

## COMMISSION INTERNAL

### Closing the loop – An EU action plan for the circular economy

#### Introduction

A transition towards a circular economy responds to some of the main challenges of our time. It can help preserve resources that are increasingly scarce and subject to mounting environmental pressure and volatile prices. It can boost our economy and competitiveness by bringing new business opportunities as well as innovative and more efficient ways of producing and consuming. It can bring local low and high-skilled jobs and create opportunities for social integration and cohesion. This transition gives us an opportunity to reinvent our economy and create new competitive advantages for Europe on a sustainable basis. EU action on the circular economy is in fact closely linked with a number of other EU agendas, including sustainability, jobs and growth, climate and energy, as well as the social agenda and industrial policy.

The European Union will play a key role in supporting this transition. The aim should be to give clear signals to our economy and society on the way forward. Europe can act to drive investments and create a level playing field, to remove obstacles stemming from European legislation, to deepen the single market, and to provide favourable conditions for innovation and for the involvement of all stakeholders.

This Action Plan therefore establishes a concrete and ambitious programme of action, with measures that either are adopted together with this Communication or will be carried out during the mandate of this Commission. These include in particular key legislative proposals on waste, fertilisers, and water reuse; strong commitments on Ecodesign; the development of strategic approaches on plastics and on chemicals; a major initiative to fund innovative projects under the umbrella of Horizon 2020; as well as targeted action in areas such as food waste, critical raw materials, industrial and mining waste, consumption, public procurement, and others. The actions proposed promote and support the circular economy in each step of the value chain– from production to consumption, waste management, and secondary raw materials which are re-injected into the economy. It then sets out action for specific sectors, where an integrated approach is needed; and for horizontal enablers such as innovation or financing.

This Action Plan focusses on areas where action at EU level will have the highest impact and make most sense. Making circular economy a reality will require long-term involvement at all levels, from Member States, regions and cities, to businesses, citizens and consumers. The circular economy will also need to develop as globally, and recent events like the adoption of Sustainable Development Goals for 2030 or the G7 Alliance on Resource Efficiency show the potential of international cooperation.

The objective of a circular economy is to preserve and maintain the value of products and materials in the economy for as long as possible, while reducing the excessive consumption of primary resources as well as minimising the generation of non-recyclable waste.

## **1. Production**

A circular economy starts at the very beginning of a product's life. Both the design phase and the production processes have an impact in terms of resource use and waste generation throughout a product's life.

### **1.1. Product design**

The way a product is designed can influence considerably its future life and contribution to a circular economy. Better product design can benefit consumers by making products more durable or easier to repair. It can help recyclers to disassemble products in order to recuperate valuable materials. It can overall help to save resources that are precious to our environment and our economy. However, market signals are often not sufficient to make this happen, in particular because the interests of producers, users and recyclers are not aligned. It is therefore essential to promote and incentivise improved product design, while at the same time preserving the internal market and enabling innovation.

Electrical and electronic products are particularly significant when it comes to better design. Their reparability is important to consumers, and they can contain key materials that should be made easier to recycle (for example rare earth in electronic devices). In order to promote a better design of these products, the Commission is committed to emphasising circular economy aspects when setting future product design requirements under the Ecodesign directive<sup>1</sup>. So far, Ecodesign requirements have mainly concerned energy efficiency; in the future issues such as reparability, durability, recyclability, or the identification of certain materials or substances will be systematically examined, taking into account the specificities and challenges of different product groups.

As a first step, [*text to be adapted when the draft implementing regulation is adopted*: the Commission has recently developed and proposed to Member States mandatory product design requirements for electronic displays (e.g. flat computer or television screens), which will make it easier and safer to dismantle them for recycling, among other benefits ]

The Commission is also proposing to encourage better product design by differentiating the financial contribution of producers to the end-of-life treatment of their products (through Extended Producer Responsibility schemes) depending on the end-of-life (including recyclability) of their products.

---

<sup>1</sup> 2009/125/EC. This directive covers all energy-related products.

*- The Commission commits to develop product requirements relevant to the circular economy in its future work under the Ecodesign directive, as appropriate and taking into account the specificities of different product groups. As a first step, the Commission is adopting as part of the Circular Economy Package an Ecodesign working plan for 2015-2017 where it will elaborate further on how this could be implemented.*

*- The Commission is also adopting (in the revised legislative proposal on waste) a proposal to differentiate fees paid by producers in Extended Producer Responsibility schemes according to the real end-of-life costs and recyclability of their products*

### **1.1. Production processes**

Even for products or materials designed in a smart way, production processes can lead to significant waste generation or inefficient use of resources.

Primary raw materials will continue to play a role for production processes even in a circular economy. These materials can have detrimental environmental impacts, both in the EU and in third countries. The Commission is continuously working to promote sustainable sourcing of raw materials, both in the EU and in third countries, for example through policy dialogues, partnerships, as well as trade<sup>2</sup> and development policy. Existing areas of action include avoiding the use of illegally logged timber<sup>3</sup> or raw materials that contributed to armed conflicts<sup>4</sup>. The role of the industry in making concrete commitments to sustainable sourcing and cooperating across industry value chains is also crucial.

