



**Regional Development  
Fund of  
Central Macedonia**



**European Union  
European Regional  
Development Fund**

# **ACTION PLAN TOWARDS BIO-BASED CIRCULAR ECONOMY**

**Region of Central Macedonia Greece**

**Regional Development Fund of Central Macedonia –  
on behalf of Region of Central Macedonia**

**30.08.2019**

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## 1. General information

Project: **BIOREGIO - Regional circular economy models and best available technologies for biological streams 2017-2021**

Partner Organization: **Regional Development Fund of Central Macedonia – on behalf of Region of Central Macedonia**

Other partners: **Laboratory of Heat Transfer and Environmental Engineering – Aristotle University of Thessaloniki**

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## 2. Policy context

The Action Plan aims to impact:

**Investment for Growth and Jobs programme**

European Territorial Cooperation programme

Other regional development policy instrument

**Name of the policy instrument(s) addressed:** Regional Operational Programme of Central Macedonia 2014-2020

The European Union has recently introduced the “circular economy” (CE) as a high-level strategy to move our societies beyond the limits to growth. Circular economy strategy has risen as an alternative to linear systems, since it can reduce material and human footprint by introducing systemic solutions, considering societal needs, environmental limits and generating economic opportunities. According to the European Commission (2015)



circular economy is a new high-level strategy that has been introduced in order to protect businesses against scarcity of resources and volatile prices as well as help them to create new business innovative opportunities and assist them to figure out efficient ways of producing and consuming. That strategy focuses mostly at EU enterprises and plays a crucial role in this process.

Following this trend, within BIOREGIO project, the present work identifies key conditions to draw an ideal scenario for circular bio-economy to thrive. The BIOREGIO project is currently advocating for a respective shift in the focus in the terms of circular bio-economy of the Regional Operational Programme of Central Macedonia 2014-2020. The endeavor is concentrated on encouraging and streamlining interventions that promote the transition to a business model that is built around the CE principles.

## 2.1 National framework related to Circular Economy

In Greece there are two main Policy tools that refer to circular economy: The Revised National Plan for Waste Management and the National Strategy for Circular Economy.

The key priority targets of the Revised National Plan for Waste Management is the re-allocation of waste management to a municipal level, placing the responsibility for separation at source and recycling on the municipalities through small-scale units, the encouragement of community participation, the targeting of advanced waste management techniques and, as an overarching principle, maintaining the public nature of waste management. Moreover, the New NWMP replaces the previous NWMP for non-hazardous waste which came into force in 2003 and – among others – adopted the provisions of EU Directive 91/156/EEC5. According to the New NWMP which is supplementary to the National Waste Prevention Strategic Plan, the national policy on waste management is oriented to the following targets for 2020 “The maximisation of the separation at source and recovery of materials instead of the treatment of MSW in mixed form has been placed at the core of waste management planning.

According to the the National Strategy for Circular Economy, Greek economy presents many opportunities and resources to easily adapt to the circular economy principles. The available knowledge and specialization of the young Greek scientists and the changes that the country undergoes especially in the field of waste management are considered as the most relevant. Furthermore, the Strategy identifies indicative areas of circular economy where parallel actions of regulation and specification are required. These entail the completion of the regional waste management plans, the commencement of construction of mixed waste and of pure streams (e.g. organic) processing projects and the utilization of compost in agricultural production. The implementation of actions in the abovementioned areas can unlock the development of new entrepreneurship, financing of environmental industry, organisation of industrial areas, etc.

The National Strategy was adopted in December 2018. The main long-term goals (2030) for the country are:

1. Integrating eco-design criteria and product lifecycle analysis, avoiding the introduction of hazardous substances into production and facilitating reparability and extending life span. The use of non-hazardous substances also improves the quality of waste during the production process, reducing the impact on the environment.
2. Effective implementation of waste management hierarchy, promoting the prevention and encouraging reuse and recycling.
3. Creation and promotion of energy efficiency improvement guidelines in production processes.
4. Promotion of innovative forms of consumption, such as the use of services rather than the purchase of products or the use of computers and digital platforms

5. Promotion of a rational consumption model, based on the transparency of information about the characteristics of goods and services, their lifespan and their energy efficiency.
6. Facilitating and creating appropriate channels for information exchange and coordination between administrations, the scientific community and economic and social actors, in order to create synergies compatible with the transition to the CE model.
7. Highlighting the importance of transition from linear to circular economy, promoting transparency in processes, developing information for citizens, training and raising awareness of society.
8. Elaboration of transparent and feasible monitoring indicators for the implementation of the transition.

