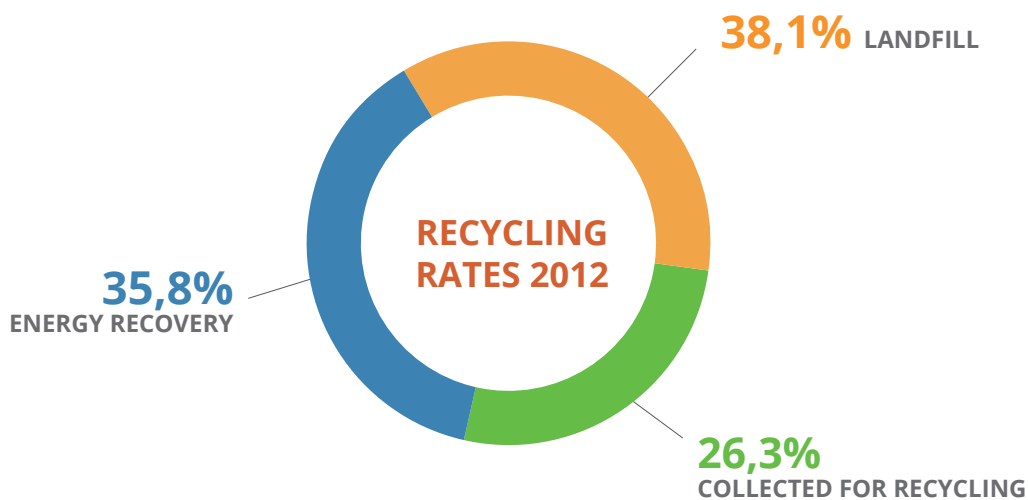
PLASTICS RECYCLING INDUSTRY OVERVIEW: COLLECTION, SORTING & RECOVERY OPERATIONS

The biggest source of plastic waste remains packaging and consequently the most plastics waste that is currently recycled comes from this stream.



Source: Plastics the facts

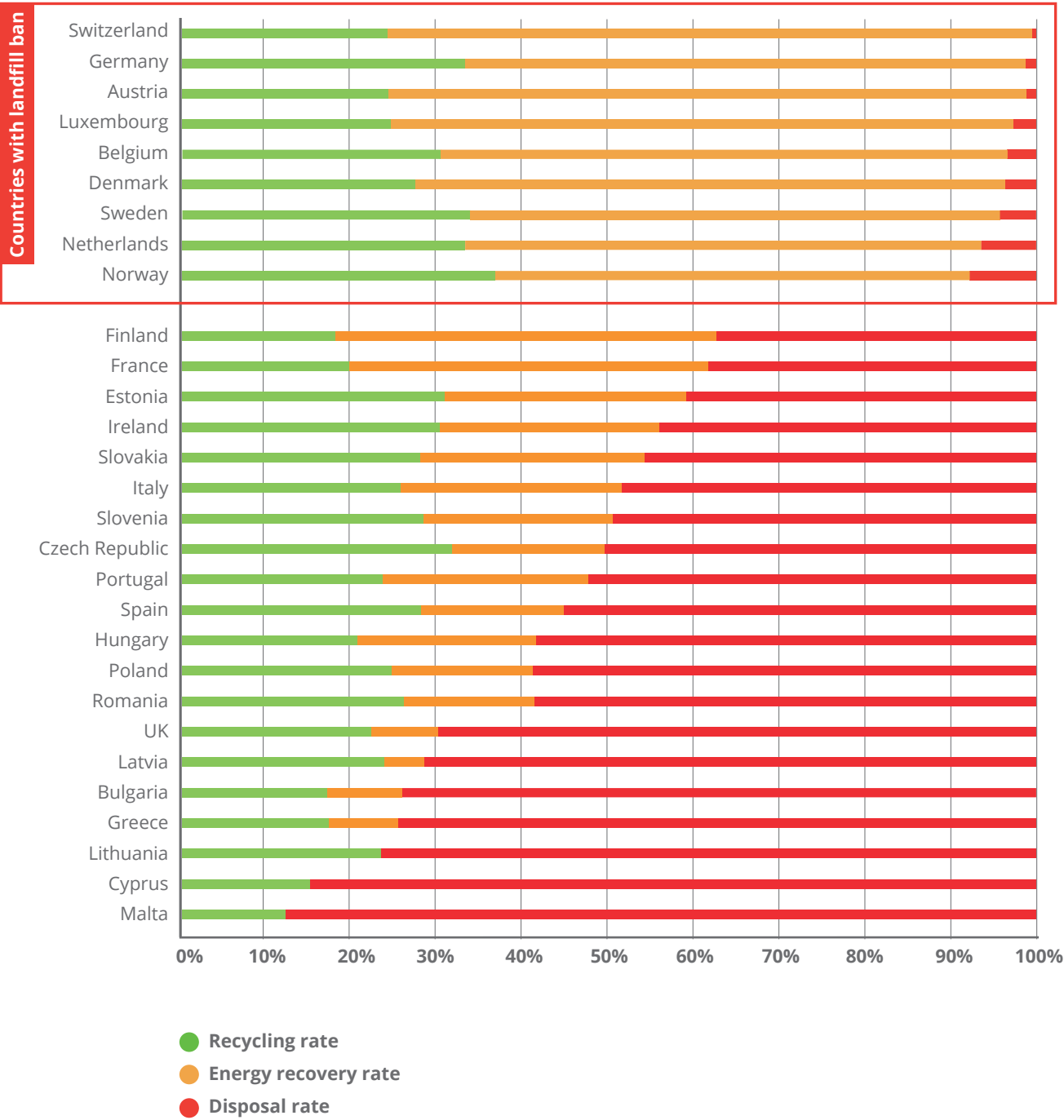
There is a positive trend observed in Europe in the recovery of plastics that less plastic waste is ending in landfills. In 2012, out of the 25, 2 Mt of plastics collected for recycling 6.6 Mt were recycled and 8.9 Mt were incinerated. The challenge to recycle more and to fully implement the waste hierarchy model, with prevention, reuse, recycling, recovery and disposal as the least preferable option, remains.