In order to improve production processes as such, a "one size fits all" approach would not work: each industry branch is different when it comes to resource use, waste generation and waste management. Therefore, the Commission will examine best practices in a range of industrial sectors, and include relevant elements in the best available technique reference documents or "BREFs" that Member States have to reflect when issuing permitting requirements for industrial installations. The Commission will also issue guidance and promote best practices on mining waste. The Commission is also supporting SMEs in developing more efficient processes with the creation of the European Resource Efficiency Excellence Centre, and will examine how to improve the efficiency and uptake of the EU Eco-Management and Audit Scheme (EMAS) and the environmental technology verification system.

In addition to best practices, it is important to promote innovative industrial processes that contribute to a circular economy. For example, industrial symbiosis allows waste or by-products of an industry to become raw materials for another one. By clarifying the definition of by-products in its revised proposal on waste, the Commission will facilitate this practice. Remanufacturing is another area that has potential to develop in support of a circular economy: it is already common practice in certain industries, such as vehicles or industrial

---

<sup>2</sup> In particular the "Trade and investment for all" strategy adopted in October 2015

<sup>3</sup> Timber regulation; FLEGT agreements [ENV to complete]

<sup>4</sup> COM(2014) 111

machinery but could be applied to new sectors. The EU is supporting these promising developments through its research and innovation financing programme, Horizon 2020<sup>5</sup>, as well as through Cohesion Policy funds.

- *As part of the regular reviews of Best Available Techniques reference documents (BREFs) the Commission will include guidance on best waste management and resource efficiency practices for production processes in industrial sectors. The Commission will also issue guidance and promote best practices on mining waste.*
- *The Commission will examine how to improve the efficiency and uptake of the EU Eco-Management and Audit Scheme (EMAS) and the environmental technology verification system.*
- *The Commission is proposing (in the revised legislative proposal on waste) to clarify the definition of by-products, which will facilitate industrial symbiosis*

## **2. Consumption**

The consumption phase relies on millions of consumers who make choices that can support or hamper the circular economy. These choices can be strongly limited or influenced by the information consumers have access to, as well as by the array of existing products and their prices, and the existing regulatory framework. The consumption phase is also crucial to reduce the amount of waste generated by households.

According to a recent survey, a majority of EU consumers prefers products that are environmentally friendly<sup>6</sup>. However, faced with a profusion of labels or environmental claims, they often find it difficult to differentiate between products and to trust the information available. The Commission is working to make green claims more trustworthy, in particular by giving better guidance on commercial practices, and will continue in this direction. The EU Ecolabel is a voluntary label that applies to a wider range of product categories, and is a way to identify the products that have a reduced environmental impact throughout their lifecycle. The Commission will examine how to improve its efficiency.

The Commission has also proposed, earlier this year, an improved labelling system for the energy consumption of household appliances that will help consumers to choose the best performing products<sup>7</sup>.

The price of products is also a factor that influences consumers. Member States can provide incentives and better reflect the environmental costs of products in their price through the use of economic instruments.

---

<sup>5</sup> Call for Factories of the Future, 2014 – call on industrial symbiosis, 2014

<sup>6</sup> Eurobarometer [http://ec.europa.eu/public\\_opinion/flash/fl\\_367\\_en.pdf](http://ec.europa.eu/public_opinion/flash/fl_367_en.pdf)

<sup>7</sup> Ref to Energy labelling proposal

Guarantees are an important part of the consumption puzzle, as they can protect consumers against defective products which would then be thrown away. A mandatory two year guarantee exists in the EU for all physical goods; however problems are still encountered in its implementation. The Commission is currently working to make sure that these problems are solved. It is also developing harmonised rules for online purchases<sup>8</sup>. In addition, the Commission is revising the legislation that governs guarantees, and will examine closely how to improve the existing system in the future.

Once a product has been purchased, its lifetime can be increased if it is reused, and repaired when needed, hence avoiding unnecessary wastage. The reuse and repairs sectors are work-intensive, and can contribute effectively to the EU agenda on jobs and growth as well as to its social agenda. Currently, certain products cannot be repaired because of their design, or because spare parts or repair information is not available. Future work on the Ecodesign of products (see section 1.1) will contribute to making products easier to repair: in particular, requirements concerning the availability of repair information (e.g. through repair manuals) and of spare parts will be specifically considered. The Commission will also analyse the costs and benefits of introducing a horizontal measure on repair information provision in the context of Ecodesign. In addition, the revised legislative proposal on waste promotes reuse, notably by taking into account certain reuse activities under the EU waste targets and facilitating the access of reuse centres to discarded products. The role of Member States and regional and local authorities is also important in encouraging reuse and repair on their territory, and initiatives are already being developed in this direction.

