

REGIONAL ACTION PLAN TO EXPAND SRM MARKETS

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CIRCE2020

MAKE IT CIRCULAR !!!





1. Introduction

A circular economy is rational, low-carbon, innovative and competitive.

The basis of the circular economy concept is the assumption that all elements of the production chain, products, materials and raw materials remain in circulation as long as possible. However, the generation of waste should be kept to a minimum.

The transition to a circular economy model requires taking appropriate measures at all stages of the product life cycle, starting from obtaining raw materials, through design, production, consumption, waste collection and management. The implementation of the circular economy concept is not possible without organizational, process and product innovations.

Although it seems complicated in theory, it is already happening in practice. What well developed so far under the banner of green economy or sustainable development is "closing the loop". It is the use of solar energy, biodegradable dishes, reducing packaging, the use of reusable bags, the recovery of recyclable materials - this is what circular economy is all about.

The basic concept of sustainable development - which is still valid today - was adopted at the General Assembly of the United Nations (UN), entitled "Our Common Future".

Industrial symbiosis, by increasing resource efficiency, is precisely aimed at aligning economic growth with environmental goals, while at the same time contributing to the development of social equality through a new approach and employment opportunities generated by new, systematic industrial cooperation.

At the 2015 World Summit on Sustainable Development, UN sets targets for the eradication of poverty and the building of a sustainable future by 2030. By addressing these three main elements of sustainability, the Program identifies 17 target areas and a number of specific targets within them. Industrial symbiosis can be linked to or contribute to the development and achievement of the 17 target areas shown in the well-known figure below.



Figure - Sustainable Development Goals (SDGs)

There is a clear link between industrial symbiosis and its importance in achieving the goals of “decent work and economic growth” (8), “industry, innovation and infrastructure” (9), “sustainable cities and communities” (11), “responsible consumption and production” (12), contributing substantially to the individual development directions of each target area.

In addition to increasing productivity and creating jobs, it supports the reduction of environmental impact, the transition to sustainable consumption and production processes, the improvement of resource efficiency, the development of appropriate resource management and the use of environmental friendly and innovative technologies. Sustainable consumption and production goals - sustainable management of natural resources, good management of chemicals, life-cycle waste management, or even food waste reduction - are explicit targets of industrial symbiosis.

To achieve the global sustainability goals, the European Commission has developed a comprehensive program to keep resources in the economic cycle, which was submitted in December 2015 to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, entitled “Closing the loop - An EU action plan for the circular economy”. According to the Communication, the action plan will effectively contribute to achieving the UN SDGs by 2030, in particular the “responsible consumption and production” (12) target.



Figure - Concept of circular economy

The new Circular Economy Action Plan (part of the European Green Deal) which was published by the European Commission - in line with the SDGs - provides plans how Europe can achieve a climate-neutral, resource-efficient and competitive economy in cooperation with economic actors, consumers, citizens and civil society organizations by 2050.

Another is The Circular Plastics Alliance. This initiative aims to boost the EU market for recycled plastics to 10 million tonnes by 2025. The alliance covers the full plastics value chains. The Circular Plastics Alliance is open to all public and private actors from European plastics value chains that are ready to actively contribute to delivering CE solutions and results. The vision of the Circular Plastics Alliance is to deliver on the circular economy for plastics and substantially increase the use of recycled plastics into new products.





The Circular Plastics Alliance endorses the ambitious target that by 2025 at least 10 million tonnes of recycled plastics should find their way into products and packaging in Europe each year (hereafter referred to as "the 10 million tonnes target"), helping to deliver the circular economy with a life cycle approach. Plastics and plastic waste are valuable resources for the circular economy. Increasing collection of plastic waste for recycling contributes to reducing plastic pollution.

These CE actions are in close connection with some CIRCE2020 project goals and the Polish „Road Map Transformation towards a circular economy” and “The Development strategy of the Greater Poland Voivodeship until 2030” which are going to be explained in details in this document.

2. Overview

2.1. National level.

“The circular economy road map”.

That is a document containing a set of tools, not only legislative, aimed at creating conditions for the implementation of a new economic model in Poland. The proposed activities relate primarily to analytical and conceptual, information and promotional and coordination works in the areas within the competence of individual ministries.

