Digital innovation and circular economy ecosystems analysis

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CEI BOOST – Boosting Circular Economy Innovation through emerging technologies application

The CEI BOOST – Boosting Circular Economy Innovation through emerging technologies application project aims to increase the use of digital innovations to support the circular economy. The goal is to enhance the development and implementation of sustainable digital solutions in the circular economy, especially in relation to new technologies, and to ensure that the solutions are used to accelerate the transition to a sustainable circular economy. The countries participating in the project are Bulgaria, Finland, France, Greece, Lithuania, Portugal, Romania, Spain and Sweden.

Digitalization is a wide spectrum, and most people and companies use digital solutions to some extent. However, the degree of use and purpose varies. Digitalization should be looked at as a whole, when e.g., developing the level of digitalization in the businesses. It would also be beneficial to have a strategic approach.

Common everyday solutions which combine circular economy and digitalization we use are applications and platforms. We have city bikes, online flea markets and apps to purchase surplus lunch. On the bigger scale, our waste goes through a massive waste separation plant, that separates recyclable items from the waste stream with the help of separators, magnets and optical sorters using the state-of-art technology.

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While policymakers are yet to actively link digitalization with wider sustainability efforts when developing policies and financing projects, there is a growing need to align the circular and digital agendas. The Green Deal recognises that circular economy and strong involvement from industry is central to making the EU's economy sustainable.

The CEI Boost project aims at improving policies for easing and speeding up the twin transition to ensure that Green Growth and Digital Transformation go hand in hand to drive regions' recovery and prosperity. The project focuses at enhancing policies conditions in 9 countries for boosting the application of emerging digital innovations to support the growth of circular economy at regional, local or national level, gathering expertise from different regions, different levels' policymakers and leading innovation ecosystems' actors. (CEI Boost 2023)

One of the first activities of the project has been to identify the actors and stakeholders related to both digitalization and the circular economy, and to analyse the current state and maturity of the regions in digitalization and circular economy.

The analyses by the regions highlight potential projects and approaches that have already exploited the potential of digitalization to boost sustainable development and the circular economy in particular.

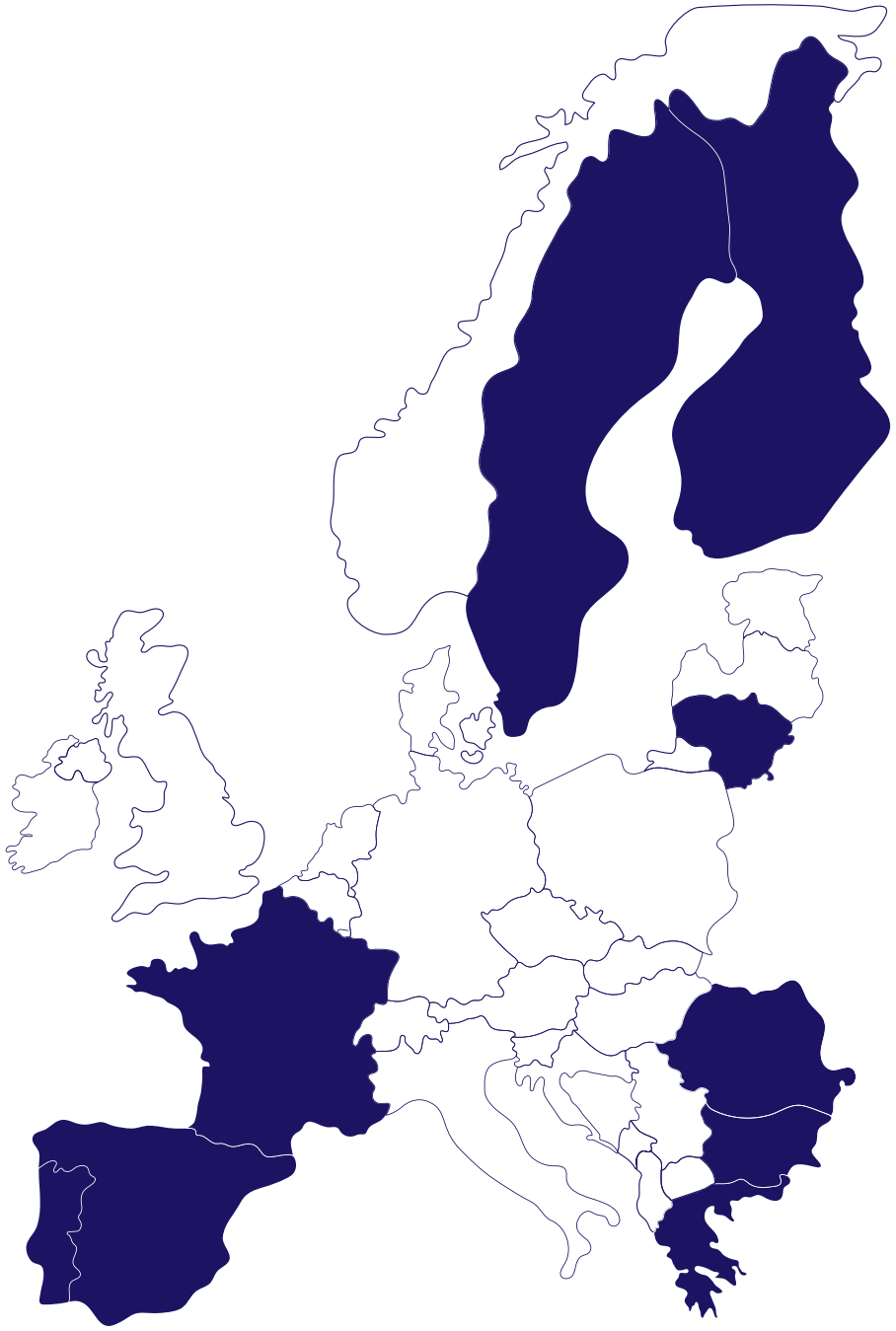
The analysis shows that the level of maturity of the regions in the field of digitalization and circular economy varies, but the general observation is that all the regions included in the analysis have made recent progress and many policies and potential projects are underway and recently initiated. On the other hand, the full potential of digitalization to promote and boost the circular economy has not been exploited.

