



WALKING THE CIRCLE – the 4 guiding pillars for a Circular Economy: Efficient material management, reduction of toxic substances, energy efficiency and economic incentives

The Circular Economy could bring significant environmental, social and economic benefits to the European Union. In order to deliver resource efficiency, job creation, low-carbon prosperity, a healthy environment, clean production and sustainable consumption, it is necessary to take a holistic approach by working across a number of policy areas. Failure to address every aspect of the issue by developing only partial solutions will prevent the EU from enjoying the overarching benefits the circular economy can provide.

This paper highlights four key areas the undersigned NGOs believe must be addressed by the EU institutions to ensure a fully functioning circular economy, and some of the often overlooked benefits that can result.

Resource Efficiency and Zero Waste: the basis of a true circular economy

Although we live in a planet of finite resources, global extraction of resources has been rapidly increasing¹. The European Union is a net importer of natural resources²; from precious metals to the water or land necessary to produce every product we consume. At the same time, our linear economic model results in 50% of Europe's municipal waste being landfilled or incinerated, generating considerable carbon emissions³. Our mismanagement of natural resources causes many environmental problems: climate change, depletion of resources, the release of toxic pollutants and marine litter, to name a few. It is estimated that fully implementing the EU's waste laws could save up to €72 billion⁴.

A true circular economy would reduce both inputs in the form of resources, and outputs, in the form of waste and emissions. The EU circular economy should aim to achieve high **resource efficiency, zero waste and zero emissions**.

The transition to a circular economy therefore requires fundamental changes across the entire economy based on the following interdependent pillars:

¹According to the SERI/WU Global Material Flows Database, global extraction has increased by 118% over the past 31 years <http://www.materialflows.net/trends/analyses-1980-2011/global-resource-extraction-by-material-category-1980-2011/>.

² European Environmental Agency, Environmental Indicator Report, 2014, 30.

³ Eurostat 2014, env_wasmun series reported that in 2013, 41.8% of EU-28 waste was recycled.

⁴ Bio Intelligence Service for European Commission DG Environment, Implementing EU Waste Legislation for Green Growth, 2011.

Material management from extraction to waste

Europe needs to radically increase the efficiency with which it manages its material resources, as measured by a continuing reduction in resource use per capita. This can be done by progressively closing the loop with effective product and waste policies.

To tackle Europe's resource dependency, the EU needs to measure and reduce its material, water, land and carbon footprints. The material footprint (based on Raw Material Consumption, already measured by Eurostat) should be included as an indicator in the European Semester.

Product design is fundamental to reach the goals of the circular economy. Good design can improve product and process performance, phase out hazardous materials, enable and incentivise the repair and reuse of products, and can also ensure the use of recycled and recyclable materials.

Product design-related requirements should be set by the EU in four ways: (1) through the full implementation of the Ecodesign Directive, and also its extension and adaptation to non-energy related products; (2) through the Waste Framework and Packaging and Packaging Waste Directives; (3) through existing tools such as Ecolabel, Green Public Procurement and Energy labelling and (4) through certification and standardisation tools.

A credible long-term zero waste policy is not only crucial in eliminating waste but also in creating a feedback mechanism at the end of life-cycle that allows products to be redesigned and to re-enter the economy, thus preventing them from becoming waste. Therefore, an enforceable waste hierarchy that guides activities towards prevention, reuse and recycle with ambitious targets, while promoting zero landfill and zero incineration is an absolute necessity. In addition, it is necessary to have harmonised definitions and a single measurement methodology to allow Member States to monitor the progress of each of these activities towards the common goal of zero waste.

Toxics, chemicals and health

A circular economy cannot work without clean production. Toxic substances should be avoided at the design stage to allow products and materials to circulate in a closed loop without endangering the quality of materials and the health of citizens, workers and the environment. This requires changing our approach to toxic substances so that in a circular economy, hazardous substances will not hinder the processes of reuse, repair and recycling.

This requires stronger application of REACH, and potentially more product-specific requirements, with the example of the ROHS directive; restricting substances used in new electronic equipment, as a potential model. Stronger regulations are needed to trace and minimise hazardous chemicals in products which endanger the capacity of the product or material to circulate repeatedly in the loop.

When a temporary exemption or authorisation has been granted to enable the continued presence of hazardous substances in products made from recycled material, the material should be labelled and associated with a specific marking.

Energy efficiency

The circular economy can contribute a great deal to Europe's energy efficiency drive. There is a huge potential in preserving the energy embedded in products and materials and preventing them from becoming waste; far more than can be generated by burning or landfilling them.