Chapter I "Sustainable Industrial Production" is to draw attention to the important role of industry in the Polish economy and to new opportunities for its development. Chapter II "Sustainable Consumption" shows how much potential exists at this - so far often overlooked - phase of the life cycle. Chapter III "Bioeconomy" concerns the management of renewable resources (the biological cycle of circular economy), which in the Polish realities have great potential. Chapter IV "New business models" indicates the possibilities of reorganizing the ways of functioning of various market participants based on the idea of circular economy. Chapter V concerns the implementation and monitoring of circular economy.

It should be emphasized that we are not starting from scratch in Poland. Both public administration and scientific institutions and entrepreneurs have been implementing individual elements of circular economy for many years, although they often call them differently. Activities implemented so far under the slogan of green economy, cleaner production, sustainable development or low-emission often contribute to "closing the loop", because their primary goal is often that the product is produced and used as efficiently as possible, and that waste is optimally managed economically and environmentally.

In view of the depletion of non-renewable resources, the increase in their prices and the growing dependence of Poland on their supplies from abroad, which creates risks for the further economic development of the country and challenges in the context of environmental protection, it was necessary to immediately take action by the public sector. In this context, supporting the



transformation towards circular economy was an essential element of creating a low-emission, resource-efficient, innovative and competitive Polish economy.

Transformation towards circular economy requires taking action at all stages of the life cycle, starting from product design, through raw material acquisition, processing, production, consumption, waste collection and its management. Circular economy thus differs from the linear economy model, based on the principle of "take - produce - consume - dispose of". In the circular economy approach, if waste is generated, it should be treated as secondary raw materials and used for re-production. Mechanisms at an earlier stage in the life cycle are intended to serve this purpose. The circular economy approach is inextricably linked with the development of innovation, creating new business models and increasing the environmental awareness of the society, which in turn contributes to increasing the competitiveness of the Polish economy in relation to our partners from other parts of Europe and the world.

Poland's priorities within circular economy include:

- Innovation, strengthening cooperation between industry and the science sector, and, as a result, the implementation of innovative solutions in the economy.
- Create a European market for secondary raw materials where it is easier to move them.
- Provision of high-quality secondary raw materials that result from sustainable production and consumption.
- Development of the service sector.

2.2. Regional level

“Development strategy of the Greater Poland Voivodship until 2030”

The strategy is a response to the challenges facing Wielkopolska. Globalization and revolution economic and technological - the development of industrial and digital technologies - are changing the way the functioning of economies and societies. Thanks to modern technologies, efficiency increases and productivity of economies. The challenge is to improve the quality and efficiency use of human capital.

Wielkopolska will change over the next decade thanks to innovations, but not only digital or technological, but also social. Support will be crucial economic entities to conduct research at the highest level and easier entry to the market with an innovative product, intensifying the links and flows between education and the economy and taking bold initiatives. By using the advantages of achievements scientific and technical, development of the economy of Wielkopolska and improvement of living conditions will take place under conditions of more sustainable, environmentally friendly and low-carbon growth.

All inhabitants of Wielkopolska should be able to benefit from innovation and positive effects economic progress. But residents also need to be persuaded to adopt new lifestyles, work and communication.



Improving living conditions while respecting the protection of the natural environment, counteracting and adapting to climate change and counteracting territorial inequalities to challenges that the Voivodship Self-Government undertakes with the goal of infrastructure development with respect for the natural environment of Wielkopolska. It means creating by the Local Government

Voivodeships for free access to basic and advanced goods and services, free movement of residents, business opportunities and supporting the development of an innovative economy, a dignified life for present and future generations, housing in a clean and safe natural environment.

An important element of environmental protection is proper waste management, which means implementing a circular economic model. Provincial government will be supported the development of existing and planned installations equipped with equipment for the recovery of raw materials, materials or energy, continuation of building a network of separate waste collection points municipalities, as well as closing and rehabilitation of landfills that do not meet the protection requirements environment. Initiatives to extend the life of products such as construction are also key network of repair and reuse points, activities in the field of preventing the waste of goods, food at the stage of its production, processing and consumption.

The development of the region's innovative economy and the improvement of the living conditions of Wielkopolska are intertwined with the need to reduce environmental (sustainable reduction of pollution) and social costs(costs incurred by households, institutions and enterprises). They refer to politics Europe related to low-carbon emissions, green investments, adaptation to changes climate.