## 2.2 Regional framework related to Circular Economy

At Regional level, the Region of Central Macedonia has created an action plan for CE which is composed of 3 main pillars:

- Integration of CE actions at the ROP 2014-2020. At the moment the Region of Central Macedonia (RCM) proposed the introduction of measures and activities at the ROP CM 2014-2020, through which SMEs will be financed for investments for the transition to CE. Specifically, the promotion of CE is proposed to be implemented in three dimensions: (1) Introduction of the waste management as a main priority, and the reuse of waste as an energy form, as the main parts of circular bio-economy sectors. Those will be used as criteria in the evaluation procedures of the ROP 2014-2020 to calls that concern funding of SMEs; (2) Creation of a structure to promote the idea and good practices on CE; (3) Innovation vouchers for SMEs for funding actions based on waste management and reuse of waste as an energy form.
- Integration of "CE" at the ROP RCM in the next programming period (2021-2027). CE will be explicitly reflected at the Region of Central Macedonia financial priority axes.
- Targeted strategic actions of RIS3 at RCM to enforce CE. Based on the aforementioned information the main policy changes that are expected in the introduction of the waste management as a main priority, and the reuse of waste as an energy form.

Furthermore, the RCM is implementing the revised Regional Waste Management Plan. It is a comprehensive management plan for waste produced in the region, which identifies the general guidelines for their management, in line with the guidelines of the National Waste Management Plan and the National Plan for the prevention of waste generation. It indicates appropriate measures for the combined promotion, in hierarchical order, of prevention, reuse, recycling, other types of recovery, such as energy recovery, safe final disposal at regional level. For the biological streams the main targets per waste category are:

### Biowaste

- Diversion through household composting with a minimum target of at least 3% by weight of biowaste by 2020, in accordance with the target of the National Plan.
- Maximizing levels of diversion of "available for collection" waste of edible fats and oils, aiming at 75% by 2020.
- Diversion through a network of separate collection of municipal biowaste (including food residues and green wastes).

### Urban type sludge:



- Recovery as a soil improvement material for the benefit of agriculture or in applications of landscape regeneration as a priority (focus in energy crops).
- Use of secondary fuel in the cement industry or in thermal power stations.
- Disposal in landfills only in exceptional cases

#### Animal by-Products:

- Disposed of directly as waste by incineration in an approved plant.
- Use as raw material in petfood plants.
- Processing according to a specific method in an approved processing plant for technical products, biogas or composting.
- Category 3 food residues, composted or transformed into a biogas plant.
- Materials derived from fish, ensiled or composted.

#### Organic agricultural waste and residues:

- Seeking full recovery of agri-food waste, prioritising its recovery in agriculture and strengthening cooperation with the recycling industry of biodegradable waste.
- Making optimum use of the energy content of agri-food waste.
- Promotion of biological methods in agricultural production, in order to increase the use of soil-improving material produced by agricultural waste.
- Ensuring the environmentally sound management of agricultural and livestock production waste (greenhouses plastics, packaging of fertilizers and veterinary medicines, etc.).
- Informing and sensitizing producers of agricultural and livestock products, on the benefits (economic and other) that the lawful management of such waste may bring.

### 2.3 Description of the policy Instrument

The ROP of CM 2014-2020 was adopted on 18/12/2014 by the EC and revised at 6/12/2017 and is an important programmatic and financial tool for supporting the regional development policy in the programming period 2014-2020.

The development vision of the Region for the new programming period 2014-2020 is: "The promotion of Central Macedonia as a dynamic development area of international reach with distinct identity, competitive and innovative production base, quality environment, strong social and territorial cohesion".

The ROP of CM 2014-2020 follows and serves the general objectives of the overall regional development strategy, focusing on:

- Transitioning the regional economy into a new and sustainable production model with competitiveness, extroversion, innovative entrepreneurship and smart and friendly use of Information and Communication Technologies (ICT).
- Protection and sustainable management of the natural and man-made environment and natural resources to ensure the quality of life and resource efficiency.

- Integration - promotion of the transport infrastructures and networks for the promotion of the Region in an international transport hub - utilization of its central position in the macroregions of Southeast Europe and the Eastern Mediterranean.
- Supporting and strengthening the mobility and upgrading of human resources, addressing unemployment dynamically and ensuring social cohesion.

It includes 9 Priority Axes with resources totaling EUR 1,009 million in terms of public expenditure and aims to address the needs and problems and to exploit the potential and benefits of the Region. It is co-financed by the European Regional Development Fund (ERDF) and the European Social Fund (ESF).

Under Priority Axis (PA) 01: "strengthening research, technological development and innovation" includes actions to strengthen research, technological development and Innovation and focuses on two investment priorities. BIOREGIO project is related with the Investment Priority (IP) 1b "Promotion of business investment in the Research and innovation, development of links and synergies between enterprises, research and development centres and the higher education sector, in particular through the promotion of investments in the development of products and services, the transfer of technology, the Innovation, eco-innovation,...".

The objectives of the ROP in relation to IP.1b are as follows:

1. 1b1. Promotion of investment in the development of products and services in the priority areas of the Regional Smart Specialization Strategy (RIS3)
2. 1b2. Creation of permanent cooperative mechanisms between research units and enterprises, as well as between enterprises to promote applied research (RIS3 areas) and transfer of knowledge and technology.