Source: Consultic

Specifically, diverting plastics from landfill is one of the biggest challenges. Although a gradual reduction in landfill can be observed, it is still one of the most popular waste management operations in many European countries. The leading EU countries in recycling and recovery are the countries who observe a landfill ban. It is noted that in those countries it is the incineration which leads the recovery activities. Incineration shall be applied only if it is not possible to recycle the waste it is important, therefore to accompany landfill bans with strict regulations regarding what kind of waste can be incinerated.

TREATMENT OF POST-CONSUMER PLASTIC WASTE (DATA 2012)



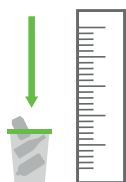
OBSTACLES TO PLASTICS RECYCLING



10.000 TRUCKS/AND OR SEA CONTAINERS 40 FT LONG OF PLASTIC WASTE LEAVE EUROPE EVERYDAY *(where waste is reprocessed in poor health & safety conditions without quality standards)*



NO GLOBAL ECO-DESIGN GUIDELINES, NOT WELL-THOUGHT OUT DESIGN HAMPERS THE RECYCLING PROCESS



ONLY A SMALL PLASTIC WASTE FRACTION IS COLLECTED, THERE ARE NO HARMONIZED REGULATIONS ON WASTE COLLECTION AND SORTING



VOLATILE PRICES OF RAW MATERIALS

IV. PLASTICS RECYCLING: GROWTH & ENVIRONMENT

European policies and policy initiatives targeting recycling are principally motivated by the environmental benefits. Nevertheless, it is important to underline the numerous economic and social impacts that recycling can offer, such as, creating more jobs and therefore, leading the transition towards the green economy.