Action Package:

Modern society produces more and more material goods, the consequence is increasing the amount of waste generated both during the production of goods and after their use. It is essential taking actions to reduce and utilize them. The most important investments identified within this package are, among others:

- Modern closed-loop waste management

The aim of the activities undertaken in this package will be the development of selective waste collection systems municipalities in municipalities in accordance with the waste management hierarchy, development of treatment installations bio-waste, recycling of recovered materials from waste, and processing installations hazardous waste. In terms of reducing the amount information and education is essential for proper handling of municipal waste and shaping the appropriate attitudes of the inhabitants of the region in the pro-ecological and sustainable direction consumption.

- We eat, we don't throw it away

The aim of the project is to increase the awareness of the inhabitants of Wielkopolska about social effects, economic, ecological and ethical waste of food.



3. General goals

The implementation of CE solutions requires a number of actions at the national and regional level. Most importantly, create the conditions for creativity and innovation in the supply chain participants. Many market participants recognize the need to introduce changes to the way they operate and that change is inevitable. The main goal should be not to prevent them from being creative.

We can distinguish several key areas and characterize basic goals for each of them.

3.1. Sustainable industrial production.

The condition for the development of industry is obtainable as a production price. Since 2011, in Poland, one can see an increase in resource productivity and the separation of resources, ie GDP growth with a simultaneous decline in domestic consumption (DMC - domestic material consumption). Due to the high share of industry in GDP, resource productivity measured as the quotient of GDP and domestic opinion consumption (DMC) is still relatively lower compared to countries with a lower industry inspector in GDP.

The idea of sustainable production is based not only on the principle of increasing resource productivity, i.e. reducing the amount of raw materials used per unit of produced goods, but also on the assumption of reducing the negative environmental impact of production processes, in particular in the context of reducing greenhouse gas emissions and the amount of waste generated.

1. Waste from processing industry and energy - Out of the total amount of waste (other than municipal) generated in 2017, 49.1% was recovered, 42.5% was neutralized by landfilling, 4.4% was disposed of in a manner other than landfilling.
2. Extended producer responsibility - Extended producer responsibility (EPR) is an approach that obliges the producer to collect and manage waste generated from the same products that he places on the market. EPR implements the "polluter pays" principle, while being an incentive for the manufacturer to take into account the entire life cycle of the raw material from which his product is made. Therefore, already in the design and production phase, it should use raw materials and technologies and introduce such design and functional solutions that will allow for collecting more waste and recycling as much of it as possible. The analysis of the currently operating EPR systems leads to the conclusion that there are a number of problems that both producers and recyclers face. Taking into account that the first element of the waste management hierarchy is the prevention of waste generation, it is reasonable to extend the definition of EPR beyond what results from the current regulations. The producer should not only be obliged to collect and manage the waste, but also to design and manufacture a product in such a way as to measurably contribute to the extension of its useful life.



3. In the near future, there will be an opportunity to analyze the effectiveness of the current system and to introduce changes or completely new solutions in this regard, in connection with the amendment of European directives on waste. In particular, the new requirements provide for increasing the levels of recycling of municipal waste to 55% in 2025, 60% in 2030 and 65% in 2035. The high targets also apply to the packaging itself, where the level of 65 should be reached in 2025. % recycling, and in 2030 70%. Therefore, it is necessary to introduce modifications to the waste regulations currently in force in Poland. In particular, it is about a clearer definition of the roles and responsibilities of individual entities involved in the implementation of the EPR, imposing obligations on entities other than producers, setting new goals for preparing for re-use and recycling of individual waste streams, developing a reporting system for EPR implementation, or ensuring the same treatment by the system for all entrepreneurs.

4. LCA – Life Cycle Assessment

The product LCA includes the identification and quantification of the so-called "inputs" (raw materials, energy, water, etc.) and "outputs" (product, waste, emissions, etc.) to and from the product system and the determination of the environmental impact of these "inputs" and "Exit" in designated categories (for example, depletion of water resources, soil salinity, land use and conversion, global warming, ozone depletion, acidification, eutrophication, ecotoxicity, ionizing radiation, smog, etc.). The product system consists of individual stages of the life cycle, i.e. the extraction of raw materials, their processing and production of goods, product transport and distribution processes, product use and waste management phases. The aim of the European Commission is to create a competitive economy in which environmental resources are used efficiently and sustainably. One of the activities in this area is the pilot phase for the development of uniform methodologies for the calculation of the environmental footprint for individual product groups and economic activities, which are based on the LCA concept. Although regulations regarding the impact of individual product categories and economic activities on the environment do not yet exist, it is necessary to start now the preparatory process for their implementation in the future.

