

# Circular Economy: The Recent EU Strategy On Natural Resource Management

A discussion paper to the roundtable of the National Convention on the EU  
on circular economy<sup>1</sup>

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## 1 Introduction

A circular economy is the newest trend in the European Union policy on the management of natural resources and their efficient use. Its basic principle is the effort to keep the product added value in economic system as long as possible while reducing waste volumes and negative environmental impacts.

Once a product reaches the end of its life in the circular economy, it stays in the system as a resource that can be repeatedly used in production and so creates an additional value. Thereby it gives consumers an option to use products (i.e. their functions) for an extended period of time whereas on the business sector side it provides new economic opportunities of reusing the products, maintaining and repairing them, recycling or providing maintenance and other services (instead of merely selling the products).

This discussion paper has been prepared for the purpose of the current roundtable of the National Convention on the EU on circular economy. It aims to introduce the participants of the roundtable to the basic principles and the EU approach towards the circular economy in the context of European policy on the natural resource management. The discussion paper creates a thematic framework of the roundtable defined by the following questions:

- 1) Are there conditions for transition to the circular economy in the Czech Republic? If not, what needs to be changed?
- 2) On what priority areas under the shift towards the circular economy should the attention be focused? (Changing the existing legislative framework, economic instruments, voluntary activities of the industry, expanding obligations of producers, etc.)
- 3) How should goals, procedures and instruments (registering, statistics, etc.) in the field of waste management in the Czech Republic be set in order to ensure the efficient use of resources under the conditions of economic as well as environmental sustainability of the system? Is it more economical to recycle, incinerate or landfill?

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<sup>1</sup> The discussion paper is based on the study "Identifying tools and specific tasks to ensure the implementation of measures and fulfilment of objectives including proposals of their evaluation as set out in the Czech Policy on Secondary Raw Materials," which was prepared by ENVIROS company for Ministry of Industry and Trade in 2014-2015 and in which the authors of the discussion paper were involved.

- 4) What form should the European legislation have in the area of the circular economy to support economical use of raw materials and resources? What priorities should the Czech Republic promote during its negotiations?

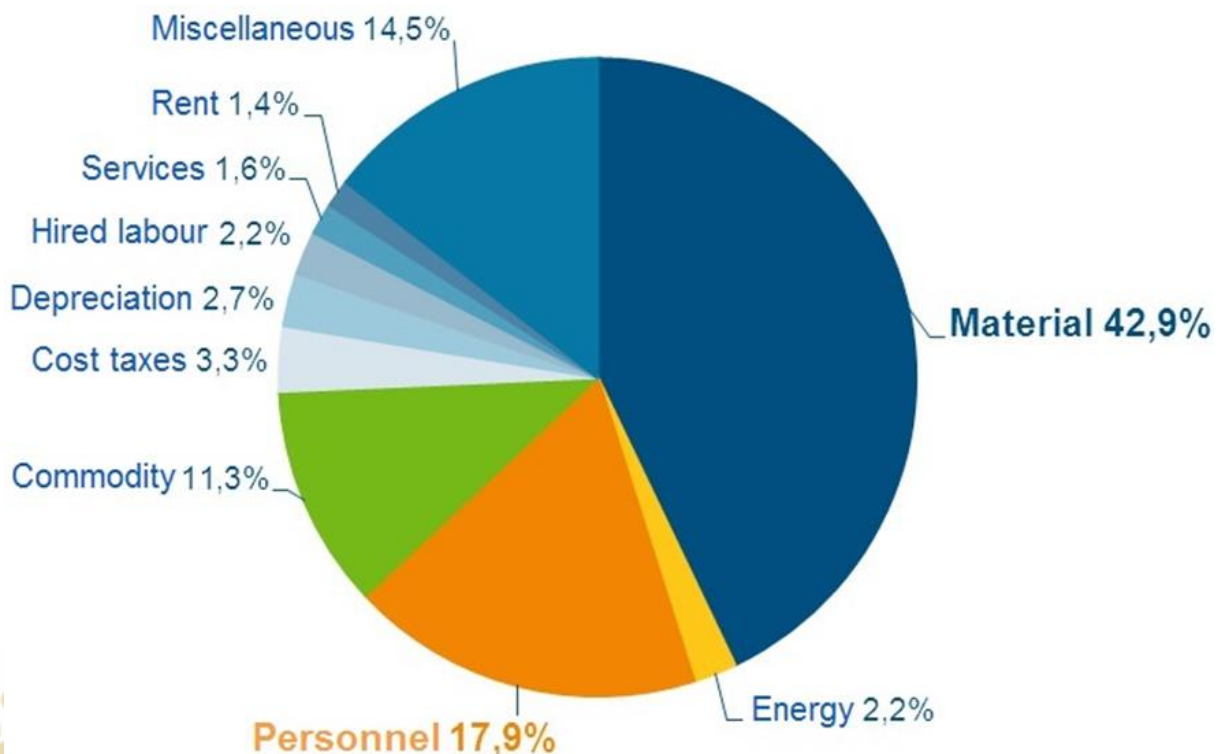
## 2 Management of Natural Resources

The issue of the management of natural resources (raw materials) – at both European and national levels – is paid a significant attention to, which is reflected both in the accent of this issue in several strategic, political and legislative documents, and in the support for related programmes and initiatives (e.g. European Innovation Partnership on Raw Materials).