The indicative actions for funding from the ROP in the above IPs include:

#### Objective 1b1:

1. Enhancing the supply of knowledge to cover identified necessary interventions in parts of the value chain of RIS3 priority industries through R&D actions undertaken by research groups of the academic or research sector.
2. Implementation by the academic or research community of small demonstration projects aiming at the diffusion of mature research results, in particular by applying KETs, in the productive base.
3. Strengthening of individual enterprises of appropriate size for investment in applied research aimed at product, or process, technologically driven innovation.
4. Reinforcement of investments for RTDI of clusters or partnerships between companies, academic or research centres and/or international partners for applied research to solve problems of common interest or to jointly develop new products. The action may include pilot projects.
5. Support for companies in their initial phase (seed or startup phase) that have an innovative product or service to introduce them to the market.
6. Making innovation vouchers available to micro and small businesses to stimulate their innovative activity and provide incentives for experimentation

#### Objective 1b2

1. Strengthening of permanent cooperative mechanisms to create a framework for stakeholders, led by industry, in order to set priorities in the field of RTDI, timeframes and action plans in strategic areas of importance (RIS3)



2. Creation of a joint mediation structure (one-stop liaison office) between the academic and research institutes of the RCM.

**In total, the resources of the Priority Axis 1 amount to 21,558,441, while the resources for the investment priority 1b amount to €9,839,691, representing 1% of the policy tool.**

The quantified objectives set for the development of business investment in research and innovation, growth of links and synergies between enterprises, research and development centres and the higher education sector in the ROP RCM are as follows:

Indicator	Type	Unit	Base value (2011)	Target value (2023)
Productive investments: Number of undertakings receiving support	Output	enterprises		280
Productive investments: Number of undertakings receiving grants	Output	enterprises		80
Productive investments: Number of undertakings receiving non-financial support	Output	enterprises		200
<b>Research, Innovation: number of undertakings cooperating with research institutes</b>	<b>Output</b>	enterprises		<b>400</b>
Research, Innovation: Number of undertakings receiving aid to introduce new products on the market	Output	enterprises		20
Research, Innovation: Number of undertakings receiving aid to introduce new products to the company	Output	enterprises		40
R&D expenditure of the private sector (in relation to the Regional GDP)	<b>Result</b>	%	0,16	0,30

**The action plan of the BIOREGIO project for the Region of Central Macedonia aims to influence the indicator "number of companies cooperating with research institutes" of Priority Axis 1 of the policy tool "Regional Operational Programme of Central Macedonia 2014-2020".**

### 3. Good practices identified

Among the BIOREGIO project activities is the collection and evaluation of different good practices per participating country in order to disseminate them actively to the rest of the European Union regions and facilitate their replication, all of them are reported through the learning platform enabled by the Interreg Europe programme (<https://www.interregeurope.eu/policylearning/>). Each BIOREGIO good practice has a significant impact in local bioeconomy and fulfils the following criteria:



1. Promotes circular bio-economy.
2. Is related to biological materials, in other words, products are composed of substances originally derived from existing compounds in nature.
3. Promotes social and environmental sustainability, as well as economic growth
4. It is resource efficient and economically feasible.
5. Minimizes waste directly or indirectly according to waste hierarchy whose objective is to maximize the benefits of the products, whereas the generation of waste is reduced.
6. Encourages closing the loops and emphasizing longer cycles/cascades.
7. Includes joint actions (discussions/cooperation/business) between different stakeholders: RDI, government, companies and consumers.
8. It is most likely transferable and scalable in different European regions in line with the objectives of the Interreg Europe programme.

In the region of Central Macedonia, the most relevant good practices, that are published at the project website, are:

