

JOINT CIRCULAR ECONOMY STRATEGY

JOINT CIRCULAR ECONOMY STRATEGY: KOŠICE

10 2020





D.T1.2.6: JOINT CIRCULAR ECONOMY STRATEGY: KOŠICE

A.T1.2 Developing a local circular economy strategy

Issued by:	Lead Partner – TUKE; Partner Nr. 2 – Via Carpatia
Reviewed by:	Partner Nr. 5 – APE FVG
Version date:	16.10.2020
Version. Revision	2.4
Circulation	Restricted to Project Partners

Document History

Date	Version	Description of Change
26.02.2020	v. 1.0	Draft version by LP and PP2
31.03.2020	v. 2.0	Several important changes made by LP and PP2
07.05.2020	v 2.1	Reviewed by PP5
31.08.2020	v 2.2	Revision by LP and PP2
15.10.2020	v 2.3	Final revision by LP and PP2
16.10.2020	v 2.4	Document reviewed by PP5

This document reflects the author's view. The programme bodies are not liable for any use that may be made of the information contained therein. This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF.



CONTENT

1. INTRODUCTION.....	3
2. SUMMARY.....	3
3. GENERAL CONTEXT.....	3
4. KEY OBJECTIVES OF THE PROJECT	5
5. THE STRATEGY FOR KOŠICE REGION	5
5.1. DEFINITION OF STAKEHOLDERS.....	5
5.2. SPECIFIC OPPORTUNITIES IN THE TERRITORY	5
5.2.1. Political and legislative framework in the EU	5
5.2.2. Political and legislative framework of the national and regional level of the Slovak Republic	7
5.2.3. Characteristics of the Košice Region	13
5.2.4. Waste management in the Košice Region.....	14
5.2.5. Opportunities of the circular economy by sector	19
5.3. SPECIFIC CHALLENGES IN SLOVAKIA AND IN THE KOŠICE REGION.....	22
5.4. AIM OF THE PROJECT AND ITS GOALS	23
5.4.1. Aim of the project.....	23
5.4.2. Priority areas and activities	24
5.5. HUB AND ECONOMIC SUSTAINABILITY	25
6. ANNEXES.....	26



1. INTRODUCTION

The circular economy strategy for the Košice Region was designed adopting an interactive and integrative approach by actively involving the stakeholder's group in two dedicated workshops as described in "D.T1.2.11 CE strategy workshops". The workshops were meant to share knowledge and ideas, create synergies among key stakeholders and pursue a bottom-up approach throughout the strategy building process. This is also to ensure commitment and acceptance by relevant stakeholders in view of the long-term sustainability of the strategy.

The strategy is ruled by the provisions set forth in the Manifest signed by relevant stakeholders. It represents the framework agreement upon which the local hub will be built and that will be described in the deliverable "D.T1.3.1 Circular economy hubs implemented: Košice". The Manifest is an agreement signed by regional stakeholders which identify the joint objectives and the next activities foreseen to boost circular economy initiatives within CITYCIRCLE in the Košice Region. The Regional stakeholders' group has been previously identified with the regional mapping "D.T1.1.1 Regional mapping for CE transition - Košice" and officially established through bilateral and/or plenary meetings as reported in deliverable "D.T1.2.1 Regional Stakeholders' group - Košice".

The aforementioned Manifest is attached to this document. The next paragraphs contain information on the strategy and the context in which it is intended to be applied.

2. SUMMARY

The CITYCIRCLE project aims to bring innovation and sustainable economic growth to peripheral regions within the European Union. This is thanks to the implementation of circular economy practices. The partners of this project are 11, coming from different European countries (Austria, Croatia, Germany, Italy, Slovenia and Slovakia). The idea is to combine the efforts of the private sector and the public sector to generate a terrain suitable for the diffusion of circular economy practices. To achieve this it is necessary to involve stakeholders from different areas, in accordance with the principles of the quadruple helix, which plan to create collaborations between Public Authorities, Universities, companies and civil society. The aim of the project is therefore to create the best possible conditions for generating economic growth in the area, resulting from innovation and sustainable development.

3. GENERAL CONTEXT

At European level, the transition from a linear economy to a circular economy is an absolute priority. This depends on the fact that, not only this will be indispensable for achieving the objectives set for the protection of the environment, but it will also result in competitive advantages in economic terms. Consider the decarbonisation and climate agreements that involve the European Union. We can cite as an example the European Green Deal, which represents a set of policies aimed at making Europe carbon-neutral by 2050. This context therefore generates important opportunities for companies and public bodies to be able to invest in new technologies, making their activities more competitive on the one hand and making cities more healthy places on the other.

Taking the 17 goals for sustainable development as a guideline, it is clear that for some of them, the circular economy can facilitate their achievement. In the following table (Schroeder et al., 2019) we see what is the relevance and the possible impact of CE for every single SDG. The numbers in the boxes represent the number of targets related to the corresponding goal that CE could help to achieve in some way. Sometimes we notice an inverse relationship that represents the cases in which reaching the target could be helpful in order to support CE diffusion. For these researches CE framework can permit us to reach different SDGs targets; the total number of targets is 169 and CE seems to help



directly for 21 of them and indirectly for other 28. Talking about SDGs: 6, 7, 8, 12 and 15 are the ones for which there exist the strongest link with CE.

	<i>Direct contribution of CE practices to achieve target</i>	<i>Indirect contribution of CE practices to achieve target (e.g., via other SDGs)</i>	<i>Achieving target will contribute toward CE</i>	<i>Weak or no link</i>	<i>Cooperation opportunities for CE promotion</i>
Goal 1	0	4	1	1	1
Goal 2	1	3	3	0	1
Goal 3	1	0	0	11	1
Goal 4	0	0	5	3	2
Goal 5	0	0	2	6	1
Goal 6	4	1	0	0	3
Goal 7	3	1	0	0	1
Goal 8	2	3	4	1	2
Goal 9	2	0	6	0	0
Goal 10	0	1	4	4	1
Goal 11	1	3	3	2	1
Goal 12	3	5	2	0	1
Goal 13	0	1	3	0	1
Goal 14	1	2	3	1	3
Goal 15	3	3	1	1	4
Goal 16	0	1	6	5	0
Goal 17	0	0	9	0	10
Total	21	28	52	35	33

With this in mind, CITYCIRCLE aims to disseminate tools such as industrial symbiosis in order to provide examples of good sustainable development practices that will then have to be repeated by other companies and other organizations. A problem in this regard may be the fact that, especially dealing with peripheral territories, interested parties may find difficulties and barriers on several fronts (Kirchherr et al., 2018):

- A) **Cultural:** hesitant company culture, limited willingness to collaborate in the value chain, lacking consumer awareness and interest, etc.
- B) **Regulatory:** limited circular procurement, obstructing laws and regulations, lacking global consensus, etc.
- C) **Technological:** lacking ability to deliver high quality remanufactured products, limited circular designs, too few large-scale demonstration projects, etc.
- D) **Market:** low virgin material prices, lacking standardization, high upfront investment costs, etc.

To cope with these problems, CITYCIRCLE provides for the implementation of facilitator offices (HUBs) capable of following companies and organizations of various types along the transition path.



4. KEY OBJECTIVES OF THE PROJECT

In order to create, as mentioned, a favourable environment for sustainable development, the CITYCIRCLE project will focus on the following objectives:

- 1) Implementation of pilot projects that will serve as an example for future initiatives:** This will happen thanks to the collaboration with the stakeholders and the identification of specific and promising projects.
- 2) Promotion of the initiative and the concept of circular economy:** through events, web advertising campaigns, etc.
- 3) Creation of a circular economy HUB in each of the regions identified by the project:** It will represent a facilitator office able to offer services to users and stakeholders in the transition to the circular economy.

5. THE STRATEGY FOR KOŠICE REGION

In this paragraph you will find indications regarding the specific characteristics of the territory in question, the plan for achieving the project objectives contextualized in the region and other information always related to the specific context.

5.1. DEFINITION OF STAKEHOLDERS

Close cooperation is a key element in achieving this ambitious goal. Achieving circulation requires the systematic involvement of all stakeholders on a regional, national as well as international level. Given global megatrends, we do not have enough time to invest in what has already been discovered and implemented. We need to ensure the exchange of current knowledge, experience and proven solutions so that we can use our resources in a smarter and more sustainable way to create an environment for new business models. With its local partners, Košice self-governing region wants to contribute to a sustainable and greener future with its activities and support the transformation within one generation to become a full-blooded circulating region of the country.

Partner organizations

- Technical University of Košice
- EZUS Via Carpatia
- Košice self-governing region
- Institute of Circular Economics

5.2. SPECIFIC OPPORTUNITIES IN THE TERRITORY

The following is a brief overview of global and European trends in the circular economy, a brief overview of national and regional policies and legislation for the circular economy (and other related areas, such as waste management, resource efficiency, etc.) and of the nature of the Košice Region, and its key economic sectors interconnected with the circular economy.