More than 30 million jobs in the EU depend on availability of raw material resources. The European Union uses non-renewable raw materials by 89%, and a very significant part of European industrial enterprises are dependent on import of these raw materials from other parts of the world. In the case of some raw materials (elements), the EU's dependence is hundred percent, including the so-called critical raw materials. In addition, these materials are often imported from unstable or otherwise problematic regions.

Besides reducing the dependency, also the economic aspect is very important. In fact, in many industries, the cost of raw materials and other materials constitutes a significant cost item, which is often more important than the cost of labour or energy (see the figure below).

**Figure 1: Breakdown of costs in manufacturing enterprises in Germany<sup>2</sup>**



*Source: Federal Environment Agency (UBA), Germany (based on data from the Federal Statistical Office)*

Due to the insufficient availability of raw materials in the Czech Republic and also due to the significant focus of the Czech economy on industrial production, secondary raw materials are important raw material resources for all industries. Their use brings economizing on primary

<sup>2</sup> Statistics for small and medium-sized manufacturing enterprises (NACE 10 – 33) in Germany.

resources, reducing costs in industrial enterprises and also reducing negative impacts on the environment and human health.

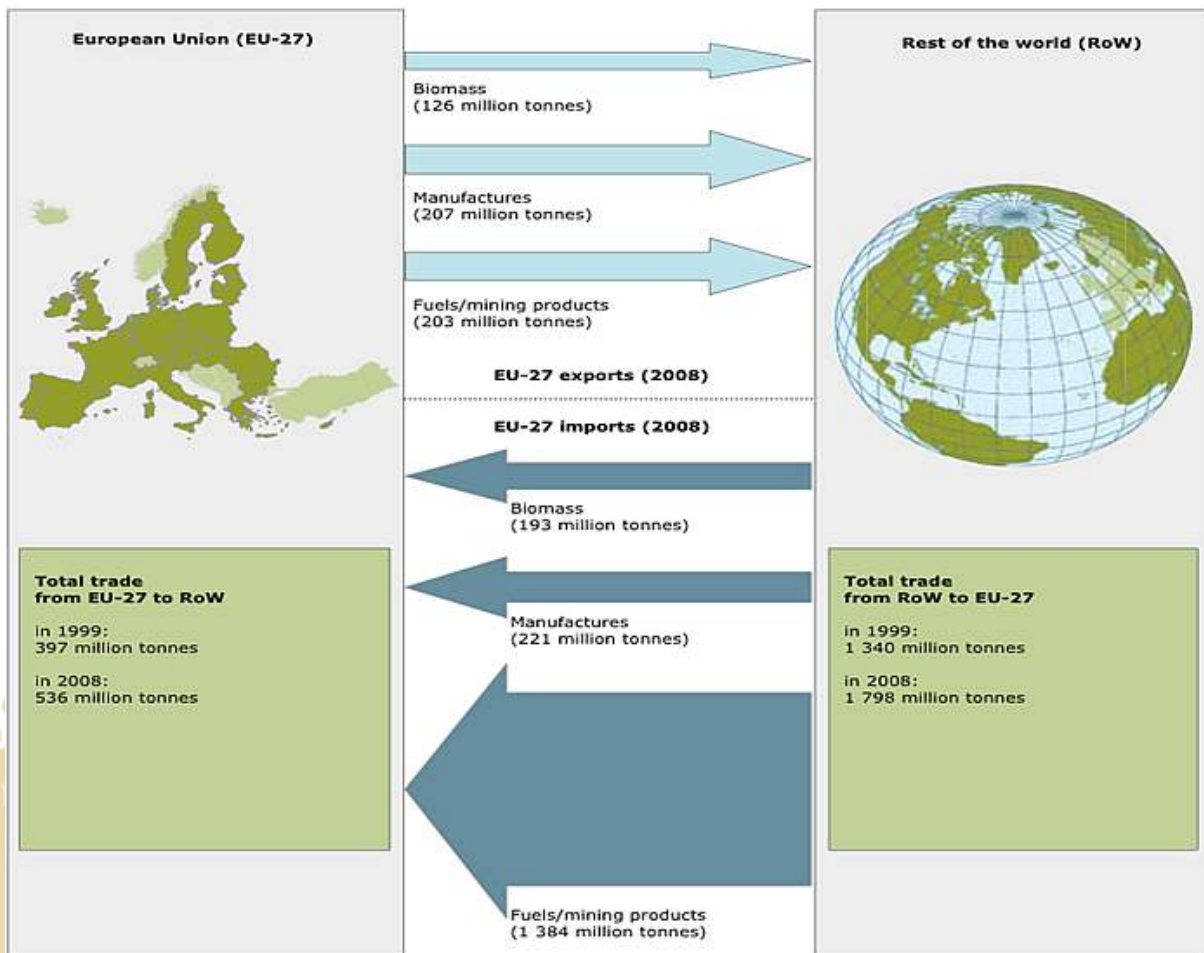
The support for prevention and the use of secondary raw materials also aim to meet one of the objectives of the Strategic Framework for Sustainable Development in the CR – the achievement of the Czech Republic’s maximal import independence on energy and material resources while supporting sustainable resource management.