No	Name	Short Description	Link to webpage for more information
1	American Farm School (AFS)	American Farm School is a boundary organization training people of all ages, from kindergarten to post-grads and adult training applying circular economy	<a href="https://www.interregeurope.eu/policylearning/good-practices/item/1416/american-farm-school-afs/">https://www.interregeurope.eu/policylearning/good-practices/item/1416/american-farm-school-afs/</a>
2	Bio2CHP- Use of organic residues for energy production	A decentralized, easy to set-up, bio-based power generator, which converts organic residues into electric power and heat.	<a href="https://www.interregeurope.eu/policylearning/good-practices/item/1336/use-of-organic-residues-for-energy-production/">https://www.interregeurope.eu/policylearning/good-practices/item/1336/use-of-organic-residues-for-energy-production/</a>
3	BIOGAS LAGADA - Bioenergy and fertilizers from livestock and agriculture farms	Production of electricity and soil enhancer through anaerobic digestion of agricultural waste	<a href="https://www.interregeurope.eu/policylearning/good-practices/item/1010/bioenergy-and-fertilizers-from-livestock-and-agriculture-farms/">https://www.interregeurope.eu/policylearning/good-practices/item/1010/bioenergy-and-fertilizers-from-livestock-and-agriculture-farms/</a>
4	Smart Specialisation Platforms for Agri-Food for the Region of Central Macedonia	The Region of Central Macedonia's main strategy is the participation and co-creation in a number of S3P Agri-Food platforms.	<a href="https://www.interregeurope.eu/policylearning/good-practices/item/2473/smart-specialisation-platforms-for-agri-food-for-the-region-of-central-macedonia/">https://www.interregeurope.eu/policylearning/good-practices/item/2473/smart-specialisation-platforms-for-agri-food-for-the-region-of-central-macedonia/</a>
5	EVYP S.A. - Amino acids fertiliser deriving from the extraction of	Production of liquid solution of highly concentrated L-amino acids derived from the hydrolysis/extraction of	<a href="https://www.interregeurope.eu/policylearning/good-practices/item/1594/amino-acids-fertiliser-deriving-from-the-extraction-of-proteins-from-non-gmo-plants/">https://www.interregeurope.eu/policylearning/good-practices/item/1594/amino-acids-fertiliser-deriving-from-the-extraction-of-proteins-from-non-gmo-plants/</a>

No	Name	Short Description	Link to webpage for more information
	proteins from non-GMO plants	exclusively plant origin non-GMO raw materials.	
6	Cluster of Bioenergy and Environment of Western Macedonia (CLuBE)	CLuBE is a platform for public sector, research and entrepreneurship cooperation to boost the regional economy.	<a href="https://www.interregeurope.eu/policylearning/good-practices/item/1014/cluster-of-bioenergy-and-environment-of-western-macedonia-clube/">https://www.interregeurope.eu/policylearning/good-practices/item/1014/cluster-of-bioenergy-and-environment-of-western-macedonia-clube/</a>

It is obvious that more than half of the above practices focus on products of cooperative innovation/R&D in the field of biomass energy utilization. Therefore, the content of the Action Plan focuses on the creation of biomass value chain. Moreover, the Action Plan contributes to the implementation of good practices detected elsewhere and to the development of new ones based on the local mentality and capabilities.

#### 4. Details of the actions envisaged

Utilizing the aforementioned context analysis and tools, the Greek partners:

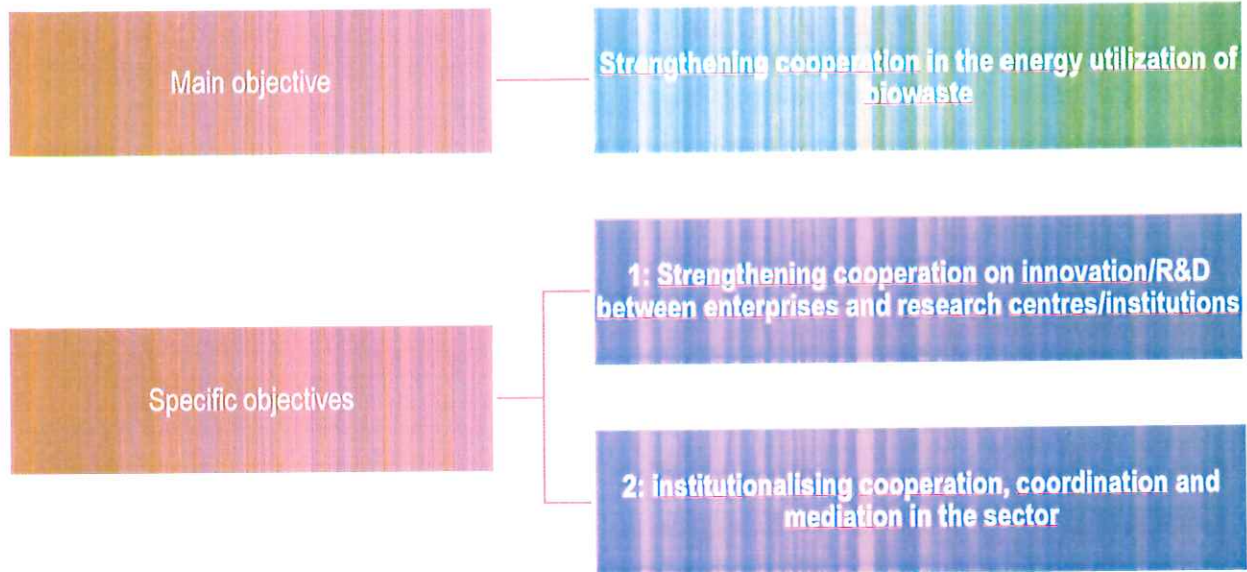
- Laboratory of Heat Transfer and Environmental Engineering, Department of Mechanical Engineering, Aristotle University,
- Regional Development Fund of Central Macedonia on behalf of the Region of Central Macedonia

in association with the Local Support Group (LSG) acknowledged the following possibilities for action in the circular bio-economy in the region of Central Macedonia:

- Increase of investments in biogas plants from agricultural waste for the production of electricity, heat and natural gas substitutes.
- Replacement of traditional fertilizers (from fossil fuels or material extraction) with products resulting from the recovery of nitrogen and phosphorus from biogas plants.
- Reducing food and agricultural waste and increasing the efficiency of the agricultural value chain through the distribution of secondary materials.
- Increase in revenues for farmers due to the increased demand for products and byproducts from agriculture for the production of green products (bio-economy).