5.2.1. Political and legislative framework in the EU

Current developments in the strategic framework for the circular economy at European and national level. The European Commission, led by Ursula von der Leyen, has set itself the goal of making Europe the first climate-neutral continent by 2050, which he said is the greatest challenge and an opportunity of our time. The transformation to a



climate-neutral economy will also require a set of measures to move towards a circular economy. "The implementation of the expected action plan, which will cover areas from production and consumption, through digital technologies to the promotion of the circular economy in the adoption of international agreements, will require close cooperation between ministries, the private sector and the third sector."

The European Green Deal

EU industry still accounts for 20% of greenhouse gas emissions and remains too "linear" and only 12% of the materials used in industry come from recycling. In March 2020, the Commission will adopt an EU industrial strategy to address the dual challenge of ecological and digital transformation. The decarbonisation and modernization of energy-intensive industries such as the steel, chemical and cement industries, which are irreplaceable for the European economy, is crucial. The measures will focus in particular on resource-intensive sectors such as textiles, construction, electronics and plastics. The new circular economy action plan will include a sustainable products policy to support the circular design of all products based on a common methodology and principles. Material reduction and reuse are preferred to material recycling. Intentional obsolescence of equipment - especially electronics - will be reduced. New business models will be promoted and minimum requirements will be set to prevent the placing on the market of environmentally harmful products on the EU market. Furthermore, producer responsibility will be extended. The Commission will develop requirements to ensure that all packaging on the EU market can be reused or recycled multiple times by 2030, propose a regulatory framework for biodegradable plastics and bioplastics, and take action on disposable plastics. The Commission will focus on measures to combat the deliberate addition of microplastics and the unintentional release of plastics. EU companies should have a large and integrated single market for secondary raw materials and by-products. The Commission will consider legal requirements to strengthen the market for secondary raw materials with mandatory recycled content. To simplify waste management for citizens and provide greener secondary raw materials for businesses, the Commission will also propose an EU separate waste collection model. The Commission will review the rules on shipments of waste and illegal exports outside the EU; in 2020, propose legislation to ensure a safe, circulating and sustainable value chain for all batteries, including those supplying the growing electric vehicle market. The Commission will examine measures to ensure that digital technologies can be deployed more quickly and maximize the impact of policies to address climate change and protect the environment. As public authorities, including the EU institutions, should lead by example, the Commission will propose further legislation and guidelines on "greening" public procurement.

Achieving the EU's climate and environmental goals requires a new industrial policy based on circular economy.

- Only 12% of the materials used in EU industry come from recycling
- EU industry produces 20% of EU emissions.
- More than 90% of biodiversity loss and water scarcity problems come from resource extraction and processing.
- Between 1970 and 2017, the world annual material extraction tripled and continued to grow.

New circular economy action plan will help modernize the EU economy. The Commission will present a sustainable products policy, the priority of which will be to reduce and reuse materials before recycling them. Minimum requirements are set to prevent the placing on the EU market of environmentally harmful products. The issue of false environmental statements will be addressed.

Efforts will first focus on resource-intensive sectors such as:

- textiles,
- construction,
- electronics,
- plastics.

EU support programs

Community programs i.e. centrally managed EUs are a complementary source of funding for the defined pillars / priorities / measures of the Action Plan. The following Community programs are relevant for the transformation of the region:



- LIFE program (environment and climate protection);
- Horizon 2020 (support for research and innovation linked to economic growth and job creation);
- COSME program (support for entrepreneurship and improvement of the business environment for small and medium-sized enterprises);
- Globalization Fund: (labor market measures including personal counseling, job counseling or assistance, training and mobility allowances for workers who lose their jobs as a result of globalization);
- Modernization Fund: (support for investment in the modernization of energy systems, including energy efficiency improvements);
- Innovation Fund: (support for innovation in low carbon technologies and processes)

5.2.2. Political and legislative framework of the national and regional level of the Slovak Republic

National level

A sustainable circular economy is part of the vision defined in the Environmental Policy Strategy of the Slovak Republic until 2030. The circular economy is based on the sustainable use of resources in a closed cycle from their acquisition, use in production, distribution, consumption and subsequent reuse of materials. One of the concepts of the circular economy is the use of local resources by linking them to local consumption.

In this context, the priority focuses on supporting local agriculture and other aspects of the circular economy, such as sustainable waste management and water management.

Green and circular economy

Today's economic model poses far-reaching environmental and health risks, leads to increased greenhouse gas emissions, waste, accelerates biodiversity loss, depletes raw material resources and leads to the creation of an unfair society. A green economy is an alternative to change. The growth of income and employment is ensured by investments that reduce carbon emissions, total air and water pollution, increase more efficient use of energy and raw material resources, and prevent the loss of biodiversity and ecosystem services. The green economy is moving from a linear model where products become waste in landfills or end up in incinerators after use, to a circular one in which resources are used efficiently with an emphasis on reuse and recycling and in the spirit of waste prevention.

The main goal of waste management in the Slovak Republic until 2020 is to minimize the negative effects of waste generation and management on human health and the environment. Achieving the set targets will require more substantial enforcement and adherence to a binding waste hierarchy in order to increase waste recycling, in particular for municipal waste and construction and demolition waste, in line with the requirements of the Waste Framework Directive. In waste management, it is necessary to continue to apply the principles of proximity, self-sufficiency and, in selected waste streams, extended producer responsibility for new waste streams, in addition to the generally established "polluter pays" principle. The Best Available Techniques (BAT) or Best Environmental Practices (BEP) requirements need to be applied when building waste management infrastructure. The strategic goal of waste management in the Slovak Republic for the period from 2016 to 2020 remains the fundamental diversion of waste from its disposal by landfill, especially for municipal waste.

In the area of legislation, the Ministry of the Environment of the Slovak Republic is currently setting up important aspects of the functioning of waste management. We are also striving to change consumption and production patterns by using economic instruments, including strengthening green public procurement. However, the issue of the transition to a green circular economy is a complex issue in which the key to success is the intensive involvement of all actors in society, both state and public administration, as well as partners from business, academia and civil society.

The transition to a circular economy is also defined as one of the strategic priorities of **the Environmental Policy Strategy until 2030**. The strategy does not contain a detailed action plan, but will suggest the basic direction of future policies to improve the state of the environment. Whether legislation, implementing regulations or the use of public



funds are to be adopted in the future, they should be in line with the objectives and measures of the 2030 Environment Strategy.

As part of its development strategies, the European Union has set itself the goal of achieving the maximum material and energy use of waste within the circular economy, while minimizing its disposal. Proper waste management is the basis of the circular economy and helps to prevent the negative impact of waste on the environment and health. Local actors and their involvement in waste management activities play a crucial role in waste management. In 2016, Europeans generated an average of 480 kg of municipal waste per person, of which 46% was recycled or composted and a quarter was landfilled. Despite the fact that in 2016, 359 kg of municipal waste was produced per capita in Slovakia, the 66% landfill rate indicates an inappropriate method of municipal waste management. Municipal waste accounts for only around 10% of total waste generated in the EU, but in terms of disposal it is one of the most complex streams due to its diverse composition, large number of generators and fragmented responsibilities.

For the European Union as well as the Slovak Republic, the target of preparing 50% of municipal waste for reuse / recycling by 2020 applies. As this is not a one-off target, the European Union has adopted new and more ambitious targets, namely that 55% of recycling should be achieved by 2025, 60% by 2030 and 65% by 2035. Despite clearly defined targets for municipal waste management, up to 14 EU Member States are at risk of failing to meet the 2020 target. Slovakia is also among these countries.

Based on the Plan of Legislative Tasks of the Government of the Slovak Republic for 2019, the Ministry of the Environment of the Slovak Republic submits to the legislative process a draft law amending Act no. 79/2015 Coll. on Waste and on Amendments to Certain Acts, as amended, and Amending Certain Acts Act no. 79/2015 Coll. on waste and on the amendment of certain acts as amended by Act no. 91/2016 Coll., Act no. 313/2016 Coll., Act No. 90/2017 Coll., Act No. 292/2017 Coll., Act no. 106/2018 Coll., Act No. 177/2018 Coll., Act no. 208/2018 Coll., Act no. 312/2018 Coll., Act no. 302/2019 Coll., Act No. 364/2019 Coll. and Act no. 460/2019 Coll. due to the transposition of the so-called "Waste package" consisting of the following directives, namely Directive 2006/66 / EC of the European Parliament and of the Council of 30 May 2018 amending Directive 2000/53 / EC on end-of-life vehicles, batteries and accumulators and waste batteries and accumulators and 2012/19/EU on waste electrical and electronic equipment, Directive (EU) 2018/850 of the European Parliament and of the Council of 30 May 2018 amending Directive 1999/31/ EC on the landfill of waste Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98 / EC on waste and Directive (EU) 2018/852 of the European Parliament and of the Council of 30 May 2018 amending Directive 94/62/EC on packaging and packaging waste. The law regulates provisions concerning certain basic definitions and terms, complements the municipal waste recycling targets for 2025, 2030 and 2035 and the packaging waste recycling targets for 2025 and 2030. The law obliges producers of the reserved product and producer responsibility organizations to set up financial security to ensure a system of extended producer responsibility. The updated law adopts measures to favor producers placing recyclable products on the market, as well as measures to support the re-use of waste, recycling and other recovery activities, and measures to reduce the generation of plastic waste, i.e. market placement of certain disposable plastic products is prohibited in the Slovak Republic. At the same time, the provisions on the waste management information system and some provisions are being amended due to the requirements of application practice. The bill will ensure the elimination of transposition shortcomings, which the European Commission points out in the case of EU Pilot no. EUP (2016) 8727 concerning incorrect transposition of Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste and Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE).