In addition to repair, reuse, and durability of products, other actions can be taken to reduce the amount of waste produced by households. Often they are more effective when taken at national and local level, where they can be better targeted: awareness campaigns and economic incentives (such as incentive systems for municipalities or "pay as you throw" schemes, where e.g. households pay in proportion of the amount of non-recyclable waste that they throw away) have shown to be particularly effective. The Commission is also promoting waste prevention through exchange of information and best practices and by supporting projects at regional level through Cohesion Policy funds.

Innovative ways of consuming can also support the development of the circular economy, for example by sharing products or infrastructure (collaborative economy), consuming services rather than products (for example through leasing contracts), or making use of information technologies or digital platforms. This can help to lengthen the life of products, give incentives to use them more efficiently, maintain, repair and reuse them, and in some cases avoid waste generation. These new ways of consuming are often developed by businesses or citizens, and promoted at national and local level. [If relevant add references to internal market strategy] The Commission supports these new business and consumption models through its research and innovation funding programme Horizon 2020 (see also section 6).

---

<sup>8</sup> Reference to be added – DG JUST

Public procurement represents a large share of European consumption, with nearly 20% of EU GDP. It can therefore have a large impact if choices are made that support the circular economy. Public authorities are already explicitly allowed to take into account full lifecycle costs, including cost of resources and of end-of-life treatment, in their tenders<sup>9</sup>. The Commission is also developing voluntary criteria for Green Public Procurement and will in the future put a specific emphasis on aspects relevant to the circular economy, such as durability or reparability, when setting out new criteria or revising them. Public authorities then have a key role to play in ensuring that these criteria are applied, where relevant, when launching public tenders. The Commission will provide support to national, regional and local authorities in this respect, including by developing training schemes. The Commission will also reflect on how Green Public Procurement could be used more widely across the EU, in particular for products or markets that can have high environmental impacts and relevance for the circular economy. Finally, the Commission will take action to reinforce the use of Green Public Procurement in EU funding.

- *The Commission will specifically consider requirements on availability of repair information (e.g. through repair manuals) and of spare parts in its work on Ecodesign (see section 1.1), and will analyse the cost and benefits of horizontal measures on the provision of repair information under Ecodesign.*
- *In the revised waste proposal, the Commission foresees rewards for the promotion of certain reuse activities at national level and improved market access for reuse centres*
- *The Commission will examine how to improve voluntary labelling of products through the EU Ecolabel, as well as how to use its work on Product Environmental Footprint to communicate environmental information.*
- *The Commission will work towards better enforcement of the guarantee on tangible products and examine possible options for its improvement, as well as continue its action to tackle false green claims.*
- *The Commission will enhance the integration of circular economy aspects in Green Public Procurement criteria developed or reviewed, and will examine ways to increase their uptake. The Commission will also take action to reinforce the use of Green Public Procurement in EU funding.*

### **3. Waste management**

Waste management is a central part of the circular economy: the way we collect and manage our waste can lead either to high rates of recycling and to valuable materials finding their way back into the economy, or to an inefficient system where most of the waste ends in landfills, with harmful environmental impacts and significant economic loss. In order to make sure that the first scenario is pursued, it is essential to set long term signals that will guide public authorities, businesses and investors, and to set the right enabling conditions at EU level. All waste should be considered: waste generated by household, businesses, industry and mining,

---

<sup>9</sup> As stated in the recent legislation on public procurement (Directive 2014/24/EU)

and the construction sector (see in particular section 1.2 on waste from industry and mining, and section 5.4 on the construction sector).

Currently, in the EU, around 40% of the waste produced by households is recycled. This average masks a high discrepancy between Member States and regions, with rates as high as 70% in certain areas, and lower than 5% in others.

[text to be added on the municipal waste targets/landfill action depending on outcome of political discussion.]

The level of recycling of packaging waste has improved in the EU following the introduction of EU wide targets for paper, glass, plastics, metal, and wood packaging<sup>10</sup>, and there is still potential to increase these recycling rates with both economic and environmental benefits. Packaging waste comes both from households and from industrial and commercial sources; the differences in recycling levels between Member States are also less marked than for household waste. The revised waste proposal includes increased recycling targets for the five packaging materials, which will reinforce the targets on municipal waste and also improve the management of packaging waste in the commercial and industrial sectors.

In order to increase levels of high quality recycling, waste collection and sorting need to gradually improve. A requirement for separate collection already exists in the EU for certain materials<sup>11</sup>; in addition the Commission emphasises the need for separate collection of bio-waste in its revised proposal on waste. The financing of collection and sorting systems is often covered in part by Extended Producer Responsibility schemes, operating at national or regional level, in which manufacturers are responsible for the costs of collection and treatment of their products. In order to enhance the effectiveness of these schemes, the Commission is proposing minimum conditions to be respected when such schemes are set in place so that their transparency and cost efficiency is improved. Extended producer responsibility schemes can also be used by Member States or regions for additional waste streams such as textiles or furniture.