## 2.1 EU strategy and legislation

The management of natural resources and their more efficient use is a topic that has been increasingly accentuated at the level of the European Union and represents a basis for the EU’s fundamental strategic and political priorities. The reason is the effort to increase the efficiency of European economy (both in macroeconomic terms and in terms of individual enterprises), reduce the dependence on imported raw materials and achieve benefits in environmental protection.

A recent analysis conducted by the European Environment Agency shows that the European Union imports eight times more primary raw materials than it exports them. Furthermore, mining and transport of these materials then bring considerable environmental and economic costs.

**Figure 2: Exports and imports of energy and raw materials (EU-27; 1999, 2008)**



Source: Eurostat Comtex statistics

Therefore, the necessity to build a less resource-intensive economy is already enshrined in the **Europe 2020 strategy**, on which the European economic policy is based. For promoting more efficient use of resources (and ultimately the circular economy as well), the three so-called flagship initiatives are the most important:

- ◆ Resource-efficient Europe – emphasizes the need to achieve growth based on efficient use of resources, promotion of recycling, better product design and material substitution;
- ◆ Innovation union – accents the support for development and implementation of innovations that lead to reducing pressure on the environment, including the responsible use of natural resources;
- ◆ Industrial policy for the globalization era – emphasizes the need for implementation of such an industrial policy that allows (among other things) the shift towards a low-carbon resource-efficient economy.

In 2008, the European Commission also issued a package on **Sustainable Consumption and Production and Sustainable Industrial Policy (SCP-SIP)**, on the basis of which some related documents were adopted in the coming years in the areas of:

- ◆ Better products and smarter production;
- ◆ Lean production;
- ◆ Global market for sustainable products.

The package includes measures in the area of technologies (e.g. Environmental Technology Verification system under ETAP), environmental management systems (EMAS) and products (ecodesign, ecolabelling, energy labelling, green public procurement).

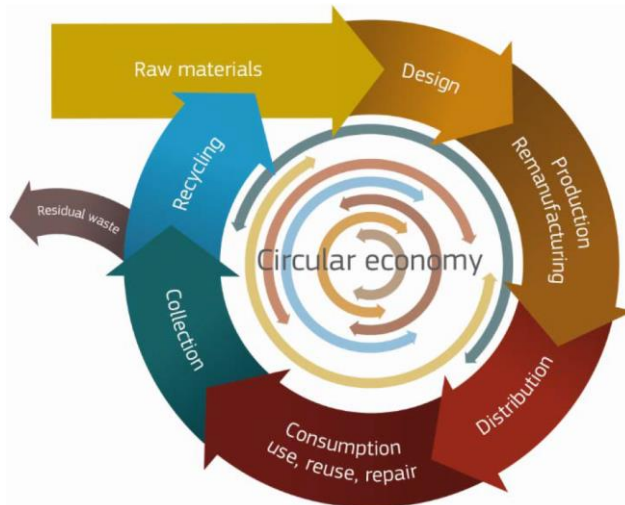
### 3 Circular economy

As mentioned in the introduction, the recent European Union's approach to resource management and resource efficiency is the transition to a circular economy as enshrined in the European Commission's Communication Towards a circular economy: A zero waste programme for Europe.<sup>3</sup>

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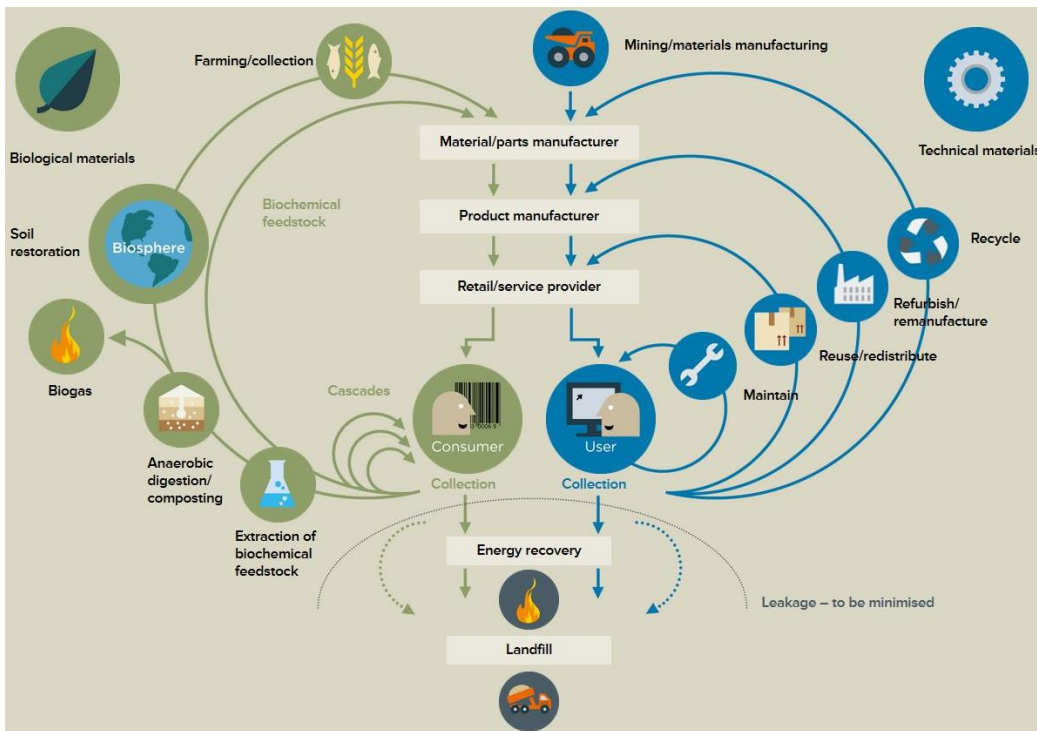
<sup>3</sup> COM(2014) 398 final of 2 July 2014.