In conclusion, the analysis carried out confirms the need for policies and development work that uses digitalization in an intelligent, user-driven and justified way to boost the circular economy.

This document analyses the current state of Digital Innovation and Circular Economy in the Region of Western Greece. The analyses of each partner region and more information of the CEI Boost can be found on the project website: *interregeurope.eu/cei-boost*

CEI Boost Partners

Sweden	Region Västerbotten
Finland	Regional Council of Päijät-Häme LAB University of Applied Sciences
Lithuania	Public Institution Lithuanian Innovation Centre Innovation agency
Bulgaria	Business Agency Association
Romania	Institute for Research in Circular Economy and Environment “Ernest Lupan” West Regional Development Agency
Greece	Industrial Systems Institute
Spain	Tarragona Provincial Council
Portugal	Business Development Institute of the Autonomous Region of Madeira
France	Laval Mayenne Technopole



The Region of Western Greece

The Region of Western Greece is Greece's gateway to Western Europe and occupies an important geostrategic position while been connected to major urban centers such as Athens. It is rich in natural resources and cultural heritage, and its diversity and climate offer an abundance of activities.

The Region consists of approximately 655,000 inhabitants and is divided into three Regional Units, each with unique characteristics. Achaea unit has a long and important industrial tradition as it is the industrial and research center of the Region, constituting it a host city for businesses, while Aetolia-Acarnania and Elis are the predominantly rural areas of the Region offering fertile soil for traditional agricultural products.

Digital innovations and digitalization in the Region of Western Greece

The priorities for the Region of Western Greece (RWG) are access to high-speed networks, digital transformation of business and strengthening technological competence and readiness to face Industry 4.0 challenges, as well as the digital transformation of the public sector. Through the Regional Operational Program "Western Greece 2021-2027" the Specific Objective 1ii was set to support digitalization in the region, targeting:

- Technological upgrade of businesses for their digital transformation.
- Business plans for development/commercialization of novel products and value-added services.
- Digitization and Productive Utilization of Data using IT technologies.
- Utilization of Data using technologies for improving services to citizens /businesses.

RWG focuses on integrating Industry 4.0 principles and methods in a wide range of activities and aims to create high skilled workforce, as well as investment in digital production equipment. The business sector in RWG appears to have noticed but is unable to keep up. RWG aims for its transformation to a smart and efficient European Region, which will be a supra-local hub of technology, innovation, research and creativity, and identifies 3 key areas: Agrofood, Tourism & Culture, and Advanced Materials. RWG promotes digital innovation and activities towards creating a digital innovation hub that will support digital transformation.

Status of circular economy in the region

RWG's "Regional Annual Action Plan'' aims to influence available policy tools towards a circular economy, with special focus on the Regional Operational Programme (ROP). RWG has published E-Mobility, Circular Economy and Smart Industry guides, to gather related know-how and experience in RWG, as well as information on areas of great interest. Various R& D projects have been developed toward the main directions of RWG's Smart Specialization Strategy (RIS3) and especially in "Strengthening green businesses & recycling" in Western Greece. Some specific examples include: 1) there is developed

an industrial unit to reuse coffee residue is the industrial area of Patras; 2) The Municipality of Nafpaktia is active in waste management and participates in LIFE-IP CEI-Greece. 3) A Regional Climate Change Adaptation Plan was produced. 4) For sustainable urban mobility, urban interventions were financed, e.g. for electric buses.