The revised proposal will also address key issues relating to the way recycling rates are calculated. This is essential to ensure harmonisation across the EU, quality of statistics, and to simplify the current system.

In addition to setting long term targets for recycling [and landfill action], it is important to make sure that obstacles on the ground are addressed. Often, barriers to higher recycling rates concern administrative capacity, lack of investments and insufficient use of economic instruments (such as charges for landfilling or pay-as-you-throw schemes). Best practices and experiences from countries and regions that have successfully improved their waste management can be shared to help where recycling rates are still low. The Commission is committed to facilitating this exchange of best practices and to providing assistance to make

---

<sup>10</sup> Reference to packaging waste directive

<sup>11</sup> Plastics, paper, metals and glass

changes happen on the ground. Close cooperation with Member States on these issues has already started and will continue in the future. [Add text on elements of waste proposal as appropriate]

European cohesion funding has a role to play in terms of closing the investment gap for improved waste management and supporting the application of the waste hierarchy. In the past two decades, these funds have been used widely across the EU to develop waste management infrastructure. For the current financing programme (2014-2020), strict conditionality rules are in place to ensure that new investments in the waste sector are in line with waste management plans designed by Member States to meet their recycling targets. In practice, this means that funding of new landfill will only be granted in exceptional cases (for example for specific streams of hazardous waste), and that funding of new facilities for treatment of residual waste, such as incineration, will take place in a limited and well justified number of cases, which avoid the risk of overcapacity and where the objectives of the waste hierarchy are respected.

Another barrier to higher recycling rates is the illegal transport of waste, both within the EU and towards third countries. It often results in economically sub-optimal and environmentally unsound treatment. In order to curb this phenomenon, it is important to facilitate the work of the authorities in monitoring and detecting illegal waste shipment, and the Commission will take measures to that effect.

In addition, in order to foster high-quality recycling in the EU and third countries, the Commission will promote the voluntary certification of treatment facilities for certain key types of waste (such as electronic waste or plastics).

When waste cannot be prevented, reused or recycled, recovering its energy content through combustion is in most cases more favourable than landfilling it, both from an environmental and economic perspective. "Waste to energy" can therefore play a role, both within the waste hierarchy and for our energy policy. This role should be examined to see under which conditions it can be optimised so that it does not have negative impacts on the transition towards higher recycling rates, and how the corresponding energy potential can best be exploited. For that reason the Commission will adopt an initiative on waste to energy in the framework of the Energy Union.

*The Commission is adopting, together with this action plan, a revised legislative proposal on waste comprising in particular:*

- long-term recycling targets for municipal and packaging waste;*
  - [action on landfill];*
  - general requirements for Extended Producer Responsibility schemes*
  - simplification and harmonisation of definitions and calculation methods*
- The Commission is committing to continue to work in close cooperation with Member States for the achievement of waste management targets on the ground.*



- *The Commission will adopt measures to allow for improved identification of illegal waste shipment and will promote voluntary certification of treatment facilities for key waste streams.*
- *The Commission will adopt an initiative on waste to energy in the framework of the Energy Union.*

#### **4. From waste to resources: boosting the market for secondary raw materials**

In a circular economy, materials that are suited for recycling are injected back into the economy and become new raw materials. These are often referred to as "secondary raw materials", which can be traded and shipped just like primary raw materials from traditional extractive resources.

At present, however secondary raw materials still account for a small proportion of the materials used in the EU<sup>12</sup>. Waste management practices (including collection, sorting and pre-treatment) have a direct impact on the quantity and quality of these materials and therefore actions to improve these practices are crucial (see section 3.). However, a number of other barriers hamper the development of this important market and the smooth circulation of the materials. It is an area where EU action is particularly important given the implications in terms of single market and the links with existing EU legislation.

One of the barriers faced by operators who want to trade secondary raw materials is uncertainty regarding their quality. In the absence of EU-wide standards, it can be difficult to ascertain levels of impurities, or suitability for high-grade recycling (for example for plastics). The development of such standards will help build trust in secondary raw materials, as well as in recycled materials and products, and contribute to support the market. The Commission will therefore launch work on developing EU-wide quality standards for secondary raw materials where these are needed, in collaboration with the industries concerned.

Recycled nutrients are a specific and important category of secondary raw materials, where the development of quality standards is also a necessity. Recycled nutrients are present for example in organic waste material and can be returned to soils as fertilisers. Their use in agriculture reduces the need for mineral-based fertilisers, the production of which causes negative environmental impacts, and depends on import of phosphate rock, a limited resource. However, currently the circulation of fertilisers based on recycled nutrients is hampered by differing rules and quality standards across Member States. In order to address this situation, the Commission is proposing, together with this action plan, a revision of the EU regulation on fertilisers. It will contain new measures to facilitate the EU wide recognition of organic and waste-based fertilisers, therefore helping the development of an EU-wide market for these products.