ECONOMIC ASPECT & SOCIAL IMPACTS



Recycling is pertaining to be an important sector of the European economy as direct revenues from recycling constitute considerable and constantly growing contributions. An increase of the recycling rates targets is a prerequisite in order to have an impact not only on the environment but also on the economy and the job market in particular. It was estimated that by enforcing higher recycling rates across the Member States up to 50.000 new jobs could be created by 2020 for in the recycling value chain including the recycling process itself and waste management. This increase would have an effect on down and upstream sectors as well as on the wider economy, resulting in the creation of an additional 75.000 of indirect jobs concerning construction of new recycling facilities, manufacturing equipment for recycling, mainte-

nance of recycling facilities and equipment, research and innovation, as well as jobs related to administration and management. This number could grow to 80 000 in direct jobs and 120 000 in indirect jobs by 2025 . Regarding the direct job creation, the most significant increase would occur at sorting and separation of material as well as at collection and recycling. It is worth noting as well that direct jobs are mainly related to low-skilled workers has and thus have an implication on social inclusion and poverty alleviation for a number of people with fewer possibilities of employment. Energy recovery on the other hand is very low job-intensive and does not have an impact on job creation. More with less is possible: creating more jobs and having less waste and in effect less pollution.

ENVIRONMENTAL IMPACTS



Recycling is one of the most beneficial and environmentally friendly options of all of the waste management methods. The environmental benefits of replacing incineration or landfill with recycling are numerous. Recycling diverts waste from landfills which has an impact on lower greenhouse gas emissions (GHG). Recycling also has lower environmental impacts when compared to virgin materials production i.e. avoiding oil extraction and refining which has an immediate impact on saving natural resources and energy.

Taking into account the whole plastics recycling value chain, including collection, pre-treatment/sorting, transportation, recycling and the options of energy recovery and landfilling, a significant reduction in GHG emissions is expected in 2020 if the targets set in EU legislation are met. The GHG savings of plastic recycling could therefore result in 6.5% (which would translate into 15 mln less cars on the roads in Europe) less emissions of the EU plastics industry by 2020 and 11.5% less emissions by 2025² (which translate into 21 mln less cars on the roads in Europe), considering a constant level of plastic production.

1. *Increased EU Plastics Recycling Targets: Environmental, Economic and Social Impact Assessment, Final Report. Plastics Recyclers Europe, written by Mathieu Hestin, Thibault Faninger and Leonidas Milios; (May 2015).*

2. *Increased EU Plastics Recycling Targets: Environmental, Economic and Social Impact Assessment, Final Report. , written by Mathieu Hestin, Thibault Faninger and Leonidas Milios; (May 2015).*

V. WAY FORWARD

CIRCULAR ECONOMY



A circular economy could increase the efficiency of primary resource consumption in Europe and the world. By conserving materials embodied in high value products, or returning wastes to the economy as high-quality secondary raw materials, a circular economy would reduce demand for primary raw materials. This would help to reduce Europe's dependence on imports, making the procurement chains for many industrial sectors less subject to the price volatility of international commodity markets and supply uncertainty due to scarcity and/or geopolitical factors.

European Environmental Agency

Circular Economy in Europe, Developing the knowledge base. EEA Report No 2/2016

With the latest forecasts suggesting that the global population is likely to exceed 11 billion³ by the end of the 21st century and with the evident depletion of natural resources as well as the ever growing marine litter problem, it is impossible to ignore the problems created by the way we produce, consume and dispose our waste. A new approach is needed to answer the environmental problems. The concept of circular economy challenges the current linear model. Its prerogative is resource conservation and it has the potential to fully close the loop.

According to the report by Ellen MacArthur⁴, by 2050 there will be more plastics in the oceans than fish if we continue with the business as usual - the 'take, make, dispose' model which is highly unsustainable. The scale of this alarming news shows how global waste management has been neglected over the past decades. Marine litter affects biodiversity, it enters the food chain and eventually has an impact on our health. Adopting the circular economy, which stands for eco-design, waste prevention, recycling and energy efficiency, would tackle this problem. Designing eco-friendly, easily recyclable and energy efficient products by using fewer resources would enable manufacturing durable goods which could be recycled into quality recyclates. Incineration should be the last resort used when options like recycling, repair or reuse are not feasible. As a consequence, the maximum of available resources would be restored and virtually no waste would be landfilled. Furthermore, this transition would result in a snowball effect by positively impacting our lives, our health and would save natural resources, boost creation of cleaner industries, reduce our dependency on foreign resources and boost new jobs and new technologies.