**Figure 3: Circular economy model**



Source: *Towards a circular economy: A zero waste programme for Europe*

**Figure 4: Flows of renewable and non-renewable materials in the circular economy**

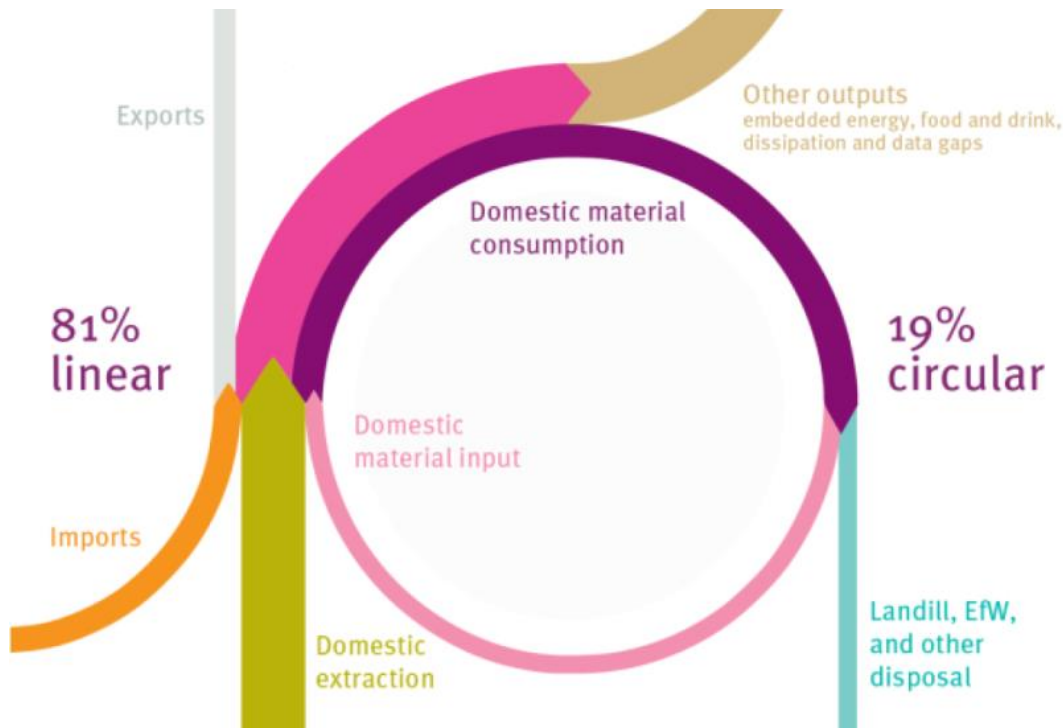


Source: *Ellen MacArthur Foundation*

However, the current economy is still greatly based on a traditional linear principle, consisting in the extraction of primary raw materials, production and consumption of products and their subsequent disposal as waste (termed as 'take - make - dispose') - see following chart illustrating the situation in the UK.



**Figure 5: Circular vs. linear economy – United Kingdom example**



*Source: Resource Efficiency webinar special on decoupling: Final report, European Environment Agency, 2015*

The linear model of economy creates a high pressure on the availability of the planet natural resources, which are gradually decreasing. So their prices are rising continuously and increase the cost of production enterprises, but also service providers. From a macroeconomic point of view, the linear model of the European economy increases the EU's dependence on imports of raw materials (as described above).

That model seems to be unsustainable from a long-term point of view and requires a shift towards the circular model, whose concept allows the renewal by relying on the renewable energy resources and minimizing the use of natural resources.

The shift towards the circular economy requires changes in value chains, from product design up to the creation of new business and marketing models, from new ways of the processing of waste into resources up to new ways of consumer behaviour. Creating a functional circular economy is a complete system change and development of innovations of both technological and (especially) social nature. However, at the same time it must be emphasized that even in the case of highly circular economy a certain amount of primary resources will always be needed and it will always be necessary to remove some residual waste.

### 3.1 Waste in the circular economy

The circular economy represents a comprehensive approach that significantly affects the existing waste management system and the use of secondary raw materials. In its concept the waste does not represent any environmental and economic burden, but above all the opportunity and resource that through its repeated use brings profit to companies, municipalities, regions and the society as a whole. Instead of extracting raw materials and

expanding landfills, the circular economy promotes waste prevention, reuses products, recycles and converts them into energy.