---

<sup>12</sup> With some exceptions such as steel or paper

Another way of recycling nutrients for use in agriculture is through the reuse of treated wastewater for irrigation in certain conditions. This waste water can be rich in nutrients such as phosphorus and nitrogen and therefore decrease the need for solid fertilisers. Reuse of treated water is also a way to recharge depleted aquifers. The Commission will propose targeted actions to promote safe and cost-effective water reuse, including legislation on minimum requirements for water reuse for irrigation.

Another very important question for the development of secondary raw materials concerns the link with legislation on hazardous chemicals. In response to safety concerns for citizens and to new scientific evidence, a growing number of chemical substances are identified as serious concerns for health and the environment and become subject to restrictions or prohibitions at EU level in new products or materials. These substances are however still present in products that were sold before the restrictions applied, some of them with a long lifetime, and these products eventually find their way to waste management facilities and sometimes into recycled materials. Such substances can be very costly to detect or remove; and the way EU legislation on chemicals applies to manufacturers can sometimes be too heavy for recyclers, most of which are SMEs. On the other hand, recycled products must not present a higher risk to health and the environment than virgin materials, including for the people working in recycling facilities.

These issues must be assessed very carefully in order to decide for the right course of action at EU level, to on the one hand avoid unacceptable exposure to problematic substances, and on the other hand limit unnecessary burden for recyclers and facilitate the traceability and risk management of chemicals through their lifecycle. For this reason, the Commission will develop analysis and options for action on these different questions, taking into account the interaction between product, waste and chemical legislation.

A key factor in creating a dynamic market for secondary raw materials is sufficient demand from economic actors, driven by the use of recycled materials in products and infrastructure. For certain raw materials, such as paper or metal, the demand is already high; for others it is still developing. The role of the private sector in creating this demand and helping to shape supply chains and market mechanisms will be essential; already a number of industrial and economic actors have made public commitment for a level of recycled content in products they put on the market. Public authorities can also contribute to the demand for recycled materials through their procurement policies. This is an area where prescriptive EU action would not be effective or proportionate.

It is also essential to facilitate the cross-border circulation of secondary raw materials to ensure that they can easily be traded across the EU. Action in this domain will include the simplification of cross-border formalities through the use of electronic data exchange. The Commission is also examining other barriers that can hamper the smooth circulation of waste in the EU, and might propose further action. Finally, the Commission will help improve the available data on secondary raw materials through a Raw Materials Information System.

- *The Commission will launch work to develop quality standards for secondary raw materials where they are needed (in particular for plastics)*
- *The Commission is adopting with this package a proposal to revise the EU regulation on fertilisers, in order to facilitate recognition of organic and waste-based fertilisers in the single market, hence supporting the role of bio-nutrients in the circular economy.*
- *The Commission will also take action to facilitate water reuse, including with a legislative proposal providing clear guidance and minimum requirements for reused water e.g. for irrigation and groundwater recharge*
- *The Commission will develop analysis and policy options to examine how to address the interface between chemicals, products and waste legislation, including on how to improve the tracking of chemicals of concern in products*
- *The Commission will adopt measures to facilitate shipment of secondary raw material across the EU (electronic data exchange and possible other measures), and improve data availability on raw materials.*

## **5. Sectorial actions**

A number of key sectors which face specific challenges in the context of the circular economy need to be addressed in a targeted way, looking at the whole cycle, in order to ensure that the interactions and synergies between the different phases are fully taken into account.

### **5.1. Plastics**

While the use of plastics has been steadily growing in the European Union, less than 25% of the plastic waste collected is recycled, and about 50% goes to landfill. Large quantities of plastics also end up in the oceans. Increasing plastic recycling is essential for the transition to a circular economy, yet poses particular challenges linked for example to the existence of different kinds of plastics (polymers) that need to be treated separately or to the presence of hazardous chemical additives. Innovative types of plastics are also emerging and this raises new questions, for example as regards plastics biodegradability.

In order to address this complex and important issue, the Commission will prepare a strategy which will examine the challenges posed by plastics throughout the value chain<sup>13</sup>. A number of other elements of this action plan will also help to increase plastics recycling, including Ecodesign (section 1.1), an EU-wide target on recycling of plastic packaging (section 3), quality standards and action to facilitate cross-border trade of recyclable plastics (section 4).

- *The Commission will adopt a strategy on plastics in the circular economy, addressing issues such as recyclability, biodegradability, the presence of hazardous substances of concern in certain plastics, and the prevention of marine litter*

<sup>13</sup> This strategy will include a follow-up to the Green Paper on plastic waste (reference)

*- The Commission is proposing, in the revised legislative proposal on waste, a target of X% recycling of plastic packaging by 2025 and Y% by 2030 in the EU.*

## 5.2. Food waste

Food waste is becoming an increasing concern in Europe, for citizens and economic actors. The production, distribution and storage of food use natural resources and can cause significant greenhouse gas emissions and other environmental impacts. Discarding food that is still edible increases these impacts, and causes financial loss for both consumers and the economy as a whole. Food waste also has an important social angle: for example, food donation of food that is still edible but that for logistic or marketing reasons cannot be commercialised should be facilitated. World Heads of State adopted in September 2015, as part of the Sustainable Development Goals for 2030, an objective to halve per capita food waste at the retail and consumer level, and reduce food losses along production and supply chains. Europe will have to play its part.