Circular economy is an important tool to challenge energy consumption, resources depletion and pollution. It is the pillar of sustainable development as it enables decoupling of economic development from the natural resources consumption. The momentum is there Europe is in the position to become the pioneer of the green economy and to offset the negative externalities of the linear model. Europe has laid out the ground work to facilitate the transition by introducing the Circular Economy Package. However, it is not acceptable that recycling still remains in the 3rd position behind landfilling and incineration. By pushing for higher targets, global recyclability guidelines, landfill bans and standards on sorting we can change the current state of the affairs.

3. World Population Prospects, The 2015 Revision, Key Findings and Advance Tables, Working Paper No ESA/P/WP.241. United Nations, Department of Economic and Social Affairs, Population Division. New York. 2015.

4. The New Plastics Economy: Rethinking the Future of Plastics. Ellen MacArthur Foundation, 2016.

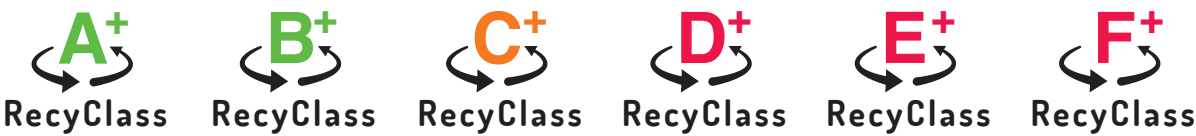
- RECYCLASS -
THE RECYCLABILITY TOOL FOR PLASTIC PACKAGING IN EUROPE



Plastic packaging recycling does not begin with collection but design. Not well thought design often leads to leftover residue in emptied packages. Ill-prepared combinations of polymers and materials like: paper, metal, fibers in packaging can create incompatibilities with efficient recycling processes. Recycling processes are very often hampered by: inseparable composites of polymers, use of unnecessary additives or by combining plastics with other materials like: paper, metal, fibers in a way that that does not allow for an easy separation.

The primordial criterion of the packaging design nowadays is its high performance. The new challenge, however, should be to incorporate the recyclability aspect and to make it a requirement on top of the other performance criteria like: product safety, transport safety, shelf life, marketing & branding as well as recyclability. It is important to balance those various objectives of a plastic package.

RecyClass' aim is to improve the design of packaging so that it is easily recyclable into a quality secondary raw material to then be used in a new plastic product. Far too much of plastic packaging is not fit for this purpose and hence destined for energy recovery only – the last but one option in the waste hierarchy pyramid. RecyClass is an online tool which allows the assessment of virtually any plastic package from the point of view of its recyclability. The tool uses the class system from A to G which resembles the energy efficiency rating. In a few simple steps the environmentally-friendly design of a package can be verified.



The tool provides advice and recommendations on how to improve design of packaging in case the packaging scores rather poorly in the assessment. In the last step of the evaluation, the package can be certified by an expert in order to use the RecyClass branding.

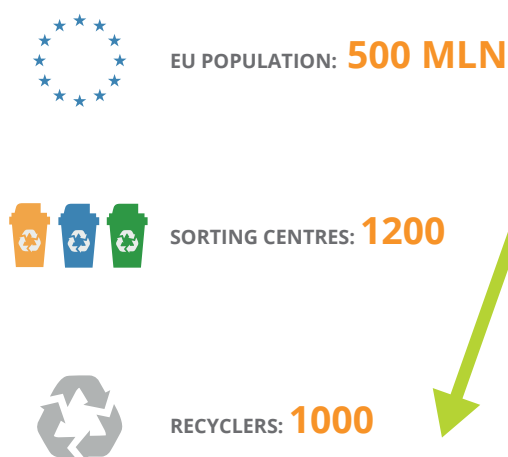
By improving packaging design, RecyClass will help divert substantial quantities of plastics away from landfill & incineration and help reach the new higher recycling targets while saving the natural resources.

SORTED PLASTIC WASTE



The circular economy model can be successful only if the secondary raw material markets are fully operational. This can be facilitated by promoting both the demand and the supply.

