

## TOWARDS A CIRCULAR ECONOMY– A ZERO WASTE PROGRAMME FOR EUROPE

DANA CORINA DESELNICU<sup>1</sup>, GHEORGHE MILITARU<sup>1</sup>, VIORICA DESELNICU<sup>2</sup>,  
GABRIEL ZĂINESCU<sup>2</sup>, LUMINIȚA ALBU<sup>2</sup>

<sup>1</sup>University POLITEHNICA of Bucharest, 313 Splaiul Independentei, sector 6, Bucharest, Romania, [dana.deselnicu@upb.ro](mailto:dana.deselnicu@upb.ro)

<sup>2</sup>INCDTP - Division: Leather and Footwear Research Institute Bucharest, 93 Ion Minulescu str., sector 3, RO- 031215 Bucharest, [viorica.deselnicu@icpi.ro](mailto:viorica.deselnicu@icpi.ro)

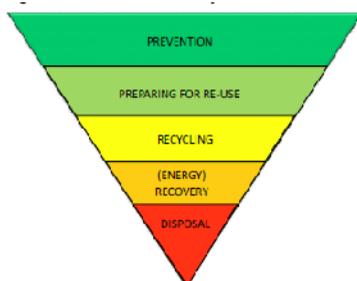
This paper presents key elements of the revised waste proposals. From the new waste proposals will benefits the economy, citizens and the environment. Clear rules, common standards and support for the use of more secondary raw materials will create a safe and sustainable supply of raw materials to the industry. This helps create new jobs, supports innovation and boosts competitiveness. Improved waste management rules will reduce landfill and tipping fees. Smarter use of resources is not only good for business, but will also help protect the environment preserve essential resources for current and future generations, and create synergies for industries which most depend on it – such as tourism, agriculture and food manufacturing.

Keywords: circular economy, waste management, secondary raw materials, recycling materials

### INTRODUCTION

Circular economy systems ([http://ec.europa.eu/environment/circular-economy/index\\_en.htm](http://ec.europa.eu/environment/circular-economy/index_en.htm)) keep the added value in products for as long as possible and eliminate waste. They keep resources within the economy when a product has reached the end of its life, so that they can be productively used again and again and hence create further value. Transition to a more circular economy requires changes throughout value chains, from product design to new business and market models, from new ways of turning waste into a resource to new models of consumer behaviour.

Waste management plays a central role in the circular economy: it determines how the EU waste hierarchy is put into practice. The waste hierarchy establishes a priority order from prevention, preparation for reuse, recycling and energy recovery through to disposal, such as landfilling. This principle aims to encourage the options that deliver the best overall environmental outcome.



Source: [European Commission](#).

Figure 1. The waste hierarchy

The Circular Economy package includes **specific proposals to amend the EU's waste legislation**, seeking to improve waste management practices, stimulate recycling and innovation in materials management, and limit the use of landfilling. The proposals will provide a clear and stable policy to allow long-term investment strategies focusing on prevention, reuse and recycling.

The aim of the paper is to present key elements of the revised waste proposal.

### **KEY ELEMENTS OF THE REVISED WASTE PROPOSAL (EUROPEAN COMMISSION, 2015a, b)**

In order to boost the economic, social and environmental benefits gained from the better management of municipal waste, the Commission proposes **to ban the landfilling** of recyclable plastics, metals, glass, paper and cardboard, leather and biodegradable waste by 2025, while Member States should endeavour to virtually eliminate landfill by 2030. Industry already recognises the strong business case for improving resource productivity. It is estimated that resource efficiency improvements all along the value chains could reduce material inputs needs by 17%-24% by 2030 (Meyer *et al.*, 2011) and a better use of resources could represent an overall savings potential of €630 billion per year for European industry (Europe INNOVA, 2012). Business driven studies based on product-level modelling demonstrate significant material cost saving opportunities for EU industry from circular economy approaches and a potential to boost EU GDP by up to 3.9% (Ellen MacArthur Foundation, 2012) by creating new markets and new products and creating value for business. It is not surprising therefore that companies are continually working to improve resource management, but they are held back by a range of market barriers.

The European Integrated Pollution Prevention and Control (IPPC) Bureau produces reference documents on Best Available Techniques, the so-called BREFs, which are used by competent authorities in EU Member States when issuing operating permits. BREFs incorporate best practices with regard to the resource use, residues and by-product' reuse and recycling as well as waste generation and management, therefore contributing to the EU initiatives on Circular Economy.