3.2. Sustainable consumption.

The habits and consumption patterns of the inhabitants of economically developed countries are hardly sustainable. The experience of Western European countries shows that the level of consumption rises sharply with the growing wealth of the society. This trend is also noticeable in Poland. As the European Commission emphasizes in the communication Closing the loop - an EU action plan for the circular economy, choices made by consumers may support or hinder the development of circular economy. The behavior of consumers is therefore essential for the successful transformation towards circular economy.

Sustainable consumption is about meeting basic human needs while minimizing the consumption of natural resources and reducing waste and emissions.



1. Municipal waste.

Municipal waste management in Poland is still a challenge. Creating an economy that fully implements the circular economy approach will require the intensification of activities in the field of preventing the formation and management of as much municipal waste as possible through recycling. The latter, in turn, requires that the waste be collected selectively and of good quality. The quality of municipal waste depends in particular on its cleanliness, understood as non-contamination with other types of waste. The levels of municipal waste recycling deviating from the highest European levels are a problem in Poland, both from an environmental and economic point of view. The latter is related to the insufficient supply of secondary raw materials for the domestic economy.

Therefore, the analysis is required to assess and propose changes to the operating system. A several dozen percent reduction in the level of waste landfilling could be one of the driving forces behind the development of the Polish economy, especially from the point of view of reducing the demand for primary raw materials in favor of greater use of secondary raw materials.

The need for better municipal waste management is also related to the requirements of European law. The 2018 revision of the Packaging and Packaging Waste Directive provides for a significant increase in the recycling rates of packaging waste (which accounts for a significant share of municipal waste), including up to 50% for plastic waste in 2025, 70% for glass and 75 % for paper and in 2030 up to 55% for plastic waste, 75% for glass and 85% for paper. At the same time, the possibility of landfilling municipal waste will be significantly reduced - to 10% in 2035.

2. Food waste

According to international estimates, over 9 million tonnes of food are wasted annually in Poland.² Food is wasted at the stage of production, distribution and consumption. During production, nearly 6.6 million tonnes of food waste is generated, in households - over 2 million tonnes, and in other sources - 0.35 million tonnes. Taking into account the European trend, it is worth paying special attention to consumers now. Food losses at the stage of consumption most often result from difficulties in determining the demand, incorrect planning of purchases and meals, and improper storage. Selective collection of food waste and its management in appropriate installations is an important element of waste management, especially taking into account the fact that in Poland, 39% of respondents admit to throwing away food. On the other hand, the most frequently mentioned cause of food waste is exceeding the use by date.



3. Education

Environmental education is crucial for the successful transformation towards circular economy. However, research on sustainable consumption shows that the level of consumer knowledge of Poles is still low. The belief about the real impact of consumers on the environment in which they live, and as a result on the quality of life of the present and future generations, is also weak. In this context, it is important to focus education on changing consumer behavior by raising their awareness of environmental protection and developing their knowledge of the rights regarding access to information about the product and the producer.

In the age of "lifelong learning", educational activities should be diverse and targeted at all social and age groups. Raising awareness of future consumers should start at the stage of primary and general education. It is important that the knowledge in this field is practical and reflects the trends emerging on the market. Moreover, it is necessary to disseminate practical knowledge in the field of sustainable consumption also among adults as part of social campaigns. Changing the mindset and habits of consumers will ultimately contribute to putting pressure on producers.

