

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.

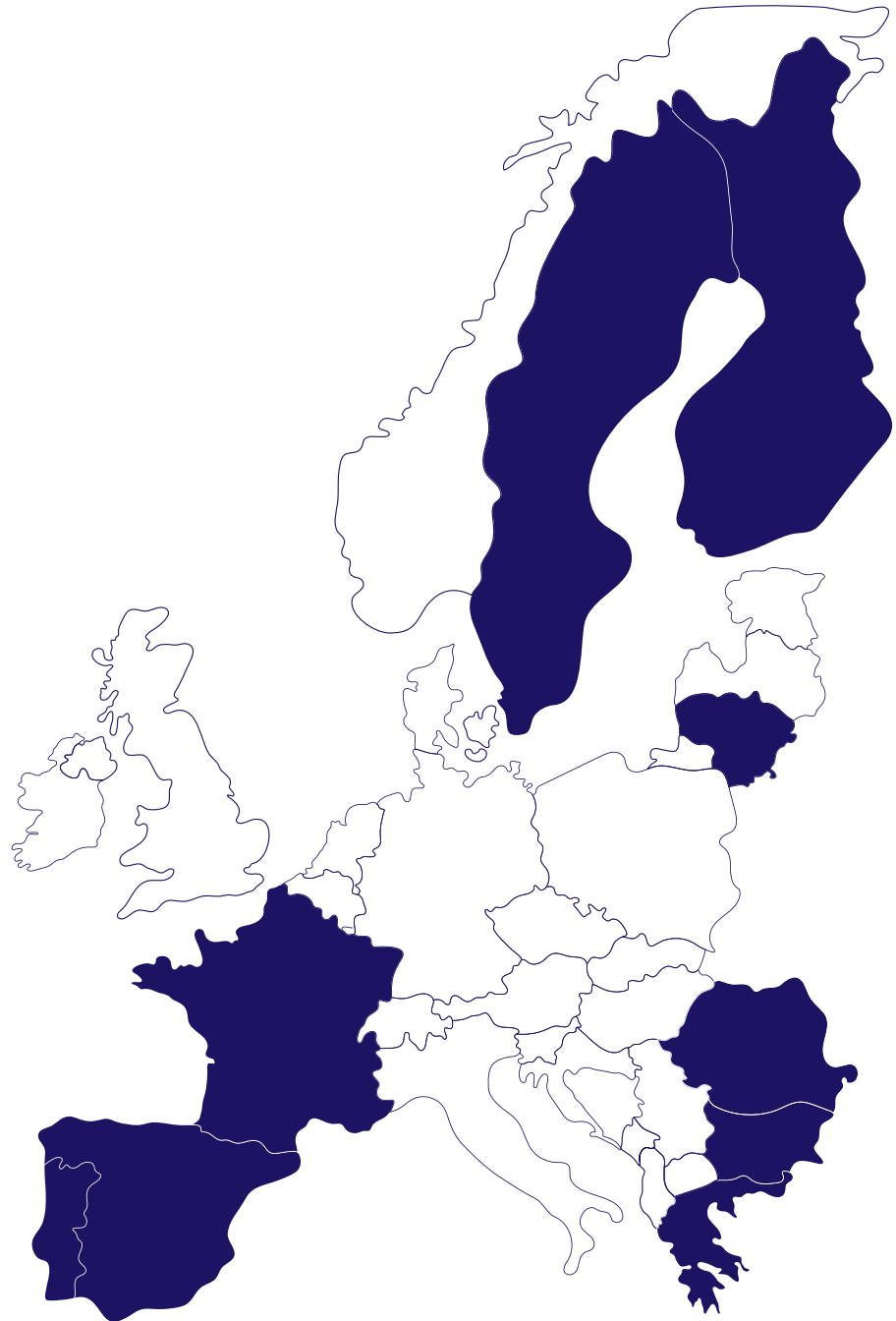
The analysis shows that the level of maturity of the regions in the field of digitalization and circular economy varies, but the general observation is that all the regions included in the analysis have made recent progress and many policies and potential projects are underway and recently initiated. 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 West Region Romania. 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



West Region Romania

West Region Romania is situated in the Western part of the country, bordering both Hungary and Serbia. The region is made up of four counties, and includes a total of 42 cities (62% urban), with a total area of 32,034 km². With a population of 1,668,921 inhabitants, the employment rate is currently 72.3% and there are more than 53,000 different companies active from a wide range of sectors.

Most companies operate in the services sector, construction and manufacturing industry and more than half of all jobs are in industrial sectors. ITC, automotive, sustainable construction and energy efficiency, as well as agrifood, tourism, health, cultural and creative industries are important employers in the region.



Digital innovations and digitalization in the West Region Romania

Romania ranks the last according to the DESI 2022, but at regional level there are some concrete aspects that we can mention. In 2021 West RDA released a pilot Study on companies digitalisation index measuring the human capital, connectivity, technologies integration and internet usage.

The general conclusion showed that:

- the Regional digitalisation Index is 57.86;
- the lowest digitization is recorded in the Agriculture (37.74), Real Estate (43.69) and Construction (44.68) sectors;
- there is a gap between urban and rural which is less digitalised.