Another key document is **the Waste Prevention Program of the Slovak Republic for the years 2019 - 2025 (hereinafter referred to as WPP)**. It is a strategic document that aims to change the principles and direction of waste management and sets as its main goal a shift from material recovery to waste prevention. A set of measures has been proposed to meet the main objective.

The main goal of the WPP of the Slovak Republic for the years 2019 - 2025 is to move from material recovery as the only priority of waste management, to the prevention of waste generation.

The document further sets specific targets for nine waste streams:



- biodegradable waste,
- food waste,
- paper waste,
- bulky waste,
- plastics and packaging,
- construction waste,
- hazardous waste and
- waste from the mining industry.

For each waste stream, indicators have been defined to evaluate the fulfillment of the target, the current situation in the given area is described and measures for the fulfillment of the target are proposed, including the possibility of their financing. The main responsibility for the implementation of measures lies with the Ministry of the Environment of the Slovak Republic. However, without active cooperation with the relevant state administration bodies, non-governmental organizations, local self-government and the general public, it will not be possible to meet the set goals. Waste prevention also affects areas such as the extraction of raw materials, the production, distribution and sale of goods and services. The change in behavior in the area of production and consumption, the aim of which is to reduce the generation of waste, requires a change in several legal regulations, not only within the competence of the Ministry of the Environment of the Slovak Republic.

Sub-targets for individual waste streams:

- Reduce the amount of mixed municipal waste by 2025 by 50% compared to 2016,
- Reduce the amount of biodegradable waste in mixed municipal waste by 60% by 2025 compared to 2016.
- Promote the reduction of food waste generated by retail and consumers and reduce food losses throughout the food production and distribution chain.
- Reduce the generation of paper waste and reduce the proportion of paper in mixed municipal waste.
- Increase the reuse of bulky waste.
- Restrict the use of non-recyclable disposable plastic packaging.
- Prevent excessive packaging within a single product.
- Promote the recyclability of plastic products and packaging (following the European strategy for the plastics in the circular economy).
- Reduce the amount of construction and demolition waste disposed of.
- Continue the emerging trend of reducing hazardous waste.
- Reduce the generation of waste from the extractive industries through the application of applicable legislation and the implementation of regular inspections within the state supervision.
- Prevention of major accidents that could have an impact on the environment and human health.

Innovation strategies

When it comes to Circular economy innovations, the national Regional Innovation Smart Specialization Strategy needs to be addressed - captured in the document "Strategy of research and innovation for smart specialization of the Slovak Republic (RIS 3, 2013).

Our regional S3 identifies development trends in the specialization areas of economy, pointing to the intentions to increase - energy efficiency and use of renewable energy and according to that goal to develop production processes in industry focusing on better use of available resources, greater use of recycling materials and environment-friendly materials through the R&D. From the scientific and research capacities, the area of sustainable energy is highlighted. We have very strong potential for exploration of domestic energy sources, including uranium, geothermal energy and their use, as well as to develop technologies for obtaining electricity and heat from renewable sources (water, sun, wind, biomass and geothermal energy).

Strong related sectors related to Circular Economy cover following:



- *ICT and electronics* - Consumer electronics and electrical equipment, as well as ICT and related services, were identified as two out of four areas according to the development trends in the specialization areas of economy, as e.g. raising level of ICT and robotics application in the production processes.
The most interesting prospects of the specialization, with the aim to support development of smart solutions based on innovate technologies is at the following domains: Automation, Robotics and Digital Technology.
- *Advanced materials and nanotechnology* - There is a strong demand for a change of in use of traditional materials towards advanced materials with a new and more complex performance, including technological processing (machining, forming, joining). Development of technological investment units, particularly in the field of metallurgy, engineering, energy and integrated industrial equipment is assumed. This is with respect to the application and use of light metals and advanced materials in the manufacture of transport and construction facility to reduce overall weight and contribute to the green economy (development and application usage of composite materials). Production and processing of polymers, advanced chemical substances (including smart fertilizations) and nanotechnology are also one of the most important technological priorities in the S3.
- *Agri-food a forestry* - Within identified technological priorities we can find also environment, agriculture and food security with a focus on advanced technologies and practices in agriculture and food production to ensure the sufficiency of quality food production. A large part of the county in Slovakia occupies agricultural land and this share is even higher in Kosice region, comparing to the average. As opportunities was identified insufficiently used agriculture and water resources management potential and also strengthening the cooperation between industry and R&D sector, as agriculture field is one of most powerful areas for the production of new scientific knowledge. Strengthening cooperation between research and development organization in the area of agriculture and environment and businesses will contribute to an increase in the quality of life and in self-sufficiency in the production of good-quality food.
The Communication of the European Commission to the Council and the European Parliament on innovative and sustainable wood processing industry mentions that the wood processing industry in the EU with production in the value of EUR 365 billion and added value approximately EUR 120 billion provides more than 3 million jobs in 344 thousand enterprises. It plays an important role in preserving the employment in rural areas.
Taking into account the potential and tradition of wood processing as an ecologically friendly and renewable raw resource, the domestic forest and wood processing sector has an ambition and conditions to become an important sector of the Slovak economy. It also contributes to mitigation of climate change by storing carbon in forests and by using the wood instead of non-renewable resources.
The better utilization of the forests, which cover almost 50% of the Slovak area, is a good chance together with the following processing of wood. Slovakia has about 450 researchers in this field, who produce about 9% of all outputs in international scientific journals.

National support mechanisms

National support mechanisms also represent a complementary source of funding and can only be used for some of the defined pillars / priorities / measures of the Action Plan. The following support mechanisms are relevant for the transformation of the region:

- Environmental Fund: (support for projects within the framework of activities aimed at achieving the objectives of state environmental policy at the national, regional or local level);
- Slovak business agency (SBA): (comprehensive assistance to entrepreneurs in accordance with the principles of the SME Act initiative, comprehensive support for entrepreneurship at national, regional and local level, strengthening the competitiveness of entrepreneurs within the EU common market and third country markets);



- Slovak Agency for Investment and Trade Development (SARIO): (support of Slovak companies in the transformation into high-performing and successful entities in the globalized world market, support of cultivating the business environment, alleviation of systemic disadvantages of SMEs / smaller enterprises for business);
- Slovak Innovation and Energy Agency (SIEA): (support for small and medium-sized enterprises, including households, in the field of innovation, creative industries and the use of renewable energy sources); Act on the provision of subsidies to support the development of bicycle transport and cycling tourism: (project documentation for the construction or reconstruction of a bicycle road, project documentation for traffic signs of a bicycle road, construction or reconstruction of bicycle infrastructure, awareness and promotion campaigns);
- Operational Program Research and Innovation: is a program document of the Slovak Republic for drawing assistance from EU funds for 2014-2020 in the transport sector, in improving access to information and communication technologies and improving their use and quality, and in creating a stable environment favorable for innovation for all relevant actors and to support the increase of the efficiency and effectiveness of the research, development and innovation system, as a fundamental pillar for increasing competitiveness, sustainable economic growth and employment. Innovations in the area of the circular economy were also supported.

Regional level - Košice Region

The Waste Management Program of the Košice Region for 2016 - 2020 (hereinafter referred to as "WMP KR") is a program document of strategic importance in the field of waste management with an impact on the environment, which is prepared for the Košice Region in accordance with the hierarchy and objectives of waste management, which includes an analysis of the current state of waste management in the area and the measures to be taken by 2020 to improve environmentally sound preparation for reuse, recycling, recovery and disposal, as well as an assessment of how the program will support the achievement of these objectives. It follows up on the strategic document of the WMP of the Slovak Republic, which was approved by the Government of the Slovak Republic. The binding part of the WMP KR sets goals for the waste management of the Košice Region for 2020 and defines measures to achieve the set goals and responsibility for their implementation.

The main goal of waste management in the Slovak Republic for 2020 is to minimize the negative effects of waste generation and management on human health and the environment. Achieving the set targets will require more substantial enforcement and adherence to a binding waste hierarchy in order to increase waste recycling, in particular for municipal waste and construction and demolition waste, in line with the requirements of the Waste Framework Directive. In waste management, it is necessary to continue to apply the principles of proximity, self-sufficiency and, in selected waste streams, extended producer responsibility for new waste streams, in addition to the generally established "polluter pays" principle. The Best Available Techniques (BAT) or Best Environmental Practices (BEP) requirements need to be applied when building waste management infrastructure. The strategic goal of waste management in the Slovak Republic for the period from 2016 to 2020 remains the fundamental diversion of waste from its disposal by landfill, especially for municipal waste.

Objectives and measures of the binding part of the WMP of Košice Region are in accordance with the waste management hierarchy according to Article 4 of Directive 2008/98 / EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain directives (Waste Framework Directive).

Implemented measures:

- Increase the level of separate collection for recyclable municipal waste, in particular for paper and board, glass, plastics, metals and biodegradable municipal waste
- Increase the recycling of construction and demolition waste, including backfilling.