3.3. Bioeconomy

The circular bioeconomy, i.e. the biological cycle in the economy, is, apart from the technological cycle, one of the two pillars of circular economy. The biological cycle in circular economy is related to the management of renewable resources - i.e. the so-called biomass - throughout the life cycle, i.e. it includes their processing, production of goods (e.g. food, feed, bioenergy), sale of goods, the use phase and bio-waste management. Bioeconomy is the basis for the functioning of the first sector of the economy, which includes agriculture, forestry and fishery, as well as many branches of the second sector, including the food, feed, forest and wood, pulp and paper, pharmaceutical, textile, furniture, construction and biotechnology industries, cosmetic, fuel or organic recycling. Bioeconomy assumes the management of renewable resources in an optimal, responsible and sustainable manner. This means that these resources should be used in the most economically and environmentally beneficial way, taking into account the principle that the most important product is food. In addition, they should be managed in such a way as to ensure that resources, including soil, surface water and air are fully regenerable. Currently, apart from food production, biomass is most often used in Poland for energy purposes, mainly for direct combustion and to a relatively small extent for the production of liquid fuels. Combustion of otherwise usable biomass does not fit in with the idea of circular economy, according to which it is crucial that the biomass is kept in the economic cycle as long as possible and its value is maximized. When implementing circular economy in Poland and Wielkopolska, one should focus on general activities aimed at creating conditions for the development of bioeconomy in Poland, and on the other hand on activities related to the development of bioeconomy in selected areas, i.e. creating local value chains, in industry and in energy.



1. Key activities in the area of creating conditions for the development of the bioeconomy.

Creating conditions favorable to the management of biomass requires a coherent approach not only at the central level, but also at the regional level. This is because biomass is local. It is the types of biomass available in the region that should determine the directions of its development.

2. Activities in the area of building local value chains and resource base

The production of innovative materials and products within the bioeconomy requires ensuring the continuity of supplies of appropriate quality biomass. Thus, it is important to build local value chains in areas concentrated around local biorefineries, which will be able to produce high-quality bio-raw materials in amounts in line with the expectations of entrepreneurs. Activities in the area of securing the resource base, which depend, inter alia, on soil resources, are also of key importance. In this context, it is important to ensure the high availability and quality of soils (for example by rational use of mineral and organic fertilizers, plant protection products, etc.).

3. Activities in the field of energy

Biomass is currently one of the most popular renewable energy sources in Poland. Rational management of biomass should, however, be a cascade method, consisting in its use in the first place for food production and as a raw material for the chemical, pharmaceutical, paper and building materials industries, and for the production of organic fertilizers. Increasing the level of biomass management will contribute to an increase in employment in agricultural areas. It will also enable the achievement of the objectives of Directive 2009/28 / EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources, amending and subsequently repealing Directives 2001/77 / EC and 2003/30 / EC (Journal 2009 EU L 140/16).

4. Activities in the area of industry

The use of biomass in industry is inextricably linked with biotechnology, listed by the European Commission as one of the key technologies for the further economic development of Europe.

Biotechnology is an interdisciplinary field of science and technology dealing with the change of living and inanimate matter through the use of living organisms, their parts or their products, as well as models biological processes to create knowledge, goods and services. As part of supporting the development of the bioeconomy in the industrial sector, the principle of the cascading use of biomass resources is important, favoring the use of technologies that generate higher added value, which allow the reuse and recycling of products and raw materials, and promote the use of biomass for energy purposes only when others are exhausted. the possibility of its development. Priorities are the use of materials before energy, motivated by the irreversible loss of raw materials during combustion, and the production of energy in combination with 'co-products' such as compost, rather than just energy production.



3.4. New Business Models

The transformation towards circular economy requires the reorganization of the functioning model of practically all market participants, including entrepreneurs, public institutions and consumers. Traditionally, a business model relates to an enterprise and is defined as the sum of resources and activities that the enterprise organizes and carries out in order to deliver specific value to the customer. According to CE, the company's business model consists of the following elements: key partners / suppliers, key activities, key resources, customer relationships, distribution channels, customer segmentation, costs and revenues. The circular economy scenario mostly relates to business models of enterprises, understood as the sum of resources and activities that simultaneously serve to provide value for the customer and "closing the loop".

Cooperation, not only between consumers and producers, but also among producers among themselves and between entrepreneurs, scientists and the public sector, is a new element of business models, which is crucial for the success of the transformation towards circular economy. The source of new solutions in the field of business models may be the involvement of social and solidarity economy entities, for example social cooperatives, associations, foundations. Thanks to their roots in local communities, these entities provide services (for example in the field of municipal waste management, sharing goods, creating food cooperatives) tailored to the needs of these communities, at the same time contributing to raising their awareness, as well as social and professional reintegration of people at risk of exclusion social and to create new jobs on the local market. In line with the concept of sustainable development, they thus contribute to the simultaneous achievement of economic, environmental and social goals.