**Figure 6: Waste management in the circular economy system**



Key:

DRUHOTNÉ SUROVINY = SECONDARY RAW MATERIALS, MATERIÁLOVÉ VYUŽITÍ = MATERIALS RECOVERY, dotřídění/čištění/předúprava = final sorting/cleaning/pre-processing, VÝROBA = PRODUCTION, ekodesign/udržitelná spotřeba a výroba = ecodesign/sustainable consumption and production, SPOTŘEBA = CONSUMPTION, efektivní separace = effective separation, SBĚR A SVOZ = COLLECTION AND TRANSPORT, ZPRACOVÁNÍ = PROCESSING, BIOLOGICKÉ VYUŽITÍ = BIOLOGICAL RECOVERY, ENERGETICKÉ VYUŽITÍ = ENERGY RECOVERY

Source: EMPRESS

Each phase of the product life cycle and every item in the value chain play an important role in the circular economy system:

- ◆ Design and manufacture – Social and environmental responsibility of companies is obtaining a new dimension upon the adoption of basic principles of the circular economy. The enterprises design, manufacture and distribute products and technologies with respect to their longer lifespan, material and energy efficiency and the reuse or recycling. These changes generate savings on raw materials, operation cost and waste disposal fees.
- ◆ Consumption – The behaviour of consumers i.e. of a wide society is always crucial, because “demand determines supply”. The consumer, who understands and recognizes the circular economy, does not look for a disposable material consumption, but prefers a long-term and responsible use of values added to all products. He/she buys goods that may not end up in a landfill at the end of their life cycle, but, for example, at a new user or back in production.

- ◆ Collection and transport – Collecting companies that previously focused only on basic waste treatment and its transport to landfills will be replaced by more advanced, modern companies cooperating with municipalities. Based on analyses they will design a tailor-made waste management system for them within the regional concept. They will not only provide collection, transport and subsequent separation of waste into individual components, but will also provide data crucial for optimizing the entire production process in order to make a maximum use of the secondary resources.
- ◆ Processing – Currently, waste is seen as something useless what people throw away. Yet there are many ways how to reuse the used and seemingly unneeded products or their components. Therefore, advanced collecting companies do not transport them to landfill but are looking for their environmentally and economically most efficient use.
- ◆ Energy and biological recovery – Biological waste can be composted and then used to produce crops or transformed into energy. As green plants belong to renewable resources, this is not only more economical, but above all cleaner and more environment-friendly generation of energy.
- ◆ Secondary raw materials – An overwhelming part of now commonly used products is a plethora of parts, components and materials whose life is several times longer than a life of the entire product. Therefore they should not end in landfills. Material recovery is the most economical way of gaining resources as well as the way to reduce the high commodity dependency. The use of existing materials means much lower economic costs and environmental impacts compared to the extraction of primary natural resources.

### 3.2 Strategy and EU legislation

The European Commission's Communication Towards a circular economy: A zero waste programme for Europe identifies aspects that play an important role in the shift towards the circular economy:

- ◆ design and innovation,
- ◆ investments,
- ◆ action by business and consumers,
- ◆ waste policy and legislation.

#### Design and innovation

The circular economy does not leave the solution to the issue “what to do with waste” solely at the end of product life, but minimizes waste already at the phase of the actual design of products and services (or entire production processes) and usually involves innovative practices throughout the entire value chain.

The ecodesign concept has also penetrated into legislation, namely in the area of energy-using products (EuP) and energy-related products (ErP). With the increasing emphasis on more efficient use of non-energy resources, it can be expected that a forthcoming revision of the Directive can consider extending the scope of the ecodesign also for this area – i.e. a



determination of requirements for the design of products related to the consumption of raw materials.

### **Investments**

The solutions respecting the introduction of circular economy should be provided with appropriate financial incentives. These may include:

- ◆ direct funding through grant mechanisms,
- ◆ developing public-private partnership projects (PPPs)
- ◆ applying relevant criteria within the green public procurement (GPP).

As significant economic incentives can also be regarded actions such as removing so-called environmentally harmful subsidies (i.e. the subsidies that contribute to environmental damage) and switching taxation away from labour taxation towards tax payments for environmental pollution and consumption of resources (the environmental tax reform).

### **Action by business and consumers**

Key actors in the transition towards a circular economy are businesses and consumers, however, an important role is also played by other actors within the value chain (producers, investors, distributors, etc.), and the communication between them.

The consumers should be better informed about the environmental (or social) features of different products in order to be able to make informed decisions. For the business sector, it is necessary to ensure that the labour market has necessary knowledge and skills available.

In the future, the importance of consumption models based on lending, swapping, bartering or renting products – the so-called collaborative economy will increase as well. This trend is already well established, for instance, for sharing/renting cars or work tools or food production and distribution.