- Support the implementation of projects for re-use and preparation for re-use in the municipal 102 sphere, e.g. so-called "Re-use centers".
- Increase the control activities of all bodies of state supervision of waste management and municipalities in order to comply with legal regulations governing the area of waste management.
- Actively participate in the implementation of the principle of extended producer responsibility in the system of separate collection of municipal waste for the components of municipal waste to which this principle applies.
- Collaborate with the professional public on the creation and adoption of a uniform methodology for determining the composition of municipal waste.
- On the basis of the ongoing evaluation of the efficiency of separate collection of municipal waste in connection with the objectives of municipal waste recycling, re-evaluate the possibilities of introducing a new system for the collection of disposable beverage packaging based on the results and findings of a working group established for this purpose.
- Support the implementation of projects aimed at building small composting plants in municipalities where the construction of such facilities is useful.
- Support the implementation of projects to prevent the generation of biodegradable municipal waste in the form of domestic and community composting.
- Continue to introduce separate collection of kitchen, restaurant waste and biodegradable waste from public and private greenery and gardens based on separate collection standards for biodegradable municipal waste.
- Support the implementation of projects aimed at building biogas plants that will produce biogas mainly from kitchen and restaurant municipal biodegradable waste.
- Support the implementation of projects aimed at building biogas plants that will produce biogas exclusively or mainly from biodegradable waste.
- Streamline separate collection of municipal waste
- Support the introduction of technologies aimed at achieving a high level of recycling of recovered paper by progressive technologies for the recovery of paper and board waste that comply with the requirements of best available techniques (BAT).
- Support new projects aimed at solving the recovery and recycling of corrugated paper.
- Support the introduction of new technologies and capacity building for technological treatment and recycling of currently non-recyclable types of waste glass from municipal waste and special types of waste glass.
- Apply Commission Regulation no. Regulation (EC) No 1179/2012 laying down criteria for determining when crushed glass ceases to be waste pursuant to Directive 2008/98 / EC of the European Parliament and of the Council.
- Streamline separate collection of municipal waste with the aim of achieving at least 7,100 tons of sorted plastics from municipal waste by 2020.
- Support the introduction of technologies aimed at achieving a high level of recycling of plastic waste that complies with the requirements of best available techniques (BAT), based on an assessment of existing recycling capacities.
- Do not support the introduction of technologies for the catalytic chemical cleavage of plastics.
- Support the introduction of technologies to increase the technical level of existing recycling facilities, in order to increase the share of new recycled products.
- Support the introduction of technologies for the recycling of problematic types of plastics from the processing of old vehicles and waste from electrical and electronic equipment and mixed plastics.
- Support the introduction of technologies aimed at achieving a high level of recycling of ferrous and non-ferrous metal waste that comply with the requirements of best available techniques (BAT) based on an assessment of existing recycling capacities.
- Apply to the area of ferrous and non-ferrous metal waste
- Support the introduction of technologies to increase the recycling rate of construction waste into higher value-added output products.



- Do not support the introduction of technologies for the recovery of construction waste and demolition waste intended for primary crushing.
- Support the introduction of technologies to achieve a high level of recycling of waste tires that comply with the requirements of best available techniques (BAT).
- Do not support the building of new capacities for processing old vehicles.
- Support the introduction of technologies for the recovery of problem wastes from the processing of old vehicles (e.g. upholstery, foam wastes, rubber wastes, composite materials, etc.).
- Promote the introduction of technologies to achieve a high level of recycling and treatment of used batteries and accumulators that comply with the requirements of best available techniques (BAT) based on an assessment of existing recycling and treatment capacities.
- Thoroughly inspect the institute of preparation for re-use for the area of used batteries and accumulators.
- Support the introduction of technologies for the treatment of waste electrical and electronic equipment that comply with the requirements of best available techniques (BAT) based on an assessment of existing treatment capacities.
- For all collected waste from electrical and electronic equipment, ensure their subsequent processing by an authorized processor.
- Implement the new information system of waste management to clarify the material flow of generated waste oils and the method of their management.

5.2.3. Characteristics of the Košice Region

At the level of districts, the largest district in terms of area is Košice - okolie with an area of 153,460.7 ha (22.7% of the total area of the Košice Region). The smallest districts are the districts of the city of Košice, which together occupy only 3.6% of the region's area. In terms of land use, the highest share of agricultural land is in the districts of Trebišov (73.4%) and Michalovce (71.1%), of which an average of 70% is occupied by arable land. The share of non-agricultural land is the highest in the Gelnica district (80.6% of the total area of the district), of which up to 93% is occupied by forest land.

On the territory of the Košice Region, several branches are decisive, in which the potential of the region is evaluated from the point of view of human resources and material and raw material base (wood, minerals, building materials, traditional production). These are mainly sectors - engineering, woodworking, metallurgical and electrical industry, geology and mining, construction, agriculture, tourism and services. From the point of view of the industrial structure, the most important sectors in the region are the metallurgical, engineering, chemical and ICT and electrical engineering industries. Undoubtedly, metallurgy dominates, accounting for 60% of the region's industrial production and 50% of its exports. The largest company in the region U.S. Steel Košice is also active in this sector. The ICT industry is gaining more and more economic importance, as well as in terms of employment.

Agricultural land in the Košice Region occupies 3,346.9 km² and the region accounts for 14.0% of the agricultural land in the Slovak Republic. The agricultural production of the region in the total agricultural production of the Slovak Republic in 2013 accounted for only 8.9%.

The area of agricultural land in the Košice Region in 2014 was a total of 334,693.4 ha (49.6% of the total area of the region), of which the highest share is occupied by arable land (204,066.7 ha, 61.0% of agricultural land) and permanent grassland (112,183.3 ha, 33.5% of agricultural land). Non-agricultural land in the Košice Region occupies more than half of the region's territory (50.4%) with its area of 340,755.6 ha, of which the highest share is forest land with an area of 268,256.8 ha (78.7% of the area of non-agricultural land).



5.2.4. Waste management in the Košice Region

In 2018, waste was produced in the Košice Region in the amount of 2,048,433.3 tons, of which hazardous waste accounted for 2.5%. Of the total volume of waste produced in the region, 41.8% was recovered, 36.5% was disposed of and 21.7% was other waste management.

In the Košice Region, municipal waste was produced in 2018 in the amount of 263.2 thousand tons and the region accounted for 11.3% of waste production in Slovakia. Per capita 329.2 kg of waste was produced in the region, which is less than the Slovak average (427.0 kg). From a national perspective, the Košice, Prešov and Banská Bystrica Regions have long been among the regions with the lowest municipal waste generation per capita per year. The amount of waste produced per capita is increasing every year, compared to 2014 it increased by 52.7 kg, i.e. about 19%. Of the total volume of municipal waste in the Košice Region in 2018, 202.8 kg / capita was recovered, which is more than the average for the Slovak Republic (191.7 kg / capita). Of the total volume of municipal waste, 61.6% of waste was recovered in the Košice Region in 2018, which is significantly more than the average for the Slovak Republic (44.9%).

Amount of municipal waste in the Košice Region for 2014 - 2018 (in tons)

District	2014	2015	2016	2017	2018
Gelnica	5 610,0	5 885,9	6 230,1	6 339,3	7 572,6
Košice I - IV	87 404,5	91 482,3	82 878,8	98 297,0	90 255,8
Košice - okolie	28 612,1	28 853,0	27 254,3	30 193,6	31 300,1
Michalovce	25 569,4	25 356,6	26 380,3	32 950,8	36 555,8
Rožňava	19 895,7	17 668,5	18 737,7	23 297,5	22 505,3
Sobrance	3 055,1	2 596,0	2 590,8	2 881,9	3 040,8
Spišská Nová Ves	25 168,1	28 436,6	36 431,3	36 861,8	39 242,6
Trebišov	24 583,5	34 127,3	26 695,9	25 002,2	32 738,2
Košice Region	219 898,4	234 406,2	227 199,1	255 824,0	263 211,2

Source: Statistical Office of the Slovak Republic

During the monitored period, except for 2016, there was a gradual increase in the amount of municipal waste in the region. Most municipal waste was produced in 2018 in the districts of Košice I - IV (34.3% of the total amount of municipal waste in the region), in the district of Spišská Nová Ves (14.9%), Michalovce (13.9%) and Košice - okolie (11.9%). The least amount of municipal waste was produced in the districts of Sobrance (1.2%) and Gelnica (2.9%).

Amount of municipal waste per capita in 2014 - 2018 (kg / capita)

District	2014	2015	2016	2017	2018
Gelnica	178,43	186,51	196,59	199,56	238,51
Košice I - IV	364,55	382,20	346,43	410,87	377,62
Košice - okolie	233,24	233,02	217,65	238,65	244,61
Michalovce	230,74	229,24	238,32	297,79	330,32
Rožňava	316,16	281,59	299,45	373,14	361,41
Sobrance	134,11	113,99	113,91	126,35	133,36
Spišská Nová Ves	255,07	287,41	367,31	370,94	394,26
Trebišov	231,96	322,49	252,39	236,75	310,43
Košice Region	276,58	294,61	285,03	320,42	329,24

Source: Statistical Office of the Slovak Republic

The largest amount of municipal waste per capita was produced in 2018 by the residents of the Spišská Nová Ves district (394.3 kg / capita), the city of Košice (377.6 kg / capita) and the Rožňava district (361.4 kg / capita). The



smallest amount of municipal waste per capita was in the districts of Sobrance (133.4 kg / capita), Gelnica (238.5 kg / capita) and Košice - okolie (244.6 kg/ capita).