4. Critical issues

Please verify in your area what type of weakness or threats hint the SRM market (economical, legal, technical, others?). Consider the output of DT.1.2.3. Joint report about environmental analysis constraint in SRM treatment.

Strengthening the circular economy both in Poland and in the Wielkopolska region involves many obstacles and critical aspects. To develop a circular economy, the following aspects need to be considered:

- Legal status: legislative initiatives that follow EU regulations are needed
- How other by-products can obtain product status (from by-product to secondary raw material)
- Creation of mechanisms integrating the entire supply chain - work is currently underway on extended producer responsibility (EPR), which Poland, as the last country in the EU, has not yet implemented
- Primary raw materials for industry are often cheaper than recycled materials. Recycling is a process that requires a lot of manual work



- Creating a mandatory limit for the use of recyclates in industrial production. This is a very important aspect that can significantly affect the development of the use of recyclates for reuse
- Need a good example from above. Green public procurement and prioritizing sustainable products made from recycled materials
- Information and advisory campaigns aimed at the public to increase the demand for recycled products
- Innovative product design - innovation and eco design as the key to effective implementation of sustainable solutions

5. Stakeholders involvement

In the implementation of RAP, the stakeholders engagement is needed. What kind of indication comes from the stakeholders?

During the CIRCE2020 project, the intensive discussions with different stakeholder groups were performed. When looking for data that helps with Action Plan, several forums, meetings and workshops were organised to gain an insight how the different stakeholders perceived circular economy.

Regular bilateral meetings, forums, events and trainings were organized within the framework of the CIRCE2020 project involving the following stakeholder groups to identify the most essential and real-life issues and the possible solutions to spread circular economy business models:

- relevant ministries, policy makers, authorities, municipalities;
- associations and experts dealing with circular economy, environmental protection, R&D&I, green public procurement, sustainable development and waste management;
- producing/manufacturing companies (mostly SMEs);
- waste management and treatment companies;
- communication experts.

6. Indicators

Monitoring the progress of the circular economy is a difficult task. The transition to a circular economy is not limited to specific materials or sectors. It is a systemic change that affects the entire economy and affects all products and services. There is no single widely recognized "circular indicator", and there is also a lack of ready-made, robust indicators describing the most important trends. The circular economy is a cross-sectoral concept, so it is necessary to cover a wider spectrum of thematic categories, including economic growth, materials management, waste, people's quality of life. Monitoring indicators should take into account aspects such as economic, environmental and social. When developing a set of circular indicators, it is important to take account of the existing national and international framework (primarily at the European



Union level). It is important that the regional framework fits well with national ambitions, while at the same time preserving the regional specificity.

Existing framework and indicators of cyclicity

The interest in circularity indicators has increased significantly since the development of the circular economy package by the European Union. Both at the level of international organizations and individual countries, many publications and studies have been created on the selection of indicators and the availability of appropriate data allowing for their monitoring.

In the case of publications at the international level, the basic approaches to monitoring circularity present a division into areas within which the selection of measures is made. In the case of the European Union, such areas are:

- EU self-sufficiency in raw materials
- Green public procurement
- Generation of waste
- Food waste
- Total recycling rate
- Recycling rates for individual waste streams
- The impact of recycled materials on the demand for raw materials
- Trade in raw materials that can be recycled
- Private sector investment, jobs and gross value added
- Patents.

While the breakdown is highly detailed, the OECD takes a different approach focusing on four main areas:

- Productivity of using raw materials
- Regulations supporting circular transformation
- Use of the natural resource base
- The impact of actions in line with circular concepts on the quality of people's lives.

Framework for monitoring circularity in Poland

In the case of Poland, the framework for monitoring circularity has not yet been developed.

Starting from the basics of the circular economy concept, a set of circularity indicators at the regional level can be created.

The main indicators result directly from circular concepts and focus on the retention of economic value in the economy, the consequence of which is the reduction of waste, and the optimization of the amount of new production and consumption.



The purpose of indicators is to fulfill the basic criteria defined for the indicators in this analysis. While the main measures are holistic and replicable, their measurability may be temporarily limited by low communication, and the level of applicability does not ensure appropriate policy for them. Among the indicators, a very important place is taken by indicators of the condition of the natural environment, which directly depend on anthropogenic impacts, and thus also on the current economic model.

Using the main indicators, the attempt should be made to approximate them with the help of classic indicators, used so far mainly in assessing the sustainability of the economy. These are primarily material flows, non-renewable energy consumption, the amount of waste, and meters closing the loop before its total loss of value.