### **Waste policy and legislation**

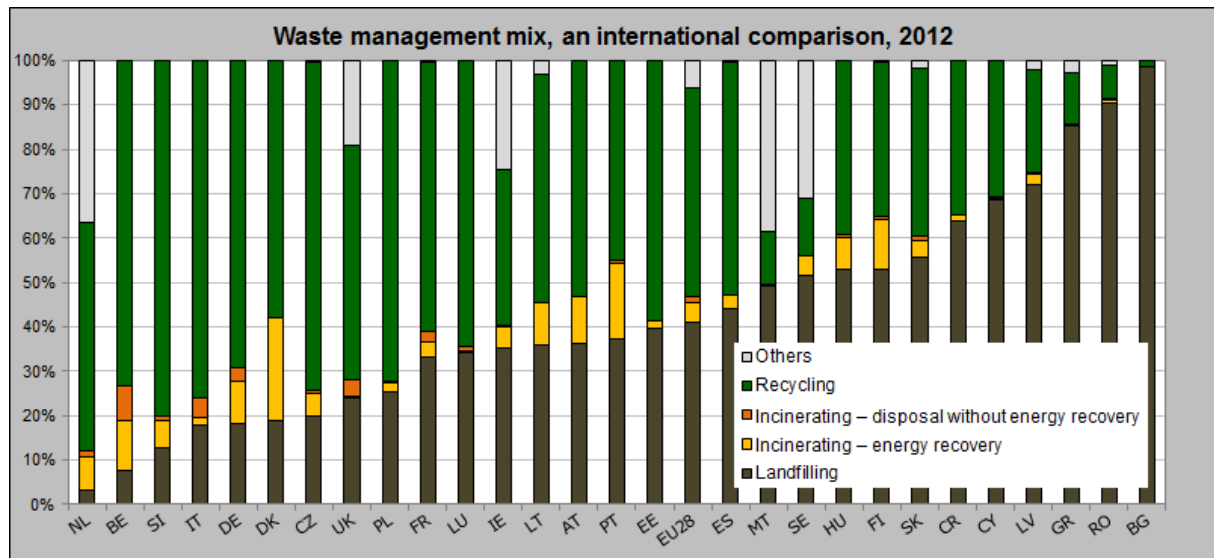
Within the 7th Environment Action Programme, the European Union has set a political commitment to reduce the generation of waste, to recycle waste and create from it a significant, reliable resource of raw materials in the EU, recover energy only from non-recyclable materials and completely eliminate landfills. The basic approaches, which should ensure those objectives, include applying the concept of extended producer responsibility and landfill tax (with a gradual ban on landfilling of selected types of waste).

Currently, the EU generates an average of about five tons of waste per person per year, while effectively recycles little more than a third of the waste. At the same there are significant differences across member states. For example, six member states (Belgium, Denmark, Germany, Netherlands, Austria and Sweden) have effectively eliminated landfills of municipal waste when they managed to decrease the landfilling over the last 20 years from 90% to less than 5% and in some regions reached 85%-rate of recycling. In contrast, other countries still landfill more than 90% of waste and recycle less than 5% of waste.

Although in the Czech Republic more than 70% of waste is used as materials, however, it should be stressed that a significant part of the statistic represents the use e.g. for landscaping, technical protective measures on landfills, for backfills or other less valuable

purposes. On the other hand, the production of high-quality recycled materials, which could find better use in the economic system, is problematic – especially for some commodities. In the case of municipal waste, 50% is landfilled.

**Figure 7: International comparison of waste management structure**



Source: Eurostat, 2012

Turning waste into a resource is one of the options how to close the cycle within the circular economy system. However, the business sector needs clear political signals and objectives, so that it could anticipate changes from the long-term point of view and make necessary investments with a high degree of probability that the invested funds will return.

### 3.3 Current development in EU

As part of the flagship initiative under the Europe 2020 Strategy "A resource-efficient Europe", in 2011 the European Commission adopted a Communication – A roadmap to a resource-efficient Europe.<sup>4</sup> It highlights the need to achieve a growth based on efficient use of resources and defines the transformation of the European economy in a sustainable economy by 2050. However, after the Roadmap, no sufficient measures have been taken to achieve its objectives.

Most recently, the European Commission tries to process the issue of more efficient use of resources under an initiative to the circular economy. In July 2014 the European Commission published the above mentioned Communication "Towards a circular economy: A zero waste programme for Europe". In parallel it proposed a legislative package of related documents to support the circular economy. The package determined new objectives for recycling and waste management; part of it were revisions of directives on waste, packaging, landfills, end-of-life vehicles, batteries and electric and electronic equipment. However, at the beginning of 2015, the newly installed European Commission withdrew these regulations from negotiations with the aim of proposing a more ambitious plan to promote the circular economy.

<sup>4</sup> COM(2011) 571 final of 20 September 2011.

In order to obtain opinions of involved parties about development of the circular economy in the EU, the European Commission initiated a public consultation, which took place this summer. Participants in the public consultation had the opportunity to express their opinion, what areas and measures are crucial for the transition to the circular economy and should be supported most. The consultation was aimed at both the production phase (design, extraction of raw materials and other materials, production) and the consumption phase (use of products, expected lifetime, consumer information). It also highlighted the issue of secondary raw materials, the promotion of innovations and investments, and the identification of priority products and sectors.

The European Commission aims to present the new plan for support of the circular economy by the end of this year. In parallel, Dutch government announced that the circular economy issue would become one of the main priorities of the Dutch EU Presidency in the first half of 2016.

### 3.4 Approaches in selected member states

In the area of the waste management system efficiency, resource efficiency and implementation of circular economy principles, there are significant differences between EU member states. While many countries have already been doing development steps in the particular areas and implementing appropriate measures, other countries (including the Czech Republic) are not yet so advanced and their policy on resources is still largely based on the traditional linear approach.

Among the countries that belong to leaders in those areas within the European Union are above all Germany, the United Kingdom, the Netherlands, Austria and the Nordic countries.