Method of municipal waste management in the Košice Region in 2018 (in tons)

District	waste recovered			Landfilling	Municipal waste together
	Material recovery	Energy recovery from waste incineration	Recovery of organic substance		
Gelnica	599,62	-	1 783,51	5 189,46	7 572,59
Košice I - IV	15 188,94	56 998,29	12 466,45	5 602,15	90 255,83
Košice - okolie	4 702,75	15 916,07	2 265,95	8 415,29	31 300,05
Michalovce	9 375,97	-	4 986,46	22 193,38	36 555,81
Rožňava	3 269,15	-	2 254,69	16 981,46	22 505,30
Sobrance	364,44	-	133,12	2 543,28	3 040,84
Spišská Nová Ves	10 211,33	-	7 523,15	21 508,09	39 242,57
Trebišov	10 587,59	270,53	3 263,96	18 616,09	32 738,16
Košice Region	54 299,77	73 184,89	34 677,30	101 049,21	263 211,17

Source: Statistical Office of the Slovak Republic

In 2018, out of the total amount of 263,211.2 tons of municipal waste, a total of 162,162.0 tons was recovered in the Košice Region, which represents 61.6%.

Within the districts, the largest volume of recovered municipal waste was in the districts of the city of Košice (93.8% of the total amount of municipal waste in the district) and in the district of Košice - okolie (73.1%). The least recovered municipal waste is in the districts of Sobrance (16.4%) and Rožňava (24.5%).

In 2018, most waste was recovered in the districts of the city of Košice (28.0% of the total volume of recovered waste in the Košice Region), Trebišov (19.5%), Spišská Nová Ves (18.8%) and Michalovce (17, 3%). In 2018, municipal waste was recovered by energy incineration in only three districts of the Košice Region, while the highest share was in the districts of the city of Košice (77.9%). With the recovery of organic substances, municipal waste was recovered in 2018 mostly in the districts of the city of Košice (36.0% of the total volume of waste recovered in the Košice region) and in the district of Spišská Nová Ves (21.7%).

Municipal waste disposed of by landfill reached a volume of 101,049.2 tons in 2018, which is 38.4% of the total amount of municipal waste generated.

At the level of districts of the Košice Region in 2018, the highest share of municipal waste disposed of by landfilling was in the districts of Michalovce (22.0% of the total volume of disposed waste in the Košice Region), Spišská Nová Ves (21.3%), Trebišov (18.4%) and Rožňava (16.8%).

At the level of municipalities of the Košice Region, municipal waste was recovered in 2018 in all municipalities of the region, and the recovery of municipal waste by energy incineration was in 69 municipalities of the region (15.7% of the total number of municipalities in the region). The number of municipalities that disposed of municipal waste by landfill reached 416, i.e. 94.6%.

The amount of recovered waste in the Košice Region in 2018 according to individual components is listed in the following table, including the share of recovered components in the total amount of municipal waste.

Amount of recovered components from municipal waste in 2018

Ingredients	Quantity (t)	Share (%)
Paper, cardboard	8 995,8	3,4
Glass	6 781,7	2,6
Biodegradable kitchen and restaurant waste	16 299,7	6,2



Clothing, textiles	224,5	0,1
Batteries and accumulators	351,1	0,1
Wood (no hazardous substances)	828,9	0,3
Plastics	4 578,7	1,7
Metals	34 667,6	13,2
Biodegradable waste	16 415,3	6,2

Source: Statistical Office of the Slovak Republic

In the Košice Region, 162,162 tons of municipal waste was recovered in 2018 which represents a value of 202.84 kg per capita in the region. The amount of separated components of municipal waste reached the level of 75,460 tons, 94.39 kg per capita. The amount of disposed municipal waste per capita reached the value of 126.40 kg.

In the Košice Region, almost all municipalities are involved in separate collection. Most municipalities separated only the basic components - paper, glass, plastics and metals. Gradually, composite packaging, tires, waste from electrical equipment, car batteries, edible oils, small construction waste and also biodegradable waste from municipal waste began to be collected. The separated waste was collected in colored bags mainly at family houses in villages and towns, but also up to 1100 l containers near apartment buildings, or into three-component large-volume containers and in established collection yards in the towns of Spišská Nová Ves, Spišské Vlachy, Trebišov, Sečovce, Kráľovský Chlmec, Michalovce, Strážske, Rožňava, Dobšiná, Košice, Veľké Kapušany, Smolník and Gelnica. In some larger cities, several collection yards have been set up - e.g. the cities of Košice and Michalovce, Strážske. In towns and villages, certain methods of collecting sorted components of municipal waste are already used.

The region also collects biodegradable waste, the so-called "Green waste", which is composted in municipal composting sites in municipalities e.g. Veľký Folkmár, Smolník, Gelnica. In some cities e.g. in Michalovce, the town placed 1,000 house composters next to family houses. At the same time a new composting plant was approved in the town.

In 2019, there were a total of 17 landfills in the Košice Region, of which 10 landfills for non-hazardous waste, 4 landfills for inert waste, and 3 landfills for hazardous waste. Most of the landfills that are currently in operation have valid permits up to 2035. Their planned capacity should be filled by that time. Landfills for non-hazardous waste and landfills for hazardous waste are currently issued with integrated permits and are supervised by environmental inspectorate inspectors.

The total capacity of landfills in the Košice Region in 2019 was 375,090 m³, the free capacity reached the value of 95,795 m³. In 2019 total of 10,350 tons of waste was deposited in landfills in the Košice Region.

Operated facilities for recovery and disposal of waste and landfills

In 2019, 86 waste recovery facilities (R) and 21 waste disposal facilities (D) were registered in the Košice Region. An overview of facilities in the districts of the Košice Region is in the following table.

Facilities for the disposal and recovery of waste in the districts of the Košice Region in 2019

District	Device code	Number of devices
D - Disposal Operations		
Košice I	D1 Deposit into or onto land, e.g. landfill	1
Košice II	D1 Deposit into or onto land, e.g. landfill	3
Košice - okolie	D1 Deposit into or onto land, e.g. landfill	1
Michalovce	D1 Deposit into or onto land, e.g. landfill	2
Michalovce	D1 Deposit into or onto land, e.g. landfill	2
	D2 Land treatment, e.g. biodegradation of liquid or sludgy discards in soils	
	D13 Blending or mixing prior to submission to any of the operations numbered D1 to D12 (b)	
	D15 Storage pending any of the operations numbered D1 to D14 (excluding temporary storage,	



	pending collection, on the site where it is produced) (c)	
Michalovce	D2 Land treatment, e.g. biodegradation of liquid or sludgy discards in soils	1
Michalovce	D8 Biological treatment resulting in final compounds or mixtures which are discarded by any of the operations numbered D1 to D12 D9 Physico-chemical treatment resulting in final compounds or mixtures which are discarded by any of the operations numbered D1 to D12, e.g. evaporation, drying, calcination	1
Michalovce	D10 Incineration on land	1
Rožňava	D1 Deposit into or onto land, e.g. landfill	2
Sobrance	D1 Deposit into or onto land, e.g. landfill	1
Spíšská Nová Ves	D1 Deposit into or onto land, e.g. landfill	1
Spíšská Nová Ves	D10 Incineration on land	1
Trebišov	D1 Deposit into or onto land, e.g. landfill	4
R - Recovery Operations		
Gelnica	R12 Exchange of wastes for submission to any of the operations numbered R1 to R11 (3)	1
Košice I	R4 Recycling/reclamation of metals and metal compounds	1
Košice I	R12 Exchange of wastes for submission to any of the operations numbered R1 to R11 (3) R13 Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) (4)	2
Košice II	R1 Use principally as a fuel or other means to generate energy	1
Košice II	R4 Recycling/reclamation of metals and metal compounds R13 Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) (4)	3
Košice II	R5 Recycling/reclamation of other inorganic materials (2) R12 Exchange of wastes for submission to any of the operations numbered R1 to R11 (3) R13 Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) (4)	1
Košice II	R12 Exchange of wastes for submission to any of the operations numbered R1 to R11 (3)	3
Košice II	R12 Exchange of wastes for submission to any of the operations numbered R1 to R11 (3) R13 Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) (4)	2
Košice IV	R3 Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) (1)	2
Košice IV	R3 Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) (1) R13 Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) (4)	2
Košice IV	R5 Recycling/reclamation of other inorganic materials (2)	1
Košice IV	R5 Recycling/reclamation of other inorganic materials (2) R13 Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) (4)	2
Košice IV	D9 Physico-chemical treatment resulting in final compounds or mixtures which are discarded by any of the operations numbered D1 to D12, e.g. evaporation, drying, calcination D10 Incineration on land D13 Blending or mixing prior to submission to any of the operations numbered D1 to D12 (b) D14 Repackaging prior to submission to any of the operations numbered D1 to D13 D15 Storage pending any of the operations numbered D1 to D14 (excluding temporary storage, pending collection, on the site where it is produced) (c) R10 Land treatment resulting in benefit to agriculture or ecological improvement R12 Exchange of wastes for submission to any of the operations numbered R1 to R11 (3) R13 Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) (4)	1
Košice IV	R12 Exchange of wastes for submission to any of the operations numbered R1 to R11 (3)	1
Košice IV	R12 Exchange of wastes for submission to any of the operations numbered R1 to R11 (3) R13 Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) (4)	7
Košice - okolie	R1 Use principally as a fuel or other means to generate energy	2
Košice - okolie	R3 Recycling/reclamation of organic substances which are not used as solvents (including	2