### **Targets (European Commission, 2015a)**

Turning waste into a resource is an essential part of increasing resource efficiency and closing the loop in a circular economy. Europe currently loses around 600 million tonnes of waste materials, which could potentially be recycled or reused. Only around 40% of the waste produced by EU households is recycled, with recycling rates as high as 80% in some areas, and lower than 5% in others. The proposal reflects a high level of ambition while taking account of the different realities and performance levels across the EU:

- a common EU target for recycling municipal waste of 65% by 2030;
- a common EU target for recycling packaging waste of 75% by 2030.
- material-specific targets for different packaging materials;
- a binding landfill reduction target of 10% by 2030.



Figure 2. Targets for reduction of waste by 2030  
([http://ec.europa.eu/environment/circular-economy/index\\_en.htm](http://ec.europa.eu/environment/circular-economy/index_en.htm))

### Measurements

- simplification and harmonisation of definitions and calculation methods to ensure comparable, high quality statistics across the EU;
- special rules for Member States facing the biggest implementation challenges;
- simplification of reporting obligations and alleviating obligations faced by SMEs;
- introduction of an Early Warning System for monitoring compliance with targets;
- steering Member States towards greater use of economic instruments (such as a landfill tax) to incentivise the application of waste hierarchy, to prioritise prevention, reuse and recycling, with disposal as the last resort.

### Incentives

- concrete measures to boost reuse activities, including a clearer definition and rules that expand the scope of reuse activities rewarded under the EU targets;
- general requirements for the operation of Extended Producer Responsibility (EPR) schemes – meaning a producer’s responsibility for a product is extended to the post-consumer stage of a product’s life cycle, aimed at improving their performance and transparency, including direct financial incentives for greener product design;
- clearer rules on by-products and end-of-waste criteria to stimulate the sharing of by-product resources among industries and markets for recycled materials;
- new measures to promote prevention, including for food waste and marine litter, and reuse;
- provisions to improve the traceability of hazardous waste.

### The Benefits to the Economy, Citizens and the Environment of the New Waste Proposals

These proposals will secure Europe’s **access to high quality and affordable raw materials**, making the economy more competitive in the context of volatile resource

prices, political instability, resource scarcity, and increasing global competition concerning the access to raw materials.

**Sustainable growth will boost job creation**, with more than 170,000 direct jobs potentially being created in Europe by 2030. A reduction in the total materials requirement of around 20 % can lead to an estimated 3 % boost in GDP. Measures such as better ecodesign, waste prevention and reuse could bring net savings to businesses in the EU of up to €600 billion or 8% of their annual turnover.

The proposals will contribute to **reducing greenhouse gas emissions**. More than 500 million tons of greenhouse gas could be avoided between 2015 and 2035, directly by cutting emissions from landfills and indirectly by recycling materials which would otherwise be extracted and processed. The proposals will reduce landfills, and their associated pollution.

The proposals will **reduce the administrative burden**, in particular for **SMEs**, as well as for public administrations, by improving definitions and simplifying reporting requirements.

## FROM WASTE TO RESOURCES

Recycling is a precondition for a circular economy – resources and materials can be recycled, returned back to the economy and used again. What was once considered as waste can become a valuable resource. To realise the potential of these so called secondary raw materials, we have to remove the existing barriers to their trade, improve the waste management practices and guarantee high quality standards. Only then can industry make full use of secondary raw materials and help ensure their secure supply.

### Recovering and Recycling Materials

In a circular economy, materials from products at the end of their lifecycle should be recovered through dismantling and recycling. Re-injecting these materials into the beginning of the product lifecycle reduces environmental impact and costs of production. We are proposing a number of tools to encourage and help this process.

### Trading in Secondary Raw Materials

The market and the EU single market for recovered and waste materials are still underdeveloped. While 45% of waste material from large companies is resold, this figure falls to only 25% for SMEs. We want to create common standards and market tools to improve this.

As an example, alongside the prevention and recycling of waste, an important pillar of **FCC Environment CEE** waste management approach is treating waste as a valuable resource. Using modern technologies, they are able to recover renewable energy from non-hazardous waste collected through our business and municipal waste operations. (Founded in Austria in 1988 **FCC Environment CEE** (formerly A.S.A. Group) is one of Europe's leading **waste and resource management** companies, **operating in eight countries in the CEE region** and employing a workforce of 4.300 international experts) (<https://www.fcc-group.eu/en/fcc-cee-group/about-us.html>).

**Handling more than 1/2 million tonnes of secondary raw materials per year**, extracting value and minimizing waste sent to landfill, they contribute to reducing environmental burdens for future generations and help save natural resources (<https://www.fcc-group.eu/en/fcc-cee-group/about-us.html>).



Figure 3. FCC Environment CEE waste management (<https://www.fcc-group.eu/en/fcc-cee-group/about-us.html>)

## KEY COMMISSION PROPOSALS

**Quality standards** – the lack of adequate tools to ensure the quality of secondary raw materials is a barrier to their take-up in the EU economy. Common standards are needed to build and support trade. The Commission will develop such standards where needed.