Based on new directions and the existing Regional Waste Management Plan, RWG aims to complete the necessary actions to strengthen sorting at the source, recycling of all types of waste produced, and the prevention of waste generation. The ROP of RWG emphasizes the development of Green Points and recycling sites. Finally, there is a growing number of related SMEs and social cooperatives, with 70 new businesses licensed for waste treatment/management, recycling and biomass for energy production.

Digitalization boosting circular economy

Efforts towards digitalization and boosting CE in RWG have focused on energy, mobility, agrifood, environmental protection, and waste. Via the "ESmartCity" project, several synergies were initiated, which also led to the publication of guides for E-mobility, Circular Economy and Smart Manufacturing. At a local government level, municipalities like Patras and Nafpaktia are participating in networks like the Intelligent Cities Challenge, as well as the LIFE-IP CEI-Greece, which aims to accelerate the CE transition in Greece. Patras has led activities such as the deployment of smart sensors to monitor the quality of the urban environment, the use of smart city systems for sustainable urban mobility, as well as the utilization of smart waste management systems. RWG has investigated the management of waste streams, the issue of a Regional Waste Register and industrial symbiosis processes.

As regards energy, SMEs like Meazon are providing smart city-related solutions and support local municipalities in energy saving, mainly in public buildings and road networks. Such solutions have enabled environmental/urban mobility data collection, while allowing open data management by the RWG. The local innovation ecosystem supports the digitalization of the agrifood sector. SMEs like Rezos Brands and Aeroponics Hellas are working on approaches to adapt to the Mediterranean conditions for production with minimal use of resources.

However, the combination of digitalization and CE appears to be relatively weak compared to the sectors of digitalization and CE in general in the RWG, since, thus far and apart from smart city platforms, the deployment of such solutions is limited mostly to small-scale/demo installations, and has not entered mainstream adoption in RWG.

Stakeholders of digitalization and digital innovation in the region

Policy makers

- Region of Western Greece
- Municipality of Patras
- Municipality of Nafpaktia

Associations & other organizations

- Association of Industries and Enterprises of Peloponnisos and Western Greece
- Achaia Chamber
- Helia Chamber
- Etoloakarnania Chamber
- Geotechnical Chamber of Greece
- Technical Chamber of Greece / Regional Department of Western Greece
- Agrifood Partnership, Western Greece Region
- Computer Technology Institute & Press "Diophantus"
- Patras Science Park

Academia

- University of Patras
- University of the Peloponnese
- Hellenic Open University

Companies

- Citrix
- FibAir
- Deloitte Patras, Innovation Hub
- Gaia Robotics
- Meazon
- PwC, Patras Offices
- Rezos Brands
- Yodiwo

Stakeholders of circular economy in the region

Policy makers

- Region of Western Greece
- Municipality of Patras
- Municipality of Nafpaktia

Associations & other organizations

- Association of Industries and Enterprises of Peloponnisos and Western Greece
- Achaia Chamber
- Etoloakarnania Chamber
- Helia Chamber
- Agrifood Partnership, Western Greece Region
- Aeiplous Institute
- Institute of Chemical Engineering Sciences

Academia

- University of Patras
- University of Patras, Institute of Circular Economy and Environment
- University of the Peloponnese
- Hellenic Open University

Companies

- ADVENT
- Aeroponics Hellas PC
- Coffee eco
- Coffee Island
- Enaleia
- Gaia Robotics
- Helbio
- Liofyllo
- Rezos Brands

Stakeholders boosting circular economy with digitalization

Policy makers

- Region of Western Greece
- Municipality of Patras
- Municipality of Nafpaktia
- Associations & other organizations
- Association of Industries and Enterprises of Peloponnisos and Western Greece
- Achaia Chamber
- Etoloakarnania Chamber
- Helia Chamber
- Aeiplous Institute

Academia

- University of Patras
- University of the Peloponnese
- Hellenic Open University

Companies

- Aeroponics Hellas PC
- Deloitte Patras, Innovation Hub
- Gaia Robotics
- PwC, Patras Offices
- Rezos Brands

Summary

The current status as regards the transition to a circular economy and digitalization in RWG follows the general respective trends in Greece. On the positive side, there is an expanding ecosystem in RWG comprising business, academia, research and innovators, that helps to accelerate this transition, as well as overcome cultural barriers and lack of awareness, both in the public and in local government. Moreover, specific related objectives have been set within the Regional Operational Program of RWG and concrete support actions have begun to materialize the business sector both in terms of digitalization and circular economy-related aspects, while also local stakeholders participate in flagship actions related to the circular economy. However, while a set of strategies and action plans have been set at a national and regional level for the near future, the current pace of the transition to a circular economy still appears to be behind other EU countries and needs to accelerate.

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