Some of the linkages between indicators and the circular economy are indirect, but carry important information about the circularity of the economy. It is all about looking at the intangible resources that the economy uses, the consequences of using the linear model and involving stakeholders in implementing the circular economy model.

Possible indicators that could describe the cyclicity are:

- Consumption of primary materials
- Consumption of non-renewable energy
- Drinking water consumption
- The use of recycled materials in production processes
- Change in the price of secondary raw materials
- Plastic recyclates used in new products
- Plastic waste generated
- Total weight of waste
- Number of innovative projects supported by LCA analysis
- The percentage of full-time jobs in industries related to circular concepts in relation to total employment
- Total value of circular public procurement in public procurement

7. Topics / Action

7.1. CE and the action plan 2021-2027

The development of CE in the Wielkopolska region should be consistent with the EU policy and strengthen it at the regional level. Particular attention should be paid to the Green Deal action plan to make EU's economy sustainable.

The European Green Deal provides an action plan to

- boost the efficient use of resources by moving to a clean, circular economy
- restore biodiversity and cut pollution



The plan outlines investments needed and financing tools available. It explains how to ensure a just and inclusive transition.

The EU aims to be climate neutral in 2050.

Reaching this target will require action by all sectors of our economy, including

- investing in environmentally-friendly technologies - prioritise reducing and reusing materials before recycling them. Minimum requirements will be set to prevent environmentally harmful.
- products from being placed on the EU market. False green claims will be tackled.
- supporting industry to innovate - to reduce EU greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. This level of ambition for the next decade will put the EU on a balanced pathway to reaching climate neutrality by 2050.
- rolling out cleaner, cheaper and healthier forms of private and public transport
- decarbonising the energy sector - The European Commission will make proposals to increase the EU's climate ambition for 2030. Relevant energy legislation will be reviewed and where necessary revised by June 2021. EU Member States will then update their national energy and climate plans in 2023, to reflect the new climate ambition.
- The ensuring buildings are more energy efficient - Better energy performance of buildings, prices of different energy sources should incentivise energy-efficient buildings, design of buildings should be in line with the circular economy, increased digitalisation, more climate proofing of buildings, strict enforcement of rules on energy performance of buildings
- working with international partners to improve global environmental standards

7.2. Green Public Procurement

Green Public Procurement (GPP) is a process by which public authorities seek to obtain goods, services and works that have a lower environmental impact throughout their life cycle compared to goods, services and works. with the same purpose as would have been ordered otherwise.

Green Public Procurement can save public authorities money - especially when considering the lifecycle costs of procured products or services, not just in terms of the purchase price. For example, purchasing products that use low energy or water can help you reduce your utility bills significantly. Reducing the amount of hazardous substances in purchased products can reduce the costs of their disposal. Bodies implementing GPP will be better equipped to meet evolving environmental challenges as well as to meet political and binding targets for reducing CO2 emissions and increasing energy efficiency and in other areas of environmental policy.

Potential areas of activity:

- Reducing the negative impact of enterprises on the environment, including improvement of air quality through support for investment projects.
- Reducing the consumption of primary raw materials



- Reducing water consumption per unit of final production - not less than 5%
- Reducing or avoiding harmful emissions to the atmosphere
- Reducing or avoiding harmful emissions to the atmosphere for fuel combustion sources with a capacity of 1 MW –50 MW
- Limiting or avoiding harmful emissions to the atmosphere for combustion plants with a capacity above 50 MW
- Limiting or avoiding harmful emissions to the atmosphere from industrial activities (excluding fuel combustion sources)
- Share of electric vehicles in the fleet. Supreme and central state administration bodies shall ensure that the share of electric vehicles in the fleet of vehicles in service in the office or budgetary economy institution or other entity providing services in the field of passenger transport is at least 50% of the number of vehicles used.
- Life cycle cost as criteria taking into account. The cost criteria can be determined using life cycle costing. Life cycle costing may be include in particular costs:
 - 1) incurred by the contracting authority or other users related to: a) acquisition, b) use, in particular consumption of energy and other resources, c) maintenance, d) decommissioning, in particular costs collection and recycling;
 - 2) attributed to environmental externalities related to the life cycle of a product, service or works related to the emission of greenhouse gases and other pollutants, and others related to climate change mitigation, as long as their monetary value can be determined and verified.