	composting and other biological transformation processes) (1)	
Košice - okolie	R4 Recycling/reclamation of metals and metal compounds	1
Košice - okolie	R5 Recycling/reclamation of other inorganic materials (2)	4
Michalovce	R3 Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) (1)	1
Michalovce	R4 Recycling/reclamation of metals and metal compounds	1
Michalovce	R5 Recycling/reclamation of other inorganic materials (2)	2
Michalovce	R9 Oil re-refining or other reuses of oil	1
Michalovce	R12 Exchange of wastes for submission to any of the operations numbered R1 to R11 (3) R13 Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) (4)	10
Michalovce	D2 Land treatment, e.g. biodegradation of liquid or sludgy discards in soils D15 Storage pending any of the operations numbered D1 to D14 (excluding temporary storage, pending collection, on the site where it is produced) (c) R3 Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) (1) R12 Exchange of wastes for submission to any of the operations numbered R1 to R11 (3) R13 Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) (4)	2
Rožňava	R5 Recycling/reclamation of other inorganic materials (2)	2
Rožňava	R4 Recycling/reclamation of metals and metal compounds R13 Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) (4)	1
Rožňava	R12 Exchange of wastes for submission to any of the operations numbered R1 to R11 (3) R13 Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) (4)	2
Rožňava	R1 Use principally as a fuel or other means to generate energy R12 Exchange of wastes for submission to any of the operations numbered R1 to R11 (3) R13 Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) (4)	1
Rožňava	R3 Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) (1) R12 Exchange of wastes for submission to any of the operations numbered R1 to R11 (3) R13 Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) (4)	2
Sobrance	R3 Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) (1)	1
Sobrance	R10 Land treatment resulting in benefit to agriculture or ecological improvement	1
Spišská Nová Ves	R1 Use principally as a fuel or other means to generate energy R9 Oil re-refining or other reuses of oil	1
Spišská Nová Ves	R3 Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) (1) R13 Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) (4)	1
Spišská Nová Ves	R4 Recycling/reclamation of metals and metal compounds	4
Spišská Nová Ves	R4 Recycling/reclamation of metals and metal compounds R12 Exchange of wastes for submission to any of the operations numbered R1 to R11 (3) R13 Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) (4)	1
Spišská Nová Ves	R5 Recycling/reclamation of other inorganic materials (2)	2
Spišská Nová Ves	R9 Oil re-refining or other reuses of oil	1
Spišská Nová Ves	R12 Exchange of wastes for submission to any of the operations numbered R1 to R11 (3)	2
Trebišov	R3 Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) (1)	4
Trebišov	R4 Recycling/reclamation of metals and metal compounds	1
Trebišov	R5 Recycling/reclamation of other inorganic materials (2)	3



- (a) This activity is prohibited by legally binding acts of the European Union and international conventions.
- (b) If no other D-code is appropriate, this may include pre-disposal operations, including pre-treatment, as well as, inter alia, sorting, crushing, pressing, pelletising, drying, shredding, conditioning or sorting before any D1 to D12 operation.
- (c) § 3 par. 5 of Act no. 79/2015 Coll.
- (1) This includes gasification and pyrolysis using components as chemicals.
- (2) This also includes soil cleaning, which results in its restoration, and recycling of inorganic building materials.
- (3) Unless there is another suitable R-code, this may include pre-recovery operations, including pre-treatment, including, but not limited to, disassembly, sorting, crushing, compression, pelletisation, drying, shredding, conditioning, repackaging, sorting, mixing and mixing before by subjecting any of the activities R1 to R11.
- (4) § 3 par. 5 of Act no. 79/2015 Coll.

Source: Ministry of the Environment of the Slovak Republic

5.2.5. Opportunities of the circular economy by sector

Based on the leading sectors in terms of number of enterprises and employment in the Košice Self-governing Region area, there are several sector-specific opportunities for the Košice Self-governing Region economy to circulate more.

AGRIFOOD

Agrifood is important for the Košice Self-governing Region and Prešov Self-governing Region Region in terms of the number of companies and the food services sector is one of the larger employers. Food and beverages are the sector that usually contributes the most to the generation of commercial waste, and kitchen waste is generally considered to be a significant problem which, if addressed proactively, can bring economic benefits (waste prevention). The key point is that waste prevention usually brings benefits not only in terms of waste management costs, but more importantly, in preventing raw material costs (which are usually about 20 times higher for the sector). The waste hierarchy should be respected, with:

- The priority is to avoid avoidable food waste. There is potential to achieve this goal in the sector, but also through household expansion through innovations such as extended storage and shelf life. There are also opportunities on farms to reduce food losses through appropriate storage, pest / disease protection and the involvement of multiple supply chains to reduce waste due to problems such as unsatisfactory specifications and mismatches between supply and demand.
- Reuse/redistribution of food surplus. For example, FareShare Northern Ireland, a charity operating throughout Northern Ireland, redistributes surplus food and calculates a social and economic return on investment of 8 GBP for every 1 GBP invested in its work.
- Any food waste that cannot be prevented or reused / redistributed can be separated for use in anaerobic digestion or composting plants, which generate beneficial products that can be used in food cultivation and thus recirculated to agriculture. Anaerobic digestion has another advantage in energy production.

Other opportunities for the circular economy in the agrifood sector include:

- Leasing models of capital equipment: there is the possibility to adopt leasing models for capital equipment for both kitchens / food preparation and agriculture, which could allow the use of the latest intelligent kitchen technology and more efficient use of resources.
- Sustainable agriculture: In agriculture, there are opportunities to reduce external inputs, especially those imported, such as animal feed, which move towards a closed-loop system and focus on the principles of sustainable intensification, thus increasing outputs while the environment and ecosystem services are protected.
- Shortening agricultural supply chains: As an agricultural area, there is also an opportunity to shorten supply chains and reduce consumer packaging and transport by encouraging residents to buy locals and farmers to sell local products.



HUMAN HEALTH AND SOCIAL WORK

In the health sector, there is considerable scope for improving waste management, in particular:

- Reduction of food waste that can be prevented in hospitals: currently the largest source of hazardous waste is in healthcare. This could be facilitated by redesigning food supply and disposal services and good communication to avoid unnecessary food preparation.
- Renovation and preparation for reuse: covers all ranges from consumables to equipment. For example, reusable diapers in hospitals can bring significant waste reductions and cost savings, as well as the renovation of large capital facilities. Another good example is the continuation of the collection of unused hospital equipment for re-use.
- Recycling: plastic is a large component of hospital waste, much of it is not hazardous with recycling potential.

Another concept of the circular economy that can be applied in healthcare is the use of procurement models in which consumers pay for the use of equipment and not for the purchase of products in advance. This leads to savings in initial costs, maintenance and post-use treatment. This type of procurement is already taking place in many hospitals, especially in Germany.

WHOLESALE AND RETAIL

The wholesale and retail sectors can facilitate the transition to a circular economy in several ways:

- Packaging: retailers are in a position to rework packaging to reduce volume advantageously while also reducing costs;
- New business models: for example, take-back systems for the repair and refurbishment of end-of-life products.
- Design: the use of upstream - a pre-emptive effect on the transition to products that are more circular, for example with a longer service life.
- Suppliers: Similar to green public procurement in the public sector, the private sector can only contract with suppliers who meet certain criteria regarding waste reduction and the circular economy.
- Consumption patterns: consideration of price points and promotions that influence more sustainable shopping behavior.

The Fashion and Textile Design Center, established with the support of the Košice Self-governing Region, is a way in which the Košice Self-governing Region could influence the design of retail products. For example, the center could be tasked with finding innovative ways to reduce waste and move fashion and textiles to the circular economy - a movement with the potential to re-establish the Košice Region's historic textile industry.

EDUCATION

As outlined in the policies below, education plays a key role in the transition to a zero-waste circular economy, and educational institutions can be used to disseminate information on the strategy. The education sector also plays an important supporting role in providing a skilled workforce in areas needed for the circular economy, such as refurbishment, refurbishment and product design. According to EU models, our secondary technical and business academies can offer a number of courses with the potential to acquire skills in the circular economy, such as construction and design courses, as well as TUKE -UVP TECHNCOM, where these courses can include creative technology and engineering. Simultaneous provision of opportunities to increase qualifications in the test center TUKE - BERG Associate Professor Spišák may expand in the future based on the volume of material with increasing potential for



re-use and the potential to prepare for re-use of higher value-added items, which requires specialist skills and greater financial returns.