Based on the above organization of the conclusions, and taking into account the exchange of experience in the interregional seminars and the good practices presented in the work visits and the project website in Interreg Europe, the parties concerned have defined the objectives of the BIOREGIO Action Plan in the region of Central Macedonia:





#### 4.1 ACTION 1: Pilot projects of cooperative innovation/R&D in the field of biowaste energy utilization

##### 4.1.1 Relevance to the BIOREGIO project

The operational planning for 2019-2021 of the National Strategy for Circular Economy in Greece foresees the funding and incentives for the support of circular economy. Especially, the efficient prioritization of waste management is one of the main long-term objectives (2030) for the country.

To this end, the updated Regional Waste Management Plan for Central Macedonia sets as a target for organic agri-food waste and residues the "*optimum utilization of their energy content*", while for the animal byproducts it aims to "*processing according to a specific method in an approved processing plant for technical products, biogas or composting*".

Moreover, the RIS3 Strategy of the Region, sets out two relevant priorities for the sectors of "Energy Technologies" and "Environment" : for the former the goal is to "enhance the production of renewable energy by exploiting the characteristics of the region and exploiting synergies with other value chains such as biomass", while for the later is a turn towards "biomass production (either for production of compost or for energy utilization) and biofuels".

During the 1<sup>st</sup> phase of the BIOREGIO project 17 biogas plants were recorded being in production mode or at an advanced stage of licensing and implementation in the region. With the full operation of all units it is estimated that the production of RES from biomass/biogas will increase fivefold in the RCM from 8 MWh at 40 MWh.

Thus the sector of energy production from the utilization of biowaste in the region of central Macedonia has significant potential and can be a good example of a business model based on the circular bio-economy. However, the survey conducted for the BIOREGIO project to the biogas plant operators highlighted two main industrial needs: the need to utilize additional biowaste streams, as they currently use only animal by-products and/or livestock farm wastes and the need to cooperate with research organizations for further R&D in the production of biomass energy i.e. from industrial sludge and domestic organic waste.

The Region of Central Macedonia and the local stakeholders draw inspiration and transferred from the BIOREGIO project alternative and/or more advanced ways of utilizing biowaste streams for energy production in combination

with the production of additional products: bio-refineries with steam explosion systems for the valuation of lignocellulosic waste (vine shoots, olive branches, pruning, residual straw, etc.) and fermentable wet biomass (slurry, whey, sludge, meat meal, etc.) (good practice: CLAMBER), biogas and fertilizer from municipal biowaste, biowaste from food industry, sludge from wastewater treatment plants and biodegradable material from farming, forestry, fisheries (good practice: production of biogas and fertilizer from biowaste streams and wastewater sludge), bioethanol fuel from beverage manufacture, bakeries and mills wastes (good practice: Bioethanol from by-products of food industry), bioethanol from maize by fermentation process, biodiesel from rapeseed oil, used cooking oil (UCO) and other oils that are pre-treated and by transesterification process modified to FAME (Fatty Acid Methyl Ester) with side-streams market application (good practice: Production of biofuels from crops and oils).

Moreover, the SECVENT project (procedures for the closure of the loops of lateral flows in the bioeconomy and the innovative (bio) products based on them 2016-2021) implemented by the National Institute of Research and Development in chemistry and petrochemistry of Romania presented a good example utilized by the RCM on how to support innovation and development of new technologies for the valorization of biowaste.

The above good practice was identified in the Policy Report of the BIOREGIO project by the partner South Muntenia Region of Romania and can be accessed at the BIOREGIO website<sup>1</sup>. The factors of the SECVENT project that were evaluated during the Local Stakeholders Group meetings as suitable for adaptation in the Region of Central Macedonia are as follows:

- This action offers very good funding conditions for companies, since they have to pay only 20%- 50% of the cost of the services provided by the research entities (depending on the type of service and size of the enterprise), the rest being supported by ERDF funds and the Romanian state budget. The companies also have the opportunity to receive funding for their own research and innovation activities carried out together with the research entity.
- The project has a total budget of ~3.4 mil Euros, and it is expected that at least 25 enterprises will be supported to develop added value products from biowaste flows that otherwise would be wasted or used only as animal feed, like vinasse, whey, marc, draff etc.
- Possible products that could be obtained from biowaste utilization are food enhancers, cosmetics, food additives, biostimulants, fibres, enzymes, dyes, etc.