Food waste can take place during production and distribution, in shops, and at the consumers' level, in homes, restaurants and catering facilities. Preventing food waste therefore involves many different actors, with specific challenges across regions or sectors. Food waste is also particularly difficult to measure because of its cross value-chain nature. Today, there is no harmonised, reliable method to measure food waste in the EU, which makes it more difficult for public authorities to assess its magnitude, sources, and evolution over time. Addressing this problem is a first essential step towards a better understanding of the issue and its complexities: for this reason, the Commission is proposing the elaboration of a common EU methodology to measure food waste and guide future policy decisions.

Action at EU level to prevent food waste is particularly important in areas where unnecessary wastage can happen as a result of the way EU legislation is interpreted or implemented. This is the case for the rules concerning food donation to food banks, and for the reuse of food as animal feed – therefore the Commission will take measures in these two areas. Another area where action might be needed concerns the date marking of food for consumers, and in particular the "best before" date. This label can sometimes be wrongly interpreted as an expiry date and lead to discarding of edible food. The Commission will therefore examine ways to promote a better use and understanding of date marking for consumers. The EU is also active to avoid that edible fish is thrown back into the sea during fishing operations<sup>14</sup>.

Action by Member States, regions, cities, and business along the value chain is also essential to avoid food waste. Situations vary significantly across Member States and regions in terms of consumers' behaviours and organisation of the food chain, hence requiring specific approaches. While the EU deploys funding to promote reduction of food waste<sup>15</sup> and

<sup>14</sup> article 15 of the Common Fisheries Policy, Reg 1380/2013

<sup>15</sup> References: horizon 2020 project

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2112-waste-2-2014.html> and support from the European Maritime and Fisheries Fund

organises exchange of best practices, a number of measures are more efficient if they are taken at national or regional level. Awareness campaigns have shown to be effective to change behaviours; these can take place both at EU and national level<sup>16</sup>. Actors in the agro-food industries have also shown voluntary commitments to reduce wastage of food in the production process.

- *The Commission is proposing a common EU methodology and indicator to measure food waste*
- *The Commission will take measures to clarify EU legislation relating to waste, food and feed and facilitate food donation as well as the reuse of former foodstuff as feed.*
- *The Commission will examine ways to improve the use and understanding of date marking for consumers, in particular the "best before" label.*

### 5.3. Critical raw materials

Critical raw materials are materials that combine high economic importance for the EU and risk of disruption of supply<sup>17</sup>; in certain cases, their extraction also causes significant environmental impacts. They are often present in electronic devices<sup>18</sup>. Currently the rate of recycling of these materials is very low, causing the loss of significant economic opportunities. When electronic devices end up in landfills, risks to health and the environment can also ensue. For all these reasons, increasing the recovery of critical raw materials is one of the challenges that must be addressed to move towards a more circular economy.

Recycling of electronic waste is already encouraged through existing EU legislation, including through mandatory targets<sup>19</sup>; however only high quality recycling ensures the actual recovery of critical raw materials. One of the barriers to such high quality recycling is the difficulty to collect, dismantle and recycle the products that contain critical raw materials. It will therefore be essential to encourage a better recyclability of electronic devices through product design (see section 1.1), hence improving the economic viability of the recycling process. The Commission is also encouraging Member States to promote recycling of critical raw materials in its revised proposal on waste.

Other barriers to recycling include insufficient information exchange between manufacturers and recyclers of electronic products, absence of recycling standards, or lack of data for economic operators on the existing potential for recycled critical raw materials. Critical raw materials could also be recovered in landfills (for example in old electronic devices that were discarded) or in certain cases from mining waste. The Commission is developing research and innovation programmes, data and information exchange, and will promote best practices on

---

<sup>16</sup> The EU is running awareness campaigns: SANTE to add references

<sup>17</sup> The European Commission has listed critical raw materials here: [http://ec.europa.eu/enterprise/policies/raw-materials/critical/index\\_en.htm](http://ec.europa.eu/enterprise/policies/raw-materials/critical/index_en.htm). They include, for example, rare earth elements and other precious metals, but also phosphorus.

<sup>18</sup> Such as rare earths in electronic displays or precious metals in printed circuit boards

<sup>19</sup> Reference to WEEE directive

all these issues. In order to gather the results of this analysis and to identify options for further action to support the uptake of critical raw materials recycling, the Commission will prepare a report on critical raw materials in the circular economy.