PRODUCTION

If high-quality recycled material is generated at the Košice Region from its municipal waste collection system and from the municipal waste recycling centres, start-ups will have the opportunity to start reprocessing this secondary material. As there are already processors in the Košice and Prešov Region who are likely to provide clear markets for certain materials with a focus on materials that are not currently reprocessed in the SR, they can offer to the Košice Region greatest business opportunities. There are a number of "problem waste streams" that will need to be addressed in the coming years as they move from the use phase to the waste stream. Examples that are worth considering include solar panels, carbon fiber products, new battery technologies, LED lights and other products. None of these flows can be delivered to a large number of reprocessing facilities, as the amount of material available will not be sufficient to justify the types of investments that are likely to be required of the investment requested. As a result, cities with multimodal HUBs will acquire a certain strategic importance and become sites of potential aggregation of waste materials and products that contain valuable materials. Therefore, there are opportunities to identify waste streams, the reworking of which links to other aspects of the economy and where the Košice Region area can become a serious player in Central and Eastern Europe.

There are opportunities for existing manufacturing operations in this area to become more circulating, including by designing products for longer life and shifting towards consumption patterns that are not based on direct ownership (using leasing models). Greater emphasis on reuse design, recyclability and evaluation of space to increase process efficiency and eliminate waste in production are also important activities that can bring benefits at the lower end.

CONSTRUCTION

The circular economy offers many construction opportunities. The design of new buildings and the choice of materials should be based on circular economy concepts such as durability, dismantling and flexibility, in order to keep buildings and resources in operation for as long as possible. As a procurer of construction services, the Košice Region has the opportunity to influence the practices of the circular economy in construction, especially through the ecological procurement of buildings financed by Košice Self-governing Region and Prešov Self-governing Region. Košice Region has other options through a planning system to influence ecological design in construction and by leaving the bond to ensure that standards are met in the final construction. There are many practices relevant to both the public and private sectors:

- Selective demolition could lead to increased savings through the take-back and reuse of materials such as wood and structural metal, waste separation and high quality recycling of building elements. This is a particularly important attractive outlook for the Košice and Prešov Region, as they could help strengthen the repair and maintenance industry.
- Use of industrialized production processes, modularization and 3D printing to reduce construction and renovation costs and time.
- Leasing materials for use. This would open up new business opportunities for the provision of leased, recycled materials for new construction work.
- Sharing, multipurpose and reuse buildings.
- In this area, there are opportunities to work with construction companies to help them identify practices, including support under contracts, that promote a less uneconomical approach to construction.



5.3. SPECIFIC CHALLENGES IN SLOVAKIA AND IN THE KOŠICE REGION

In 2017, the European Commission recommended to Slovakia to focus on improving waste management, especially on increasing recycling, strengthening separate waste collection and other activities that will reduce landfilling. With these intentions, Slovakia approved the Waste Prevention Program for 2019-2025 and the Environmental Policy Strategy until 2030. These documents commit the Ministry of the Environment of the Slovak Republic to the preparation of the legislative environment for:

- application of mandatory fees of households according to the amount of waste produced (PAYT),
- waste collection (door to door),
- support for local backup systems,
- support for the take-back of waste from products,
- support for home and community composting,
- compulsory collection of kitchen waste from households,
- activities for the prevention of food waste,
- building re-use centers and a national waste prevention education program.

And in recent years, the Slovak Republic has been experiencing a legislative storm in order to increase recycling and reduce the amount of landfilled waste. Since January 2019, an amendment to the Act on Fees for Landfilling Waste has been in force and a government regulation has set the rates of fees for landfilling waste, which is based on the level of municipal waste sorting in individual municipalities. At the same time, the fee is increasing year-on-year in order to ensure the motivation of the municipality to increase the level of classification. In November 2019, an amendment to the Waste Act abolished three of the four exemptions for compulsory separate collection of kitchen waste. From 2023, kitchen waste must also be sorted by those municipalities that have used mixed municipal waste for energy, or those to which the introduction of separate collection would cause technical problems (especially in historic city centers and sparsely populated areas). Since 2021, municipal waste must also be sorted by municipalities, which have referred to the economic intolerance of sorting kitchen waste. Only municipalities or parts of municipalities do not have to sort kitchen waste, which proves that 100% of households compost kitchen waste on their own.

To meet the goals of the Slovak Republic in waste management (increasing the rate of recycling of municipal waste and packaging waste, reducing the share of landfills) to present system solutions based on efficiency and transparency (according to INEKO).

- Improve and make more flexible the regulation of the waste management sector; if the current regulation does not comply, propose a more effective one.
- Take measures to maximize the achievement of waste collection and recovery objectives that, based on analyzes, lead most effectively to the result (collection of sorted components, collection of plastic bottles and cans, sorting of biodegradable waste, treatment of kitchen waste).
- Efficient use of capacities for sorting unsorted municipal waste and disposal of non-recyclable waste (incinerators, cement plants); support new capacity building only while respecting objectives in the whole environmental sector, on the basis of transparent processes and taking into account their future effectiveness.
- Support effective sorting and recovery of municipal waste not included in the system of sorted collection by effective tools, motivate municipalities to minimize landfilling of waste.
- Strengthen tools for waste prevention and intensification of waste sorting (e.g. bulk collection - payment for the amount of mixed waste); choose the ones that bring the highest efficiency.
- Streamline and make transparent support and subsidy schemes in waste management (for example from the Environmental Fund, the EU Structural Funds), assess the effectiveness of the use of funds before they are granted and evaluate their real impact after their use.
- Use measures in the system of taxes and fees that will motivate producers to reduce waste production and market products with a low environmental burden.
- When adopting new laws in waste management, take into account the principle of value for money, pay attention to their precision (use modeling before the adoption to avoid the need for frequent forced changes, monitor European legislation more closely) in order to make the legislative environment more stable; apply the same to investments.



- Prevent the creation of illegal landfills by expanding the availability of legal waste collection and applying effective sanctions for breaches of the law; effectively dispose of existing illegal landfills.
- Promote effective measures to raise public awareness of the need for efficient waste management, including waste prevention; with this intention to introduce environmental education into school curricula.
- Actively enter into the creation of the environmental policy of the European Union, presenting solutions respecting the possibilities and needs of the Slovak Republic.
- Promote the efficient allocation of resources from the European Union to contribute to real progress in the circular economy and waste management in the Slovak Republic.

At the same time, the Slovak Republic must pay sufficient attention to the support of innovations for low-carbon, including those belonging to the circular economy. In the current situation, it is necessary to support the development of innovative and new products and services, the transfer of technologies and knowledge into practice, process innovation and the creation of networks for information sharing. To this end, it will be necessary to support:

- quality research, experimental development with a high potential for the transfer of acquired knowledge into society, especially in order to build a competitive business sphere,
- active cooperation between companies, research and development centers, education and public authorities,
- increasing research capacities and innovative absorption capacity within the business sector,
- help domestic companies to participate in international value chains, including innovative ones.

5.4. AIM OF THE PROJECT AND ITS GOALS

5.4.1. Aim of the project

The circular economy will require a comprehensive approach, disrupting the existing consumption system and has significant potential to reduce greenhouse gas emissions.

The main obstacles are sometimes high re-use and repair costs, lack of understanding of re-use, lack of cross-sectoral or sectoral purchasing, poor and complex product design, inability to monetize hidden environmental costs of products and lack of long-term thinking.

Key opportunities include public procurement, new business approaches and models, the use of growing environmental awareness to stimulate behavioral change, existing support for education (see Regional Skills Forum below), exciting research (see below) and new ecodesign legislation.

The circular economy will require skills and jobs at all skill levels in rural and urban communities and could help revitalize sectors such as crafts or local production (see Green Alliance presentation below). To support growth in this area, tertiary institutions need to assess all courses for circular economy opportunities, address the current skills mismatch and look at technology, STEM and data as part of the overall picture.

Our common regional role is to take steps to:

- Creating opportunities to share best practices, knowledge and tools;
- Sharing knowledge initiatives and supporting the interconnection of companies in the regions of both countries;
- Coordinating efforts in organizing circular events;
- Support for cross-sectoral but also international cooperation in the topics of the circular economy.
- To create suitable conditions for the creation of innovations in the field of circular economy.



5.4.2. Priority areas and activities

From the above, the following specific areas were identified, within which the Košice self-governing region with its partners can ensure the transition to a low-carbon and circular economy.

1. CHANGE OF PUBLIC OPINION ON THE CIRCULATING AND LOW CARBON ECONOMY, WITH AN EMPHASIS ON ATTITUDES TOWARDS A GLOBAL ACCESS TO THE CIRCULATING ECONOMY AND ITS OPPORTUNITIES

The basic problem of the transition to a circular economy is the low knowledge of the public, including the business community, about the topicality and opportunities associated with the transition to a low-carbon and carbon economy. For this reason, it is appropriate to introduce communication channels and campaigns in order to change society's attitudes in this area - e.g. through the Information and Consultation Point for the circular economy, awareness-raising and networking of supporters and disseminators of ideas and promoters of the principles of the circular economy (from citizens, municipalities, the corporate sector, education and research organizations, but also the non-profit sector). It is also necessary to build capacity and share good examples from abroad, and last but not least, to ensure the availability of experts for the establishment of innovative partnerships in the field of low-carbon and circular economy in the region.