**Table 1: Strategic approaches in selected EU member states**

Country	Approaches and measures
United Kingdom	<p>The UK's overall attitude towards the issue of the natural resource management is based on the idea "Prevention is better than cure". The resource and waste management should lead to a sustainable economy and a reduction of negative impacts on human health and the environment. The objective of the policy is not only an overall lower amount of waste, but especially the increase of opportunities to collect waste, recycle it, reprocess and reuse. The government's role is to promote the sustainable waste management and thereby reduce costs in the business sector and households.</p> <p>The United Kingdom builds on international experience showing that the most efficient are waste prevention policies under the synergy of following actions:</p> <ul style="list-style-type: none"> <li>◆ setting waste prevention objectives,</li> <li>◆ responsibility of manufacturers,</li> <li>◆ variable payment system for domestic waste</li> <li>◆ public sector financing pilot projects</li> <li>◆ cooperation between public and private sectors,</li> <li>◆ that all supported by a long-term and intense public</li> </ul>

	<p>communication campaign.</p> <p>To achieve its objectives, the United Kingdom uses a range of different instruments, including economic and legislative measures, financial aids, support for science and research, information tools and technical assistance support for businesses.</p>
Germany	<p>As one of the few countries in the world, Germany has set a concrete, measurable objective to increase resource efficiency at the national level. In 2002, the German Government in its national strategy for resource efficiency (German Resource Efficiency Programme - ProgRes) set as one of the objectives to double the yield of raw materials (resource productivity) by 2020 compared to 1994.</p> <p>For this purpose, it has set concrete measures and steps. The programme highlights the particular importance of market incentives, information, vocational consultancy, education, research and innovations, reinforcement of voluntary instruments and the promotion of industry and civil society. These measures aim mainly at small and medium-sized enterprises, support environmental management systems and take into account the environmental aspects in standardization processes. Furthermore, they emphasize a more extensive use of more efficient products and services in public procurement, boost ecolabelling and environmental certification, increase the circular economy efficiency, and promote transfers of technology and knowledge into developing countries and emerging economies.</p>
Austria	<p>The Austria's strategic objective is to achieve an increase of the resource efficiency in that way that the environmental impact of the resource use is separated from the economic growth while the resource efficiency of Austrian economy is increasing steadily. The proper waste management as well as the minimization of primary materials should be effective, which is essential for sustainable development.</p> <p>By 2020, the Austrian environmental technologies should have an 8%-share in Austrian GDP, provide employment to 40 thousand people, have an export share of 80% and a global market share of 2.5%, and create 5% of Austrian production capacity.</p>
Netherlands	<p>In the Netherlands an advanced legislation in the area of reuse has been introduced. It consists of a series of regulations, fiscal and financial measures, which rank the Netherlands at forefront when it comes to collecting municipal waste, electronic waste, end-of-life vehicles and other commodities. The basic building blocks of the waste management strategy are the concept of extended producer responsibility and voluntary objectives agreed with sectoral organizations.</p> <p>The national programme "From waste to resource" has eight operational objectives, which should help the transition towards a circular economy. These objectives include a broad package of measures:</p> <ol style="list-style-type: none"> <li>1. Sustainability in front part of the value chain</li> <li>2. Sustainable consumption</li> </ol>

	<ol style="list-style-type: none"> <li>3. Improvement of waste sorting and collecting</li> <li>4. Existing waste policy should focus on the circular economy</li> <li>5. Approach towards specific product chains and their waste</li> <li>6. Creation of appropriate financial and other market incentives</li> <li>7. Link between knowledge and education in the circular economy</li> <li>8. Simplification of methods, indicators and labels</li> </ol>
Denmark	<p>The Danish resource management strategy that was adopted by the government in 2013 considers all waste as a resource that should be either reused or recycled. The objective is to achieve a 50%-recycling of household waste, while currently only 23% is recycled and the rest of the waste is mostly incinerated. The landfilling is considered as a last option.</p> <p>The responsibility for meeting the determined objective is taken by municipalities (in conjunction with the Waste Act). The municipalities are obliged to collect and dispose household waste and control the flow of industrial and other wastes to disposal. However, in the previous period the municipalities invested considerable funds into energy recovery facilities and because of the return on investment it is often more cost-effective for them to use the waste for energy recovery than as a material. Nevertheless, new construction of such facilities has already been prohibited by law.</p> <p>To support a shift towards the circular economy, Denmark plans among other things to implement more effective take-back systems for electronics and clothes and to extract rare earth metals. It will promote the design of products to ensure that they can be easily dismantled and all materials reused or recycled. The support will also focus on the so-called industrial symbiosis measure where the waste from one company is used as a resource for other companies.</p>
Sweden	<p>In Sweden, a transition towards the so-called green economy is currently one of the most important issues and priorities. Sweden justifies the need for this transition by the fact that the proactive approach to the implementation of the green economy may well mean a short-term increase in costs for the Swedish economy, but from the long-term point of view it will bring a significant comparative advantage for the country. A waiting strategy could be beneficial from the short-term point of view, however, for Sweden it would mean subsequently a need to adapt to external conditions without any chance to influence them.</p> <p>Sweden can base the new field development on its rich social capital - educated population, knowledge-based economy and high technological expertise (education is one of the long-term priorities and is generously supported by the government at all levels). Moreover, Sweden is currently in a relatively good financial situation, which creates favourable conditions for the implementation of a proactive policy in the shift towards the green economy and the circular economy.</p>



### 3.5 Applying circular economy in the Czech Republic

Unlike the states mentioned in the previous chapter, in the Czech Republic the issue of circular economy is a relatively new field that began to be intensively addressed just last year. However, what is positive is the fact that the circular economy becomes an interesting issue for various involved parties, which can be seen from the activities of both the public sector (Ministry of Industry and Trade, Ministry of Environment) and the business sector (e.g. the Business for Society Platform) and the non-profit sector (e.g. EMPRESS – the platform “Vision 2024”, Institute of circular economy).