New methodologies must be developed to account for, and reward, the preservation of energy embedded in products or materials. Premiums for energy from waste incineration distort markets. Therefore they should not be considered unless there is a level playing field with embedded energy conservation, including taking into account the reduction of greenhouse gas emissions from prevention, reuse or recycling during comparison.

This new approach to energy management should be included in the new Energy Union strategy and be incorporated in the renewable energy and climate policies through the clean development mechanism. Although this already exists, it is currently channelling public money to finance infrastructure developments that contradict the very concept of the circular economy.

Instruments: economic incentives

Maximising resource efficiency and keeping materials circulating in the economy should be cheaper and simpler than consuming virgin resources. To facilitate this, the EU needs to change the current economic incentives that drive our linear consumption pattern.

A circular economy will require policies to make it legally and economically viable to sell services instead of goods, to sell durable goods that are repairable, reusable and upgradable, to promote shared or leased ownership, and to have a return or reuse programme. Wasteful practices should be made more expensive than these efficient ones.

To further encourage resource efficiency and zero waste, resource consumption should be made more expensive in comparison with product service, maintenance and repair operations, which should become cheaper. This would mean taxation shifting from labour to resources, especially virgin resources, as this will help to increase employment in Europe and decrease resource use while incentivising businesses to move towards circular production and consumption patterns. Reduced taxes or tax allowances for repair, reuse and refurbishment businesses, and increased taxes on single-use and hard-to-recycle materials are a way to implement this.

In addition, the European Commission should explore the effects, impacts and options of extending minimum legal product warranties. This would oblige manufacturers to bear full responsibility for any product failure during a legally determined period after purchase.

Economic instruments such as incineration and landfill taxes are needed in order to move up the waste hierarchy. Burning and landfilling recyclable or compostable materials should be banned. Public funding, including public procurement and the €300bn Juncker investment plan should be used to fund prevention, reuse and recycling infrastructure as a priority. Deposit and refund schemes are useful for educating citizens on the value of recycling, as well as ensuring the collection of commonly littered items such as beverage bottles, and can be integrated within extended producer responsibility schemes.

Overarching benefits of working on the four pillars

Economic Savings

The circular economy will help reduce costs related to extracting and transporting virgin resources. This will also reduce business resource costs; for example, the EU manufacturing sector could save up to \$630 billion per year by 2025 thanks to resource-efficiency measures.⁵

The full implementation of existing EU waste legislation would save €72 billion a year by 2020,⁶ and the waste package presented in July 2014 has the potential to increase these numbers significantly.

Job creation

Full implementation of existing EU waste legislation would create over 400,000 jobs.⁷ The waste package presented by the European Commission in July 2014 was estimated to create an additional 180,000 direct non-delocalizable jobs by 2030.⁸ The thorough implementation of the other three pillars discussed here could increase these numbers significantly.

A shift from taxing labour to taxing resources will lead to reduced labour costs for the employer and/or higher take-home pay for the employee.

The significant investments necessary for creating incineration infrastructure could instead be redirected to developing re-use centres and networks, recycling infrastructure and renewable energy, all of which require more, better quality jobs than incineration and landfilling.

Energy Savings

The circular economy will reduce the energy required for extraction of virgin materials and production. Processes that use secondary raw materials consume considerably less energy than manufacturing from virgin materials. For example, remanufacturing typically uses 85% less energy than manufacturing does.⁹ More durable and reusable products and materials will result in longer life-cycles and better retention of the embedded energy of products. Further, this will reduce the need to extract and produce new materials and products, resulting in radical energy savings in extraction and production. As a result, the EU will save energy, increase resource efficiency and will reduce its import dependence on energy from third countries.

Resource Savings

Reuse of products and materials saves a considerable proportion of the resources needed to manufacture goods from virgin materials. For example, UK analysis suggests that remanufacturing saves at least 70% of materials compared to manufacturing new goods.¹⁰

⁵ McKinsey & Company, Remaking the industrial economy, 2014.

⁶ Bio Intelligence Service for European Commission DG Environment, Implementing EU Waste Legislation for Green Growth, 2011.

⁷ Commission Staff Working Document (SWD/2014/0207 final), Impact assessment accompanying the document Proposal for reviewing the European waste management targets.

⁸ Commission Staff Working Document (SWD/2014/0207 final), Impact assessment accompanying the document Proposal for reviewing the European waste management targets.