The general conclusions shaped the EDIH and the policy making approach in the region.

Future prospects for promoting digitalisation in the region

Main regional initiative regarding digitalisation is the EDIH project named DIGIVEST (https://adrvest.ro/digital_innovation_hub/).

It is designed to act as a coagulator between: the digital expertise of the members of the Regional ICT Cluster, partnership facilitation expertise of the Tehimpuls Association and the management and program management and international reach of West RDA.

DIGIVEST is aiming to support a transversal digitalisation among smart specialisation sectors like manufacturing, HORECA, Health, agri-food and construction. From the targeted sectors, manufacturing, HORECA, agrifood and construction have the highest potential for digitalisation in their current operations. For these sectors the services that will be provided will cover:

- process/ product innovation for manufacturing;
- waste reduction (HORECA);
- precision agriculture;
- optimising the use of resource and digital project management (construction).

Policy instruments for boosting digitalization in the region

Furthermore, the West RDA is the main regional policy maker, providing funding for companies regarding services, production and digitalisation. The main policy instrument is the Regional Program 2021-2027.

Under the Priority 1, Specific objective 3 *Stepping up sustainable growth and increasing the competitiveness of SMEs and creating jobs for SMEs* there is an allocation of 270,2 Mil Euro for grants strictly dedicated to SMEs. Digitalisation of SMEs is targeted in a dedicated call with an allocation of 15,38 Mil Euro.

Under this priority West RDA support SMEs adopt digital technologies to increase their digital intensity, in particular:

- Purchase of ICT hardware equipment;
- Acquisition of licenses;
- Investments in custom applications, including automation solutions;
- cyber security services;
- Online trading platforms;
- hosting and storage services;
- The use of modern technologies e.g. blockchain, big data, virtual reality;

All other calls targeting SMEs will include investments in digital technologies as well, additional to the ongoing investments.

Access to IT specialists is achieved predominantly through outsourced contracts with specialist firms, and approximately 40% of enterprises encounter difficulties in terms of access to IT specialists.

In Romania the IT specialists' salaries are exempted from taxes to incentives verification of talent. This incentive generated a constant number of graduates of IT specialisations from universities. As such access to IT talent is enabled. However, with increasing demand the IT salaries constantly increased

too and reaching levels that far too competitive for SMEs, and financial support for access to expertise is becoming essential.

Analysis of the digital innovations and digitalization in the region

Regarding the transformative effect of digitalisation in the businesses, our regional analysis showed the main digitalisation goals at company level as follows:

- support the invoicing automation between business partners (59,6%);
- reducing the administrative burden with the public authorities.
- increase online presence (44.6%).

The greatest level of digitalisation can be observed in the financial sector. At the opposite pole is the Agricultural sector, where manual operations are still the norm (starting from planning, mechanised production, traceability, to invoicing and distribution).

Circular economy in the West Region Romania

There is no explicit Strategy regarding circularity in West Region. However, the concept is promoted transversally, both in the RIS3 and in the Regional Programs 2021-2027, especially since manufacturing sector, the biggest exporter and also employer, is a critical contributor to West Region's GDP. The prioritization of circularity at policy level is reflected also by recent fiscal and regulatory demands on industry to limit/reduce operations that impact on the environment the most. In West Region, the construction sector, especially housing, is the most affected since it has the least capacity to meet the new regulatory framework conditions. Biggest investments in the construction sector target mainly the energy efficiency and smart buildings than recycling of construction materials and optimisations of material consumption.

Future prospects for promoting circular economy

West RDA's participation in the Enterprise Europe Network (EEN), is offering the opportunity to provide sustainability services towards companies. They consist in assessment, providing information on legislation and standards, finding partners and innovation technologies for greener, cleaner, more sustainable business models.

Another sector specific initiative where West RDA is involved is FOODRUS project. Funded by Horizon 2020, the project aims to create resilient food systems in Europe through circular

solutions that prevent food losses and waste. The tools mapped and tested under the project range from good practices, methodologies, data gathering and analyses, innovations mappings, educational and awareness raising materials, to testing digital technologies to reduce food waste in the entire food supply chain (IoT, blockchain, etc). West Region is a follower region and will promote the set of tools developed within the project at regional level to enable adoption and adaptation. Potential pilot projects may result, which could be funded under the PRV 2021-2027 Program in the aftermath.

Policy instruments for boosting circular economy in the region

Within the Regional Program Vest 2021-2027, Objective one *Innovative and competitive region, the development of circularity competences* is specifically targeted to be supported by the entrepreneurial ecosystem. The objective is to develop a mechanisms and tools that stimulate the innovation in SMEs, to support innovation activities and R&D within SMEs and reduce the existing gap in terms of innovation and digitization. For these purposes, the activities that will be funded will consist of: development and/or adoption of advanced technologies: block-chain, big data, cloud computing, IoT, advanced manufacturing, robotics, artificial intelligence, cyber security, 3D printing, advanced production methods, sustainable technologies and circular economy, marketing or organizational innovation, etc.