**Common rules on fertilizers** – diverging rules and standards hamper the manufacturing of organic and waste-based fertilisers from inputs such as food waste, sewage sludge or manure. The Commission will revise the EU regulation on fertilizers to help develop an EU-wide market for bio-nutrients while ensuring safety and quality of the EU Fertilisers.

**Using water again** – reuse of treated wastewater is a promising and under-exploited option in Europe. This can alleviate pressure on natural resources that are already scarce, and the reuse of water in agriculture also contributes to nutrients recycling. The Commission will take a series of actions to encourage the reuse of treated waste water, including legislation on minimum requirements for water reuse.

**Plastic as a recyclable resource** – smart design and proper sorting can increase the recycling rates of plastics and avoid landfilling, incineration and use of virgin materials. The Commission will elaborate a strategy addressing issues such as recyclability, biodegradability, the presence of hazardous substances of concern in certain plastics, and marine litter.

**Use of chemicals fitting the circular model** – to increase safety, facilitate recycling and improve the trust in and uptake of secondary raw materials, the Commission will promote nontoxic material cycles involving less and better traced chemicals of concern. The Commission will also examine how chemicals, products and waste legislation can best work together, including proposals to improve the tracking of chemicals of concern in products.

**Cross-border trade** – to facilitate the cross-border circulation of secondary raw materials, the Commission will simplify cross-border formalities through the use of electronic data exchange. It will also support an EU-wide research on raw material flows through the Raw Materials Information System.

## CONCLUSION

Clear rules, common standards and support for the use of more secondary raw materials will create a safe and sustainable supply of raw materials to the industry. This helps create new jobs, supports innovation and boosts competitiveness. Improved waste

management rules will reduce landfill and tipping fees. Smarter use of resources is not only good for business, but will also help protect the environment preserve essential resources for current and future generations, and create synergies for industries which most depend on it – such as tourism, agriculture and food manufacturing.

### *Acknowledgements*

This study was financially supported by UEFISCDI in the framework of Bilateral Cooperation project Romania – China, 2018-2019, contract 9BM/14.03.2018.

### **REFERENCES**

- Ellen MacArthur Foundation (2012), Towards the Circular Economy: Economic and business rationale for an accelerated transition, available at <https://www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf>.
- Europe INNOVA (2012), Guide to resource efficiency in manufacturing: Experiences from improving resource efficiency in manufacturing companies, available at [https://www.greenovate-europe.eu/sites/default/files/publications/REMake\\_Greenovate%21Europe%20-%20Guide%20to%20resource%20efficient%20manufacturing%20%282012%29.pdf](https://www.greenovate-europe.eu/sites/default/files/publications/REMake_Greenovate%21Europe%20-%20Guide%20to%20resource%20efficient%20manufacturing%20%282012%29.pdf).
- European Commission (2015a), Proposal for a Directive of the European Parliament and of the Council amending Directive 2008/98/EC on waste, [https://eur-lex.europa.eu/resource.html?uri=cellar:c2b5929d-999e-11e5-b3b7-01aa75ed71a1.0018.02/DOC\\_1&format=PDF](https://eur-lex.europa.eu/resource.html?uri=cellar:c2b5929d-999e-11e5-b3b7-01aa75ed71a1.0018.02/DOC_1&format=PDF).
- European Commission (2015b), Annex to the Proposal for a Directive of the European Parliament and of the Council amending Directive 2008/98/EC on waste, [https://eur-lex.europa.eu/resource.html?uri=cellar:c2b5929d-999e-11e5-b3b7-01aa75ed71a1.0018.02/DOC\\_2&format=PDF](https://eur-lex.europa.eu/resource.html?uri=cellar:c2b5929d-999e-11e5-b3b7-01aa75ed71a1.0018.02/DOC_2&format=PDF).
- Meyer, B. *et al.* (2011), *Macroeconomic modelling of sustainable development and the links between the economy and the environment. Final report*, available at [http://ec.europa.eu/environment/enveco/studies\\_modelling/pdf/report\\_macro-economic.pdf](http://ec.europa.eu/environment/enveco/studies_modelling/pdf/report_macro-economic.pdf).
- \*\*\*, [http://ec.europa.eu/environment/circular-economy/index\\_en.htm](http://ec.europa.eu/environment/circular-economy/index_en.htm).
- \*\*\*, [http://ec.europa.eu/environment/circulareconomy/index\\_en.htm](http://ec.europa.eu/environment/circulareconomy/index_en.htm).
- \*\*\*, <https://www.fcc-group.eu/en/fcc-cec-group/about-us.html>.