- *The Commission will produce a report on critical raw materials including best practices and options for further action.*
- *The Commission will encourage further recovery of critical raw materials through better product design (see section 1.1), standards for optimised recovery, better information exchange between manufacturers and recyclers for electrical and electronic products, research and innovation and exchange of best practices. The Commission is also encouraging action from Member States on this topic in its revised proposal on waste.*

#### **5.4. Construction and demolition**

Waste originating from construction and demolition represents one of the highest volumes of waste in Europe. Many of the materials originating from this waste stream are recyclable or can be reused; however reuse and recycling rates vary a lot across the EU. The construction sector also plays a role in the environmental performance of buildings through their life. This sector as a whole can have significant impacts on the circular economy.

Recycling of construction and demolition waste is encouraged by an EU-wide mandatory target<sup>20</sup>, however challenges still exist on the ground to improve the quality of waste management in this sector. For example, valuable materials are not always identified or adequately recovered. The Commission will therefore develop guidelines to be used on demolition sites for this purpose, also ensuring proper treatment of hazardous waste. The Commission will also help to spread best practices by developing voluntary recycling protocols based on the highest common standards for each waste stream.

Given the long lifetime of buildings, it is also essential to encourage an improved design which will reduce the environmental impacts of buildings and increase the recyclability of their components. The Commission will therefore develop indicators to assess the environmental performance throughout the full lifecycle of a building, and promote their use for building projects through large demonstration projects and guidance for green public procurement.

- *The Commission will develop pre-demolition guidelines to ensure adequate recovery of valuable resources and proper management of hazardous waste, as well as voluntary industry-wide recycling protocols, based on the highest common standards in each waste stream.*
- *The Commission will develop a set of core indicators for the assessment of the lifecycle environmental performance of a building, and incentivise the use of these indicators.*

---

<sup>20</sup> reference

## 5.5. Biomass and bio-based products

Materials based on biological resources (such as wood, crops or fibres) can be used for a wide range of products (construction, furniture, paper, food, textile, chemicals,..) as well as energy uses. They can replace fossil-based alternatives, or present advantages linked to their biodegradability or compostability. In the case of wood in particular, reuse and recycling can take place several times, hence increasing the value of the material through multiple uses. On the other hand, in some cases the production of these materials raises issues in terms of greenhouse gas emissions and other environmental impacts. The multiple possibilities for their use can also generate competition for these resources and create pressure on land-use.

From the perspective of the circular economy, it is important to promote as far as possible a cascading use of renewable resources, with several reuse and recycling cycles, together with the application of the waste hierarchy (including for food: see section 5.3). Practices at national level such as extended producer responsibility schemes for furniture or wood packaging, or separate collection for wood can have a positive impact. The Commission will work on identifying and sharing best practices in this sector as well as promoting innovation; the revised legislative proposal on waste also includes [tbc: the promotion of the separate collection of wood and] a mandatory EU-level target on recycling wood packaging. In addition, the Commission will take into account the compatibility with the circular economy when examining the sustainability of bioenergy under the Energy Union.

The bio-based sector has also shown its potential for innovation in new materials, chemicals and processes, which can be beneficial for the circular economy. The EU is supporting innovative bioeconomy-based projects through research funding<sup>21</sup>.

- *The Commission will prepare guidance with a view to sharing good practices between Member States and stakeholders on the cascading use of biomass; the Commission will also promote innovation in this domain through research funding.*
- *The Commission will also take into account the compatibility with the circular economy when examining the sustainability of bioenergy under the Energy Union.*
- *The Commission is proposing, in the revised legislative proposal on waste, [tbc – separate collection of wood] and a target of X% recycling of wood packaging by 2025 and Y% by 2030 in the EU*

## 6. Horizontal flanking measures

The transition to a circular economy is a systemic change. In addition to targeted actions affecting each phase of the value chain and key sectors, it is necessary to create the conditions under which a circular economy can flourish and resources can be mobilized.

---

<sup>21</sup> RTD to insert reference

Innovation will play a key part in this systemic change. In order to rethink our way of producing and consuming, we will need new technologies, processes, services, business models which will shape the future of our economy and society. Hence, support of research and innovation will be a major factor in encouraging the transition; it will also contribute to the competitiveness of the EU industry. In October 2015, the Commission has launched a major initiative: "Industry 2020 and the circular economy" in the framework of Horizon 2020. This programme will grant over 600 million euros to demonstration projects of an innovative nature that support the objectives of the circular economy in a wide range of industrial and service activities, including process industries, manufacturing, and new business models. This programme also explores a pilot approach to help innovators who encounter obstacles of a regulatory nature (for example ambiguous legal provisions), by setting up partnerships with public authorities ("innovation deals").

This initiative is in addition to a wide range of existing programmes under Horizon 2020 to support innovative projects relevant to the circular economy, in fields such as waste prevention and management, food waste, remanufacturing, sustainable process industry, industrial symbiosis, and the bioeconomy<sup>22</sup>. This will be complemented by the implementation of the Eco-innovation action plan<sup>23</sup>.