Circularity is foreseen as a tool to be used by companies when preparing proposals under specific calls for microenterprises

(both production and services). This allows companies to perform eligible activities related to:

- recycling materials already available in the market as waste and expanding recycling activity;
- investments in the efficiency of the eco-design of products, so that their life span is extended, the degree of repairability increases, and the recycling of component materials is possible easily and with increased yields;
- promoting reuse and stimulating the use of ecological products.

The allocation available sums 36,33 Mil Euro.

Status of circular economy in the region

There are structural challenges with circularity first of all generated by the needs of developing the civil infrastructure, entrepreneurship and the abundance of funding from different sources: Regional Program, Resiliency Program, Just Transition.

All these instruments will generate construction sites, increase the production of concrete and furthermore, the construction regulations are making compulsory for the construction companies to recycle 70% of the waste materials.

Secondly, the Agrifood sector and especially the big meat producers had to structurally face the challenge of managing biological waste through investment.

Thirdly, the manufacturing is generating a lot of plastic materials as the production goes up and West Region continue to be a leading exporter.

Still, there is a favourable RDI framework towards circularity since all major universities, technical and agricultural are supporting innovation activities related to circularity and environment and improved their collaboration with the industry on product and process innovation.

Digitalization & Circular economy

Although there is no dedicated strategic approach at policy level on the capitalization of digitalisation to incentivise circular economy, for West Region both concepts are considered as transversal priorities across industries as enablers of competitiveness, specialisation and innovation.

Examples of applications of digital solutions which favours increased circularity have been collected during the consultation process for the EDIH *DIGIVEST*, and include:

Eta2u

- Digitization of production processes for global efficiency reporting
- Traceability of production processes
- Low voltage current consumption monitoring
- Smart metring of water consumption

Ascent Soft

- Automation through ERP for invoicing, production order, production management, pre-calculation and delivery notice for metal processing factories
- Own integrated system for vegetable, fruit and viticulture that integrates production with the market and stock management

Soft Net

- RP, WMS, BI IMT in the furniture industry
- ERP, BI applied in the field of sausage production
- Sales Force Automation, ERP, WMS, BI in the field of viticulture
- ERP civil infrastructure construction company

Sphinx IT

- Digital transformation of a group of agro companies, distinct entities with intercompany processes and BI for reporting at group level

Irian

- Multi-module platform integration for construction company, linking material production with delivery, on-site material management and float fuel management

Stakeholders of digitalization and digital innovation in the region

Companies

- [Eta2U](#)
- [Ascent Soft](#)
- [Soft Net](#)
- [Sphinx IT](#)
- [Irian](#)

Policy makers

- [West RDA](#)
- [County Council Timi](#)
- [Timișoara City Hal](#)

Academia

- [Timișoara Politechnica University Timișoara](#)
- [West University Timișoara](#)
- [University Aurel Vlaicu Arad](#)

Associations

- Regional ICT Cluster for West Region Romania

Stakeholders of circular economy in the region

Companies

- [Retim – main local collector and recycler](#)
- [Aquatim – local water distribution and sewage company](#)
- [Total recycling – private recycling company](#)
- [Denkstatt Romania – consulting company](#)

Policy makers

- [West RDA](#)
- [Timișoara City Hall](#)
- [County Council Timis](#)
- [Timiș Environmental Protection Agency](#)

Academia

- [Timișoara Politechnica University Timișoara](#)
- [West University Timișoara](#)
- [University of life sciences King Michael Timișoara](#)
- [University Aurel Vlaicu Arad](#)

Associations

- [Chamber of Commerce Industry and Agriculture Timis partner EIT Climate KIC](#)

Stakeholders boosting circular economy with digitalization

Companies

- [Eta2U](#)
- [Soft Net](#)
- [Sphinx IT](#)
- [Irian](#)

Policy makers

- [West RDA](#)

Academia

- [Timișoara Politechnica University Timișoara](#)
- [West University Timișoara](#)
- [University of life sciences King Michael Timișoara](#)
- [University Aurel Vlaicu Arad](#)

Summary

Adopting large scale Circular Economy practices for West Region, within the industrial ecosystem and especially in the urban area may have the potential of completely changing the environment. The manufacturing activity and agriculture are holding important shares from the regional economy but they contribute to the general pollution thus affecting the quality of life in the urban environment.

Although there is no official regional agenda/strategy/ roadmap tackling only circularity in relation to digitalisation, policy makers are fully aware on the concept and implications. This translates into promoting circularity as a condition in funding towards industry.

The main enablers of the change are the ICT companies which already have experience in business process management and managed to translate this competence into concrete industrial activities both manufacturing, agriculture and construction. Still the gap consists in the role of the RDI system in mainstreaming some circularity services and in the presence of active associations specially dedicated to circularity, that could steer the adoption of circularity in traditional sectors.

Also, there is a huge potential related to the presence in our region of a specific geographical area, with a former industrial mining profile, that is currently eligible for the Just Transition Program. This is a major change and is being backed by a special program funding Integrated Territorial Investment.

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