In our view secondary raw materials markets shall be defined as sorted waste which is to be sold and used for final recycling. At present they still account for a very small portion of the material used in the EU. The quality and supply of secondary raw materials depends greatly on waste management practices and the degree of separation of material streams at source. However, other barriers to the development of markets for secondary raw materials can be identified. The plastics recycling market is not as structured, transparent or efficient as the market of the virgin plastics producers. It is very fragmented and a European standardisation is absent. For instance, each European collector has its own rules and requirements to sell their waste to recyclers. This lack of harmonisation does not encourage recyclers to comply with any European scheme.



Secondary raw materials markets for sorted plastic waste are essential to creating a level playing field for recycled and virgin plastics. Fully functional secondary raw materials markets would drive end markets and as a result boost collection and recycling of plastics. It is extremely important to give equal attention to the demand of the recycled plastics. The EU waste management and recycling strategy shall also concentrate on the 'pull' mechanism for recyclates. There are number of solutions, such as economic instruments, to improve the situation. The 'pull mechanisms' could take, for example, the form of taxes reduction for compa-

nies producing recyclates, or lower taxes on products with recycled content. Subsequently, this would give an additional impulse to go for environmentally friendly products not only for consumers but for companies as well. Analogically, taxes could be increased for products which are non-recyclable but also for landfilling and incineration. Additionally, it is crucial to increase the transparency of the Extended Producers Responsibility scheme which would go beyond packaging and electronic and electrical equipment. In the long term, this would have an impact on products' design.



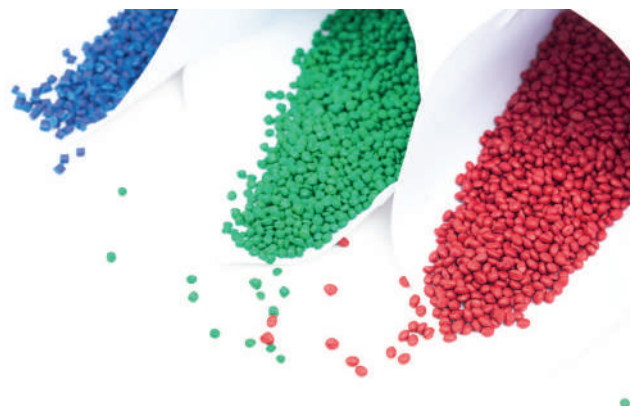
Reinforcement of the demand of recyclates can be achieved as well by Green Public Procurement and in fact stimulating the public sector consumption so that it has a lower environmental impact. Following this logic, a requirement for public spaces to install furniture with a recycled content only could be an example of a good initiative. Demand can be created by educating consumers to make more environmentally friendly choices by for example buying products with recycled content.

It is worth mentioning that major brand owners and retailers implement Corporate Social Responsibility programmes which feature prominent use of products with recycled content. This gives grounds for engaging these actors with the plastics and plastics recycling industry and to raise the profile of collection and quality recycling all over Europe.

Supply, on the other hand, can be promoted by creating favourable investment environment including suitable infrastructure which would allow producing quality recyclates. The secondary raw materials shall not be at a disadvantage due to the regulatory requirements.

It is undeniable that fully functional secondary raw materials markets could be achieved if number of existing, often very complex and varied, rules would be harmonized across the Members States.

In order to boost recycling things need to change on the macro and micro level, however, it is the EU who shall enforce the single market approach and to define the right conditions for economic instruments to be fully operational and effective. Driving end users market by introducing harmonization and standards across the plastics recycling industry will bring increase not only in quantity but also in quality of recyclates. This in turn is an essential step to make a shift from a linear to the circular economy model, to fully exploit the surplus materials and to move away from the 'throw away' society.



- EUCERTPLAST – THE CREDIBLE CERTIFICATION SCHEME IN EUROPE



EuCertPlast is an EU-wide certification aimed at post-consumer plastics recyclers. It was developed via a three-year project co-financed by the European Commission under the Eco-Innovation Programme. The certification works according to the

European Standard EN 15343:2007 which specifies the procedures needed for the traceability of recycled plastics. EuCertPlast aims at encouraging an environmentally friendly recycling of plastics, particularly by focusing on the process of traceability and assessment of conformity and content of recycled plastics. The overall objective of this certification is to establish a wide certification scheme for post-consumer plastics recycling.