#### 4.1.2 Nature of the action

The action will facilitate the transfer of research results to industrial partners operating in the field of biowaste and biological streams and provide the means to connect biological streams to research results and enterprises.

To this end, it was considered necessary to strengthen SMEs for the purchase of innovation advisory and support services of knowledge by innovation bodies for:

1. Development of innovative products, services,
2. Development of innovative processes of production or operation of enterprises
3. Solving problems in the production process in order to improve the quality of the products produced
4. Strengthening cooperation between enterprises and research and technology bodies
5. Promoting R&D activities by innovation bodies oriented towards business needs

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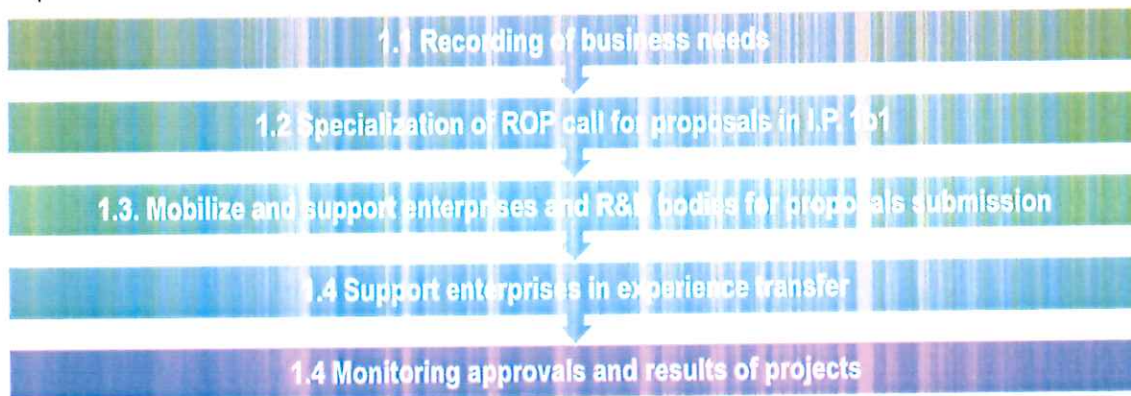
<sup>1</sup> <https://www.interregeurope.eu/bioregio/library/#folder=1289>



in the thematic areas of the circular bio-economy. In essence, the above services will be offered through the transfer of know-how as directly usable solutions to the productive problems and needs identified by businesses.

Therefore, the action supports and influences the ROP 2014-2020 in the direction of adopting the priorities of the National Strategy for Circular Economy. This is achieved by shaping the appropriate content for the Calls for Proposals and in particular the project selection criteria, in order to incorporate interventions that promote the transition to a production model in accordance with the principles of circular bio-economy. At the same time, the action supports the mobilization of enterprises in the fields of bio-economy and the transfer of technologies and solutions from the good practices of the BIOREGIO project that have been reported, to take advantage of the available resources of the ROP in order to solve problems and needs in their production process and operation.

For the implementation of the action in the region of central Macedonia, the following specific activities are required:



#### 4.1.3 Stakeholders involved

The actors involved in the implementation of the action are part of the Local Support Group. In the framework of the meetings of the local group and utilizing the experience of corresponding good practices that emerged in the interregional seminars of the BIOREGIO project, the initial roles of the stakeholders are distributed according to the table below.

Stakeholder	Role
<b>Region of Central Macedonia</b>	It is the owner of the action and given its role as a planning and implementation body of policies it undertakes the coordination of the action.
<b>Managing Authority of the Operational Programme for the Region of Central Macedonia</b>	It is the funding and programming body of the policy tool. Undertakes the specialization of action to strengthen research and development of enterprises for the utilization of biological streams of waste and the introduction of relevant criteria for the evaluation/selection of projects.
<b>Aristotle University of Thessaloniki - Laboratory of Heat Transfer and Environmental Engineering</b>	Support in the recording of the needs of enterprises and highlight technologies, methods for the utilization of biomass types for energy production.

Stakeholder	Role
<b>Enterprises in the biowaste value chain</b>	They are the beneficiaries of the action and the source of identification of the main needs in the sector.

#### 4.1.4 Timeframe

The overall timetable of the action amounts to three (3) years. During the 1<sup>st</sup> year of implementation the activities that will feed the specialization and publication of the call for proposals of the policy tool "Central Macedonia Operational Programme 2014-2020" should be completed due to the deadlines for the actions and eligibility of expenditure of the programme. During the 2<sup>nd</sup> and 3<sup>rd</sup> year, the results of the call will be monitored as regards the implementation of the approved projects and the support of businesses for the exchange of knowledge and experience.

Activities	Semester					
	A2019	B2019	A2020	B2020	A2021	B2021
1.1 Recording of business needs						
1.2 Specialization of ROP call for proposals in I.P. 1b1						
1.3. Mobilize and support enterprises and R&D bodies for proposals submission						
1.4 Support enterprises in experience transfer						
1.5 Monitoring approvals and results of projects						

#### 4.1.5 Costs and funding sources

The total cost for the implementation of the action was estimated at €4 million in the specialization of the ROP of Central Macedonia in action 1b.3 of Investment Priority 1b.