7.3. By-Product

Nowadays, the definition of waste is based on the utilization rather than the value of the material. The starting point for the circular economy is that materials are only in waste temporarily and then reintroduced into the economy as a product.

In 2008, the update of the EU's Waste Framework Directive (WFD) introduced end-of-waste (EoW) criteria for the first time. According to the criteria, product status can be achieved if:

- the substance or object is to be used for specific purposes;
- there is a market or demand for the substance or object;
- the use is lawful (the substance or object meets the technical requirements for the specified purpose and complies with applicable product legislation and standards);
- use will not lead to overall adverse environmental or human health effects.

However, after 10 years, end-of-waste criteria have only been set for three different types of waste: ferrous scrap, copper scrap and glass cullet.

As a result, responsibility for the further implementation of end-of-waste is left to the Member States, but there are many different practices and approaches to this.



In Poland, applications for by-products status are examined by the regional authorities. There are no uniform rules at national level. It is clear that a distinction between waste and by-product would facilitate the use of secondary raw materials and it would be useful to provide clear criteria for the assessment of by-product and waste status (such as waste / by-products such as fuel or soil substitute) for some major material flows.

7.4. Reuse and Recycle - multilayers, waste management

Composite or multi-layer materials are increasingly used in different applications. Products and materials are getting more and more complex, which affects the ability to retain the value of materials in successive uses. While the combination of different materials may provide unique and desirable properties to products, it also brings challenges for the sorting, separation, recycling or composting of the materials that constitute the products, whether in a compound form or separately. It also complicates their re-introduction into manufacturing processes. A better understanding of these challenges should inform the design of composites and multi-layer materials.

The incoming years strategy should develop new or improve existing innovative processes for the sorting, disassembly/separation, recycling and/or the introduction into manufacturing process of materials from products made of composite and/or multi-layer materials and assess the potential barriers for their implementation. They can deal with used products, production rejects or existing stocks such as material recovered from industrial and municipal landfills. Strategy should aim to optimise value retention in the economy, rather than downgrading the composite or multi-layer materials for applications with low quality requirements, as compared to the value of the initial separate materials, especially for applications with high performance requirements. Activity should also provide recommendations for the design of these applications, products or related materials, based on the lessons learned in the development of these processes, to enable an increase in volume and quality of reuse and recycling of these products. These recommendations cover requirements for product information to enable effective identification and management after use (including consumer targeted labelling, where appropriate). The environmental impact (e.g. substitution of virgin plastics, water saving, impact on water quality), social impact (e.g. related to health and safety legislation) and cost of the innovative processes implemented (e.g. recycling processes) should be assessed in a holistic way, taking the entire lifecycle into account.

This topic is in support of the European Strategy for Plastics in a Circular Economy. Selected projects under this topic as well as projects selected under other topics in Regional Action Plan supporting the Plastics Strategy are strongly encouraged to participate in joint activities as appropriate. These joint activities could take the form of clustering of projects, participation in workshops, common exploitation and dissemination etc.



7.5. Wielkopolska Hydrogen Platform

Hydrogen Wielkopolska Region - Climate change and the strategic commitments made by the European Union and Poland require decisive measures to prevent possible adverse economic phenomena, the impact of which on the pace of the region's development may slow it down. Since 2019, a project of cooperation to develop hydrogen economy in Wielkopolska has been developed.

The main task is to create a multi-level platform for inter-environmental cooperation between business, science, local governments and non-governmental organizations under the name of the Wielkopolska Hydrogen Platform. It is assumed to facilitate the effective connection and use of the potential of the entities associated within it for a low and zero-emission economy.

Platform develops to popularize and implement hydrogen technology in the region and organize a number of events, including conferences and meetings devoted to hydrogen.

The Hydrogen Platform correspond directly to the development of a new Intelligent Specialization dealing with energy issues in the context of the "European long-term strategic vision of a prospering, modern, competitive and climate neutral economy. A Clean Planet for All". The CIRCE2020 project can indirectly support the Wielkopolska Hydrogen Platform initiative. The results of the "check-up quality standard" in one of the pilot action indicated as an alternative development direction the possibility of processing waste from mixed plastics towards obtaining hydrogen. It is worth looking for any industrial symbiosis and taking into account all possible directions of development.