Activities to be implemented:

- a) Preparation of the organizational unit providing information point and channel services
- b) Preparation and implementation of the program and channels of educational activities
- c) Preparation and implementation of the capacity building program and channels (trainings)
- d) Preparation and implementation of a program and channels for sharing good examples from abroad
- e) Preparation and launch of an innovation platform and database of domestic experts and R&D workplaces and offices dedicated to the field of waste / low carbon / circular economy

2. STRENGTHENING THE ROLE OF THE KOŠICE REGION WITH REGARD TO EFFECTIVE WASTE REDUCTION AND PROMOTION OF CIRCULATION IN PUBLIC ADMINISTRATION ORGANIZATIONS

In order to demonstrate leadership in the circular economy, the functioning of the Košice self-governing region and its established organizations should be reborn into processes leading to the circular economy, which would mean the introduction of waste-free offices, but also the minimization / use of waste in a wide range of processes, construction of roads, bridges, etc. The change is feasible in the form of a change in internal goals, rules and procedures for the Košice Region organization and its subordinate organizations.

Activities to be implemented:

- a) Identification of possibilities and impacts for changes in the functioning of the Košice Region and its established organizations with the aim of introducing circulatory approaches.
- b) Identification of suitable areas for introducing change to the circular economy.
- c) Proposal to change internal objectives, rules and procedures and their implementation.
- d) Promotion of guidelines / recommendations to other public bodies

3. CREATION AND DEVELOPMENT OF ECOSYSTEM PREPARED FOR THE UPCOMING CIRCULAR AND LOW CARBON ECONOMY.

In order to accelerate the transition to a low-carbon and circular economy, it is important to implement targeted interventions in the form of technological and process investments in the socio-economic environment. As a result, it is necessary to examine the suitability of various available technological and non-technological innovations based on low-carbon and circular economy in key sectors of the Košice Region in accordance with its strengths and global trends. This requires active communication and a series of meetings with relevant players in the region, at the national level, but also in the international arena (in the absence of expertise). Subsequently, it is necessary in active cooperation with development actors to develop an overview of suitable investment project plans applying the principles of the circular economy to increase the quality of life in the Košice Region, which would represent a list of practical changes financing from structural and other relevant funds.



Activities to be implemented:

- a) Analysis of the nature of the economic environment and the possibility of applying technological and non-technological innovations of the circular economy in key sectors of the Košice Region. Identification of suitable sectors for the transition to a circular economy.
- b) Co-creation process with regional stakeholders to identify the suitable operational plan for ecosystem, the strategic actions to be taken and the list of project proposals (pool of ideas, pilots, scale-up) to increase the quality of life in the Košice Region.
- c) Search for funding (internal/external) for operation of ecosystem, implementation of identified strategic actions and project proposals
- d) Formulation of recommendations for national support schemes and active participation in the creation of schemes for the next programming period in order to support the financing of identified project intentions.

5.5. HUB AND ECONOMIC SUSTAINABILITY

As part of the design activities, it is planned to establish an Information and Consultation Point for the circular economy, which would cover several activities - from raising awareness and networking supporters and disseminators of ideas and promoters of circular economy principles, through conducting capacity building programs and sharing good examples from abroad, to support the establishment of innovation partnerships in the field of low-carbon and circular economy in the region.

The existence of a center of the circular economy (so-called Hub) with competencies and resources (financial and human) for the promotion and support of potential projects will greatly facilitate the transformation of society and industry and the use of OE resource potential in Eastern Slovakia. The Center should focus in particular (but not only) on reducing food waste and promoting local healthy food chains to enable the circular economy, direct links with businesses across the bioeconomy sectors, policy makers, third sectors, consumers and other relevant communities and stakeholder parties.

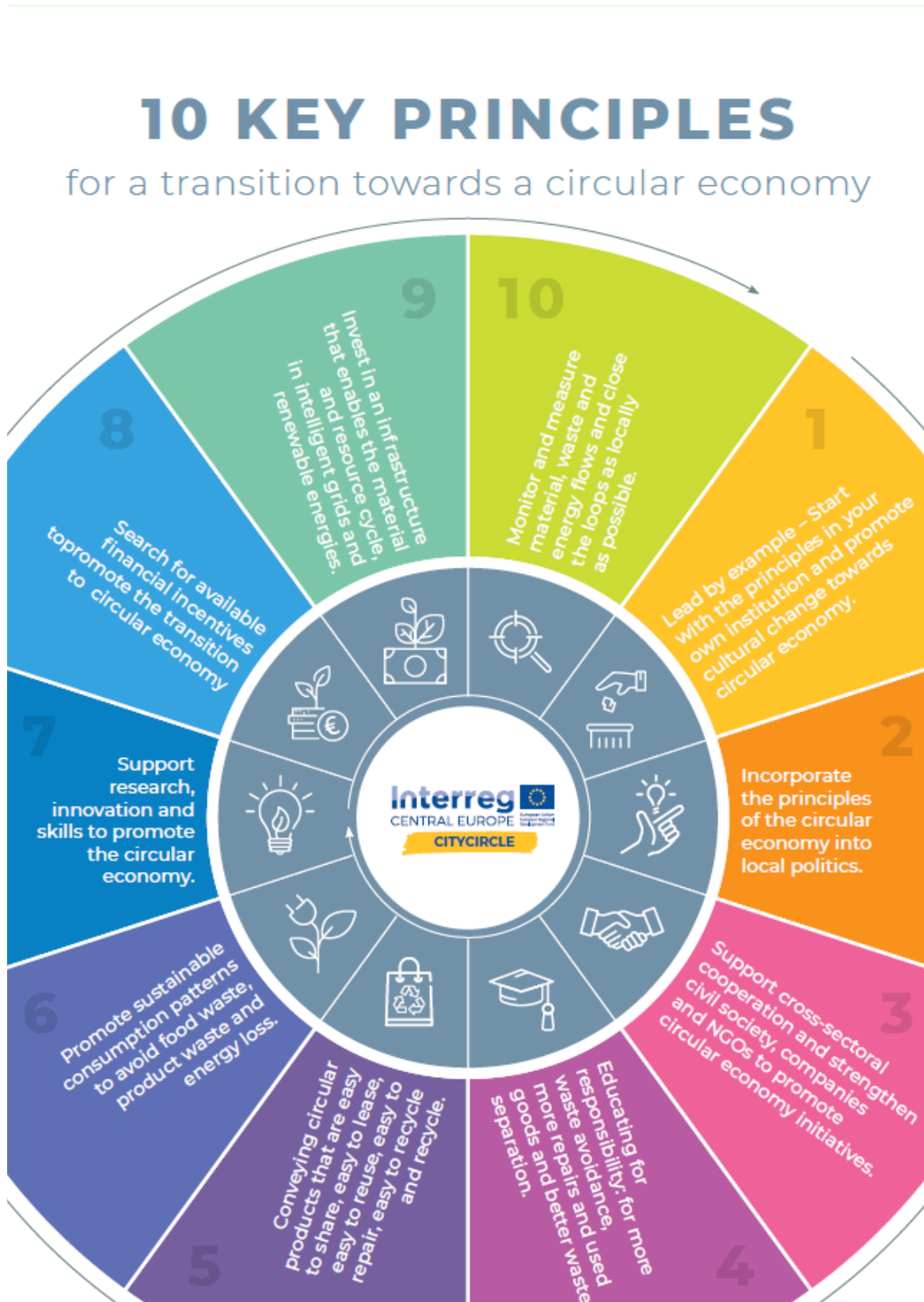
In general, the center should function as an effective regional innovative incentive tool to help seek opportunities and disseminate and exploit the results of applied research and development in the circular economy, better understand and reconfigure the whole raw material, waste and waste flow system and change business practices, supply chains and market business structures.

The Centre's activities will be complemented by a dedicated digital platform to ensure awareness-raising campaigns, dissemination of knowledge, inspiration for actors to adopt good practice and networking between partners to support the emergence of application and innovation partnerships.



6. ANNEXES

- Manifest - graphical version





- Manifest - signing page

Signatories of this manifest confirm
their commitment to make efforts to the



10 KEY PRINCIPLES

for a transition towards a circular economy

1. Lead by example – Start with the principles in your own institution and promote cultural change towards circular economy.
2. Incorporate the principles of the circular economy into local politics.
3. Support cross-sectoral cooperation and strengthen civil society, companies and NGOs to promote circular economy initiatives.
4. Educating for responsibility: for more waste avoidance, more repairs and used goods and better waste separation.
5. Conveying circular products that are easy to share, easy to lease, easy to reuse, easy to repair, easy to recycle and recycle.
6. Promote sustainable consumption patterns to avoid food waste, product waste and energy loss.
7. Support research, innovation and skills to promote the circular economy.
8. Search for available financial incentives to promote the transition to circular economy.
9. Invest in an infrastructure that enables the material and resource cycle, in intelligent grids and renewable energies.
10. Monitor and measure material, waste and energy flows and close the loops as locally as possible.

Organisation:

Address:

Name and surname:

E-mail:

Place and date:



Signature