Below is a brief analysis of the current situation in the Czech Republic that is mapping on the one hand positive trends and on the other hand negative (risk) factors affecting the possibility of applying the circular economy principles in the Czech Republic.

#### **Strategic approach**

The necessary condition for the successful implementation of measures for a more efficient use of resources and implementation of the circular economy principles is a clearly declared and practically implemented political support and co-operation across individual authorities. While in this spirit the developed countries are implementing their strategies on a more efficient use of resources and the shift towards the circular economy, the Czech Republic’s vision and strategy is not clearly determined in this area. At the level of the national central administration, rather a sectoral approach prevails, which leads to a fragmentation of the solutions to this issue.

#### **Economic aspects**

After previous years of decline, since 2014 the Czech economy has been growing again, even above average in comparison with other EU countries. This fact creates a very good prerequisite for the implementation of business sector investments into development activities, research projects and innovations, and should be an impetus for the public sector to implement the proactive policy of introducing circular economy principles.

On the other hand, the high tax burden on labour is a problem for the Czech Republic.<sup>5</sup> This situation can be a major hampering factor in applying principles of the circular economy, which is largely based on products, activities and services that are more labour intensive – e.g. repairing or reprocessing products, preparing material recovery from waste, designing products and services, etc. Under current conditions the manufacturers and providers of services of above nature have big difficulties to succeed on the market, and then the trend tends rather to reduce the number of employees and to outsource the labour-intensive work into third countries. The high labour costs also limit development of R & D activities.

#### **Human capital**

Since 2006 the Czech Republic has implemented a greater number of projects dealing with the increase of resource use efficiency and introducing measures of sustainable consumption and production in enterprises and other organizations. The projects have aimed at both applying specific measures in enterprises, and especially training and building professional capacities. So at the level of technical assistance providers, a good basis of professional

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<sup>5</sup> The Czech Republic has been repeatedly warned about this fact by the European Commission’s evaluation reports and criticized for the lack of progress.

capacities has been established that are able to implement relevant projects in enterprises. However, building sufficient professional capacities has been failing so far at the level of technical assistance recipients – i.e. enterprises.

Furthermore, the programs of tertiary and vocational education have not met adequately the labour market needs; for instance, there is no specialized field of study for the recycling and material recovery from waste. There is an insufficient number of student and doctoral theses and scientific research focused on the particular field, whose results could be applied in practice. The labour market does not provide enough qualified material engineers, whose expertise the companies operating in the field of waste management would like to use.

### Waste management

As mentioned above, according to statistics, in the Czech Republic a relatively high percentage of waste is used for material recovery, however, it is often for less valuable purposes. At the same time, there is an insufficient material recovery of municipal waste, which is landfilled by over 50%. Therefore it is time to support quality, modern equipped processing facilities, facilities for material recovery and recycling of waste.

The issue to be addressed is also the fee rate in the area of waste management, where the cost for waste disposal in landfills is low compared with other technologies. It is characteristic for the countries that are among the leaders in implementing the circular economy principles and have a high level of material recovery from waste that the charges for depositing waste in landfills are the highest ones. At the same time, in many of those countries there is a ban on landfilling selected types of waste.

On the contrary, in the future the Czech Republic can benefit from well-established and functioning collective take-back systems for selected products, which can be a basis for development of the strategy of extended producer responsibility (EPR).

The above-described positive trends and risk factors affecting the implementation of the circular economy in the Czech Republic are summarized in the following table:

**Table 2: SWOT analysis of the implementation of the circular economy principles in the Czech Republic**

S – Strengths	W – Weaknesses
<ul style="list-style-type: none"> <li>◆ Economic growth recovery, increase of investments</li> <li>◆ Gradual improvement in utilization of EU funds</li> <li>◆ Relatively good efficiency of primary waste separation</li> <li>◆ Existence of professional capacities for a more efficient use of resources, material and energy flows at the level of technical assistance</li> </ul>	<ul style="list-style-type: none"> <li>◆ Temporarily insufficient political support</li> <li>◆ Fragmentation in addressing the relevant issue by individual authorities</li> <li>◆ Insufficient expertise at the enterprise level</li> <li>◆ Lower efficiency of processing sorted waste, lack of processing capacities</li> <li>◆ High share of landfilling waste (especially municipal waste)</li> <li>◆ High tax burden on labour compared with a low tax burden on the resource consumption and pollution</li> </ul>

	<ul style="list-style-type: none"> <li>◆ Low level of investments in research and development</li> </ul>
O – Opportunities	T – Threats
<ul style="list-style-type: none"> <li>◆ Potential for increasing energy and material efficiency in enterprises</li> <li>◆ Large number of examples of good practice from abroad</li> <li>◆ Option of using EU subsidies (OPE, OPEI, Horizon 2020, LIFE +)</li> <li>◆ Measures to achieve environmental protection objectives and in parallel to support the competitiveness of enterprises and the entire economy</li> </ul>	<ul style="list-style-type: none"> <li>◆ Economic problems (markets – EU, world)</li> <li>◆ Suppliers put pressure on non-system solutions</li> <li>◆ Investors put pressure on minimizing investment costs regardless of the total cost of the investment in its life cycle</li> </ul>



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