RECYCLING TECHNOLOGIES

Plastics recycling is a fairly young industry and the technology of recycling processes has been substantially improved over the last decade. The recycling process is under constant development in order to become more innovative, efficient and sustainable. Today it is possible to recycle more plastics streams than it was possible ten years ago. Packaging is still the leader but growth in sectors like building and construction as well electronic and electrical equipment has been recently observed. New technologies allow today to recycle multilayer and even very thin films. Moreover, the washing technologies have improved. Recycling of highly contaminated waste, especially agricultural waste or waste for food contact application, requires washing with water. Nevertheless, a number of recycling facilities possess closed-loop water systems which allow water savings. Less contaminated waste, on the other hand, can be nowadays dry-cleaned. Investment in new technologies will unlock new opportunities and jobs in areas such as sorting, shredding, grinding, washing, drying and extrusion. New technologies will play an essential role in driving the move towards the circular economy. More precise and cost-efficient ways of recovering plastics are needed to make the industry more competitive.



Courtesy of CeDo

Thanks to automatization, robotics and real time waste flows, surveillance of the resources will be used more efficiently both in production phase as well as in logistics. Digitalization will undoubtedly have an impact on improving the recycling processes.

VI. CHALLENGES & OPPORTUNITIES

The recycling of plastic waste in Europe has a substantial potential, however, there are a number of challenges and barriers that need to be overcome in order to fully exploit the secondary raw materials that Europe has at hand.



DESIGN FOR RECYCLING

The design of the already existing products needs to be enhanced by introducing global **eco-design guidelines** in order to improve the recyclability and reusability. Adapting the design will have a great potential to make savings on the EPR costs.



WASTE COLLECTION & SORTING

First of all, the **collection** numbers as well as the **quality of sorted waste** need to increase. The quality of the sorted waste is one of the first steps to increase efficiency of the circular economy which would have a cost impact on the rest of the cycle and help to improve financing of the system. Moreover, EU, standards & harmonization will help consolidate the market in Europe.



LANDFILL BAN

Waste diverted from landfill is a resource that could be recycled and, only if that option is not possible, incinerated.



HIGHER RECYCLING RATES

The higher the targets the more motivation there is to increase recycling rates, this positively influencing the economy and environment. It is observed that Member States who are more advanced and experience tend to help the less advanced ones.



SECONDARY RAW MATERIALS MARKET & PULL MECHANISM

The creation of a **market for secondary raw materials** needs to be facilitated and any obstacles to achieve it should be removed. The circular economy can only be achieved by creating well-functioning secondary markets. Subsequently, the demand for recycled plastics needs to be increased by, for example, introducing the **minimum recycled content** in the new products.

An important factor which heavily influences plastics recyclers in Europe are exports of plastic waste to the developing countries where very often it is processed below the EU standards and frequently putting in danger the health of the workers. **Plastic waste exports** hamper the expansion of the EU market's recycling capacity.



MECHANICAL RECYCLING

The **recycling capacity** across the Member States needs to be enhanced and improved via investments in the sector.



VII. CONCLUSION

It is impossible to ignore the waste management problem. The current economy model is highly unsustainable. The waste produced is a resource and should be re-injected into the economy. With the full implementation of the Commission's Circular Economy Package proposal, the transition from a linear to a circular model will accelerate the positive changes in the waste sector and will have an immediate impact on our lives. Companies, consumers and public sector are all actors in a circular economy. Consumer behaviour and consumer choices are important in creating demand and guiding a company's activity. Public sector also plays vital role as it may stimulate demand via public procurement, infrastructure and services.

Development of the recycling processes also lies within in the power of education and awareness. The concept of sustainable development should be included at all levels of education, from primary school to university levels. It is vital to promote EU wide consumer campaigns encouraging consumers to be more active and to make choices that support environmentally friendly practices. Education is a powerful tool to develop the next generation of entrepreneurs, engineers and policy makers who will be much more aware of and sensitive about decoupling growth from the exploitation of natural resources.

Europe should take the lead on moving towards a more sustainable model, however, we should not forget that the material flows are global and that this new model should also be viewed from a global perspective.

Understanding the opportunities and benefits of recycling as well as investing capital in recycling will accelerate the transition towards circular economy and will help fight the current waste management system inefficacies.