The development of the circular economy will not only require cutting edge innovation, but also public and private sources of financing to scale up improved technologies and processes, develop infrastructure and increase cooperation between actors of the value chain. EU funding programmes such as LIFE+ and COSME or cohesion funding will be important to support these objectives. For example, structural funds are directed towards a growing number of programmes supporting the circular economy, including support for reuse and repair, improved production processes, product design and support to SMEs<sup>24</sup>. Private finance also needs to be directed towards new opportunities created by the circular economy. Such projects can differ significantly from business as usual for the financial sector given in particular their cross-value chain nature. The European Fund for Strategic Investments (EFSI) is one of the instruments that can be used to encourage such investments. The Commission will, in collaboration with the European Investment Bank, carry out outreach and help the emergence of projects relevant to the circular economy to be proposed for funding under EFSI, for example in the areas of plastics or mineral recycling. The development of cross sectorial clusters as well as the pooling of resources to develop projects of European dimension will also be pursued. In addition, circular economy projects can benefit from advisory and financing tools from the EIB under the programme InnovFin<sup>25</sup>.

Small and Medium Enterprises (SMEs), including social enterprises, will make a key contribution to the circular economy: they are particularly active in fields such as recycling, repair, and innovation. They also face specific challenges, such as access to funding, or the

---

<sup>22</sup> RTD to add references to Horizon WP 2014-2015 and relevant FP7 calls

<sup>23</sup> [http://ec.europa.eu/environment/ecoap/index\\_en.htm](http://ec.europa.eu/environment/ecoap/index_en.htm)

<sup>24</sup> REGIO to add link to database of REGIO projects

<sup>25</sup> <http://www.eib.org/products/blending/innovfin/?lang=en>



difficulty to integrate circular economy in their activity if it is not their core business. As set out in the Green Action Plan for SMEs adopted in 2014, the Commission is acting to support these companies, to analyse the barriers they encounter to a better use of resources and waste management, as well as to encourage innovation and collaboration across sectors and regions.

The transition to a circular economy will also require a qualified workforce with specific and sometimes new skills, as well as opportunities for employment. The development of such skills will require in particular their integration into the education system, including engineering and business schools. The Commission is following up on its Green Employment Initiative<sup>26</sup> with a series of action to anticipate skill needs and encourage their development and other measures to support job creation in the green economy.

Finally, in order to help mobilize stakeholders around the stakes and opportunities of the circular economy, the Commission will continue to develop its action on public-private partnership, cooperation platforms, and support to voluntary business approaches. Exchange of best practices between Member States is also a very efficient way to disseminate experience and replicate what has worked. The Commission will develop further such exchanges on a wide range of topics relevant to the circular economy, such as food waste, critical raw materials or market-based instruments.

- *The Commission has launched in October 2015 a major initiative under Horizon 2020 including calls for proposal for over 600 million euros on "Industry 2020 and the circular economy", targeting innovative projects which support the objectives of the circular economy, and including a pilot approach to overcome regulatory obstacles for innovators.*
- *The Commission will carry out targeted outreach to help the development of circular economy projects to be proposed under the European Fund for Strategic Investments.*
- *The Commission will continue its action to mobilise stakeholders on the circular economy, and will develop further exchange of best practices between Member States on a number of areas relevant to the circular economy*

## **7. Monitoring progress towards a circular economy**

In order to assess progress towards a more circular economy as well as the effectiveness of action taken at EU and national level, it is important to have a set of reliable indicators. A lot of relevant data is already collected by Eurostat, and can form a basis for this monitoring work. In addition, the Resource efficiency scoreboard<sup>27</sup> and the Raw Materials Scoreboard<sup>28</sup> contain relevant indicators and analysis which will be particularly useful for monitoring progress.

---

<sup>26</sup> COM(2014)446

<sup>27</sup> <http://ec.europa.eu/eurostat/web/environmental-data-centre-on-natural-resources/resource-efficiency-indicators/resource-efficiency-scoreboard>

<sup>28</sup> Developed in the context of the European Innovation Partnership on Raw Materials - Reference or link to the scoreboard

Based on this work, the Commission will work in close cooperation with the European Environmental Agency and in consultation with Member States to propose a simple and effective monitoring framework for the circular economy. In addition to the two above-mentioned scoreboards, this framework will include a set of key, meaningful indicators that capture the main elements of the circular economy. These complementary indicators will be published [in Eurostat reporting / as part as the EU reporting on Sustainable Development Goals], with in particular a new indicator on food waste (see section 5.2) and indicators based on existing Eurostat data in areas such as security of supply for key raw materials, repair and reuse, waste generation, waste management, trade of secondary raw materials in the EU and with third countries, and use of recycled materials in products. Where necessary, action will be taken to improve the quality of existing data.

*In close cooperation with the EEA and in consultation with Member States, the Commission will develop a monitoring framework for the circular economy, aiming at effectively measuring progress based on reliable existing data.*