⁹ KTN, Supporting Excellence in UK Remanufacturing, 2014.

¹⁰ Next Manufacturing Revolution, The Next Manufacturing Revolution: Non-Labour Resource Productivity and its Potential for UK Manufacturing, 2013.

Climate Change Mitigation

The Circular Economy will represent a significant step towards a low-carbon, resource-efficient economy, advancing towards the EU's objective for 2050.

The waste package presented by the European Commission in July 2014 was estimated to have the potential to reduce emissions by 443 million tonnes of greenhouse gas between 2014 and 2030,¹¹ without taking into account the further changes discussed here.

Health & Well-being

Reducing hazardous chemicals in production and in products will consequently reduce the impact on human health caused by close daily contact, or from indirect exposure from emissions into the environment.

Eliminating wherever possible toxic materials at the design stage will make it easier to safely and efficiently reuse, repair and recycle those products.

Europeans will benefit from avoiding emissions caused by burning and burying waste. A reduction in crop loss, respiratory and skin diseases, infertility, certain cancers, metabolic diseases and neurological/mental health issues will result. A recent study of the health costs of certain toxic chemicals estimated an annual cost to the European Union of approximately €157 billion per year¹² and noted that this was an underestimate as only some chemicals and some diseases were included.

Reduction in marine litter

80% of marine litter results from land-based activities¹³ and is a consequence of unsustainable production patterns and poor waste management. Marine litter also represents a threat to human and ecosystem health, as plastic particles are known to bioaccumulate up the food chain, and carry dangerous pathogens across oceans to new areas.

Turning our economy into a circular economy is the ultimate solution to this problem. A significant reduction in marine litter will bring about a multitude of benefits. The annual costs from marine litter in Europe have been estimated at between €259 to 694.7 million for the fisheries, tourism and recreation sectors, as well as clean-up costs for coastal municipalities. Less waste in the sea means less marine animals and birds suffering entanglement or ingestion of litter, representing savings of around €12 billion each year.¹⁴

The costs to the marine environment from marine litter cannot be fully quantified, but considering waste has been found in the bodies of hundreds of species, and the remotest corners of the marine environment, urgent action must be taken to prevent the problem from getting worse.

Stability of supply

Improvement of resource efficiency, by measuring and reducing our material, land, water and carbon footprints will result in member states being less dependent on imports.

¹¹ Commission Staff Working Document (SWD/2014/0207 final), Impact assessment accompanying the document Proposal for reviewing the European waste management targets.

¹² Trasande et al, Estimating Burden and Disease Costs of Exposure to Endocrine Disrupting Chemicals in the European Union, *Journal of Clinical Endocrinology and Metabolism*, 2015 Apr;100(4):1245-55.

¹³ GESAMP, *The State of the marine environment*, 1991.

¹⁴ Arcadis for European Commission DG Environment, *Marine Litter study to support the establishment of an initial quantitative headline reduction target*, 2014.

The EU could also benefit from improved trade balance due to reduced imports. The Waste and Resources Action Plan estimates them as €110 billion.¹⁵

Greater security in resource supply, and reduced land and water consumption outside our borders, can lead to improved geopolitical relations across the world.

Agriculture

Closing the nutrients loop would allow vital components such as nitrogen, phosphorous and potassium to return to the soil in the form of compost, effectively capturing carbon and improving crop resilience, along with increasing the water retention capacity of the soil.

Pesticide-free agriculture would allow for job creation, energy savings and potential health benefits.

Conclusion

Taking ambitious steps towards a circular economy would reduce Europe's use of materials and energy, decrease the amount of hazardous chemicals entering our environment, and ensure a multitude of economic benefits while creating locally-based, stable employment for thousands of Europeans. A circular economy in which we not only use resources and energy more efficiently, but also consume less in total, will benefit the environment and reduce the European Union's import dependency along with the likely threat of price shocks in the future.

Many of these ambitious steps are achievable in the short-term, and the sooner they are implemented, the greater the benefits will be. Any of these benefits would be enough on their own to commend a policy, but the positive, cumulative effects of each of these changes will be multiplied. Improving our material management will lead to greater energy efficiency, as well as economic, environmental and social benefits for European communities. The EU must not hesitate to spearhead the transition to a circular economy, for the benefit of both people and planet.

¹⁵ WRAP, <http://www.wrap.org.uk/content/wrap-outlines-%C2%A3330bn-economic-growth-potential-eu-smarter-resource-use> 2013.