### 4.2 ACTION 2: Creation of a structure for supporting the biowaste value chain

#### 4.2.1 Relevance to the BIOREGIO project

One of the main goals of the National Strategy for Circular Economy in Greece is the facilitation and the creation of communication channels for information exchange and coordination among the administration, scientific community and economic and societal actors. This is in line with the findings of the BIOREGIO study in all the participant countries in national as well local levels. Indeed, the successful circular economy implementation



requires extensive support and cooperation on different levels and between stakeholders<sup>2</sup>.

In this framework, the RCM has recently drafted an action plan for circular economy that includes among other actions the creation of a structure to promote the idea and good practices on circular economy. Specifically, the Region of Central Macedonia (RCM) proposed the introduction of measures and activities at the ROP CM 2014-2020, through which SMEs will be financed for investments for the transition to CE. As it was mentioned above, the promotion of CE is going to be implemented in three dimensions: (1) fund of waste management activities that contribute to circular economy activities by the ROP 2014-2020 from calls that concern funding of SMEs; (2) Creation of a structure to promote the idea and good practices on CE; (3) Innovation vouchers for SMEs for funding actions based on waste management and waste as an energy form. At a public level, the public consultation for the National Strategy for CE has been concluded in June 2018.

At the same time the region of CM participates in the S3 Platform in the field of agro-food (good practice: S3P). By trying to exploit new knowledge in the food industry and in areas of biological basis sectors in general, RCM aims to act as a catalyst for agro-food entrepreneurship and innovation, to promote interregional cooperation of the partners, to strengthen the competitiveness of the industries in order to better meet the specific requirements of consumers arising from the market.

Moreover, the creation of cooperative mechanisms between research units and enterprises, as well as between enterprises in the RIS sectors is one of the specific objectives of the ROP 2014-2020.

Thus, in the region of CM, there is mobilization in the direction of the circular economy, as numerous SMEs are already showing considerable interest in developing synergies and implementation of relevant projects. Successful circular economy applications and best practices are already evident in the region, as stakeholders showed in the meetings of the Local Support Group.

Especially, for the biowaste stream applications, the survey conducted for the BIOREGIO project revealed two facts that can form the basis for cooperation in the sector: the fact that all biogas plants use anaerobic digestion technology and the fact that they use almost only livestock farming waste and animal by-products.

The Region of Central Macedonia has a significant production of biowaste of different categories, that add up to 2.015.000 tons per year. Especially, organic agri-food waste and residues amount to 433.500 tons per year while livestock farm wastes amount to 1.330.500 tons per year and animal by-product amount to 33.900 tons per year. These biowaste streams are not being currently fully integrated in a circular model of management in the Region, as the Local Stakeholders Group meetings have revealed.

Thus a major need was identified to strengthen on one hand the value chain of biowaste and create contacts and synergies among biogas plant operators and producers of other forms of biowaste and on the other hand to bring together biogas plant operators in order to exchange information and pursuit common goals in the anaerobic digestion technologies.

The RCM and the local stakeholders draw inspiration and transferred from the BIOREGIO project ways of institutionalizing cooperation mechanisms for specific biowaste value chains and/or technologies: a cluster regarding the anaerobic digestion value chain, providing services of communication, information, support for plant and technology improvement and exports (good practice: Methatlantique cluster), a cluster for effective cooperation between regional and municipal authorities, universities and research institutes, district heating enterprises, wood and boiler manufacturing industries, distribution and sales companies of biomass, forestry and agricultural cooperatives in sectors such as, energy utilization of biomass for domestic and industrial use, utilization of waste (forestry, agricultural, urban and food industries waste) for the production of clean energy,

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<sup>2</sup> Vanhamaki, S., Medkova, K., Malamakis, A., Kontogianni, S., Marisova, E., Huisman Dellago, D. & Moussiopoulos, N. (2019). Bio-based circular economy in European national and regional strategies. *International Journal of Sustainable Development and Planning*, 14 (1), 31-43. <https://www.witpress.com/elibrary/sdp-volumes/14/1/2392>



through information actions, consulting and transfer of know-how in the area and implementation of pilot actions in the framework of participation in European programmes (good practice: CLuBE).

Specifically, the Méthatlantique complex in the region of Pays de la Loire, France provided to the Region of Central Macedonia insights for establishing the objectives and setting-up the services of a value-chain cluster:

- Develop a strong industrial Anaerobic Digestion (AD) sector in the region, connected to the entire value chain.
- Provide expertise and information on any domain related, by supporting the development of new AD plants and improving existing ones.
- Give new value to the sector, by exporting know-how.

#### 4.2.2 Nature of the action

The Region of Central Macedonia will explore the creation of a support structure for the biowaste value chain in the region, similarly as the good practices CLuBE and Methatlantique. The aim of the action is to encourage the acquaintance, interactions and connections among the enterprises of the region operating in the biowaste value chain, in an institutionalized way. The long term objective is to establish a structure that will take a coordinating role and serve as a focal point for the biowaste value chain in the Region of Central Macedonia and support the specification of priorities and actions in the efficient closure of the biowaste loops and side-streams in the next programming period (2021-2027)

Already, the RCM through the experience and actions of the S3 platform has acquired capacities for the coordination and development of value chains. For the implementation of the action in the RCM the following specific activities are required.



#### 4.2.3 Stakeholders involved

The actors involved in the implementation of the action are part of the Local Support Group. In the framework of the meetings of the local group and utilizing the experience of corresponding good practices that emerged in the interregional seminars of the BIOREGIO project, the initial roles of the stakeholders are distributed according to the table below.



Stakeholder	Activity (Role)
<b>Region of Central Macedonia</b>	<p>It is the owner of the action and given its role as a planning and implementation body of policies it undertakes the coordination of the action.</p> <p>It undertakes the housing/incorporation of the support structure for cooperation in the energy utilization of biowaste.</p> <p>Signature of the cooperation agreement</p>
<b>Aristotle University of Thessaloniki - Laboratory of Heat Transfer and Environmental Engineering</b>	<p>Introduction and exchange of relevant good practices</p> <p>Raising public awareness (researchers-business)</p> <p>Drafting the cooperation agreement</p>
<b>Enterprises in the biowaste value chain / associations - bodies</b>	<p>Providing direct knowledge of the market they represent</p> <p>Linking to central administration and neighbouring regions</p> <p>Lobbying</p> <p>Signature of the cooperation agreement</p>

#### 4.2.4 Timeframe

The total timetable of the action amounts to two (2) years, from 1<sup>st</sup> of January 2020 to 3<sup>rd</sup> of December 2021. During the 1<sup>st</sup> year of implementation the necessary networks and collaborations through information and workshop/meetings will be developed, while at the 2<sup>nd</sup> year the cooperation support structure is expected to be institutionalized.

Activities	Semester			
	A2020	B2020	A2021	B2021
2.1. Business information and awareness				
2.2. Workshop/meetings of stakeholders				
2.3. Signature of the agreement between support structure - businesses				
2.4. Drafting a biowaste streams utilization roadmap				

#### 4.2.5 Costs and funding sources

The total cost for the implementation of the action is estimated at 50.000€ and includes expenditure on promotion and training and third-party services.

nr.	Expenditure	Cost
1	Information and publicity (promotion material, social media, newsletter)	1.000€
2	Speaker for workshop	1.000€
3	Organizing 2 workshops (organizing support, space renting & other equipment, program configuration, sending invitations, photographing, secretarial support, minutes, catering etc .)	3.000€
4	Coordination services for the structure (man-effort and equipment)	25.000€
5	Services for drafting the roadmap	20.000€
	SUM	<b>50.000€</b>

The funds for the above expenditure will come from own resources of the RDF-RCM and /or the ROP CM.

## 5. Monitoring of the Action Plan

The following quantitative indicators of outputs and results are proposed for monitoring the implementation of the actions.

Indicator	Type	Actions	Source	Target
<b>Number of enterprises informed</b>	Output	2.2. Workshop/meetings of stakeholders	List of participants	50
<b>Number of enterprises participating in the support structure</b>	Result	2.3 Signature of the agreement	RDF-RCM	15
<b>Number of SMEs cooperating with research institutes</b>	Result	Action 1	Managing Authority OP RCM	10

The estimation of the target value of SMEs cooperating with research institutes is based on the recording of enterprises in the RCM, which are active in the sectors of utilization of bio-waste for energy production and production of fertilizers/improvers and their respective needs.

The monitoring period of the action plan of the BIOREGIO Project for the Region of Central Macedonia is from 1/1/2020 to 31/12/2021. During the monitoring period, the implementation of the actions and the achievement of the targets will be assessed every six months, during the meetings of the Local Support Group. At the same time,



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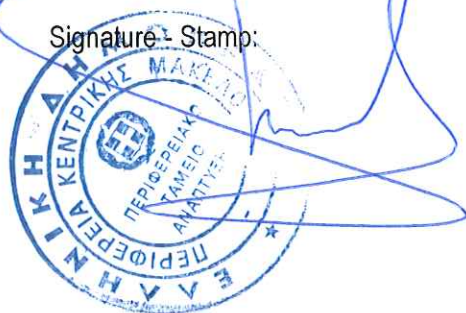
the achievement of the objectives will be recorded in the reports to the Joint Secretariat of the Interreg Europe Programme.

## Signature

Date: 23-10-2019

Name, title: Apostolos Tzitzikostas, Governor of the Region  
of Central Macedonia.

Signature - Stamp:





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