

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.

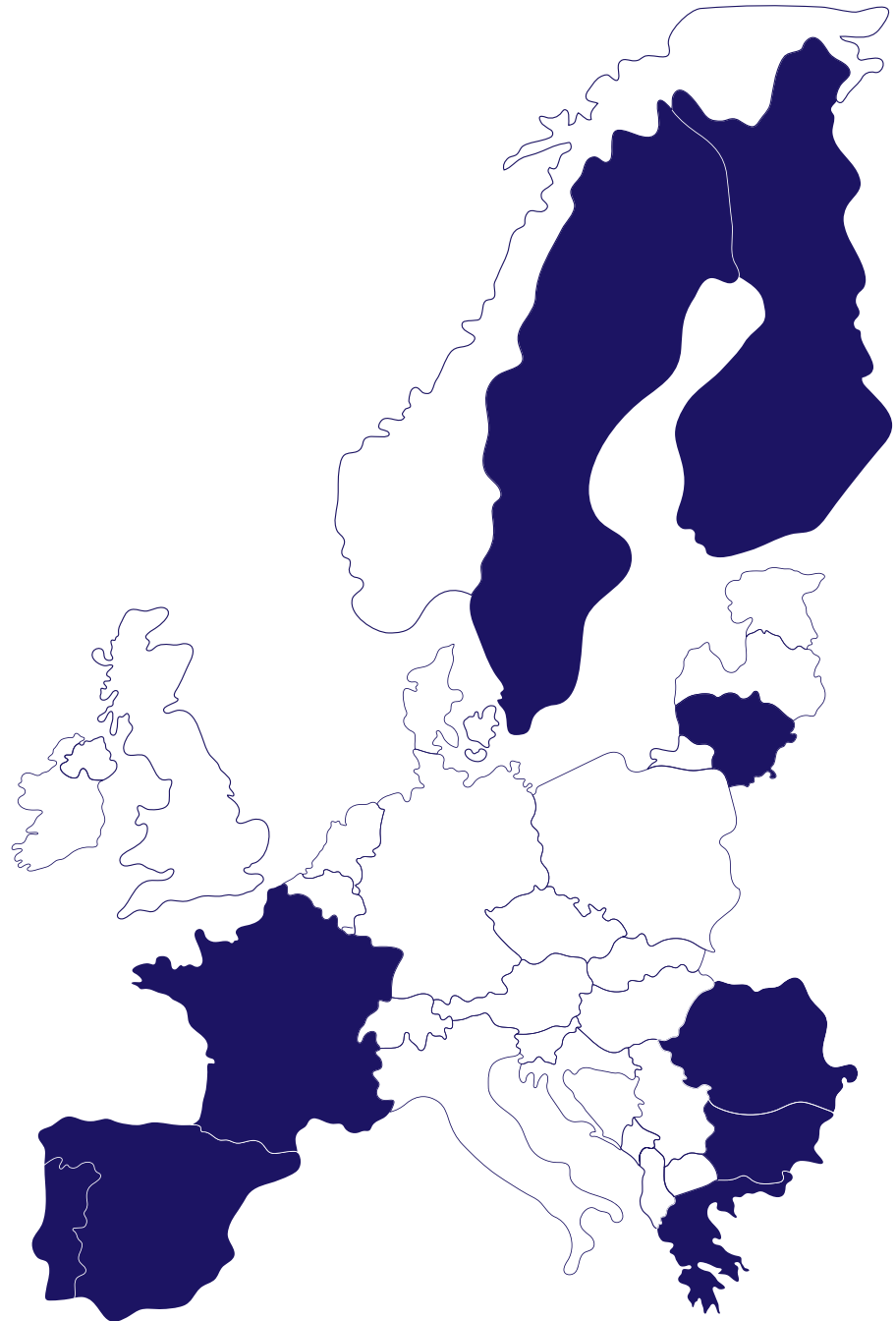
The analysis shows that the level of maturity of the regions in the field of digitalization and circular economy varies, but the general observation is that all the regions included in the analysis have made recent progress and many policies and potential projects are underway and recently initiated.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



Lithuania

Lithuania with the capital Vilnius has 2.8 million inhabitants and consists of 10 counties each of which has its own industrial competencies. The manufacturing industry plays an important role in Lithuania's economy, generating 20% of total GDP and employing one in six working Lithuanians.

Main sectors of manufacturing are food and beverages, furniture, wood products, textile, chemicals. Lithuania has strong agricultural, logistics, biotechnology, and laser industries as well. Slowly but steadily, the ICT sub-sector is becoming one of the most important sectors in Lithuania, as the latest data shows that sectors with biggest potential growth are IT, Fintech, global business services, and high-tech manufacturing.



Digital innovations and digitalization in Lithuania

National Progress Plan for 2021-2030 has one of the strategic objectives - to move towards a sustainable economic development based on scientific knowledge, advanced technologies, and innovation. This objective has a goal to promote the development, deployment and diffusion of advanced technologies and innovations, which supports digitisation process in the region.

The actual level of digitization of the Lithuanian manufacturing sector is moderate in the EU context, and the ecosystem for digitization is still not fully developed.

Lithuania has approved a Programme for Economic Transformation and Competitiveness Development, which is being implemented through 10 progress measures aiming to promote digitalization.

One of the progress measures “Encourage enterprises to digitise” is directly promoting digitalization of SMEs in the region and is going to be implemented through several actions, such as promotion of digital competences in AI, Cybersecurity

and high-performance computing areas, automatization of production processes, digitalization of business processes, financial incentives for start-ups and business services centres to develop RPA, AI solutions, etc. Each action is going to be transformed as a policy instrument fostering digitalisation.

According to the results from the recent research, Lithuania is currently lagging the EU in technological areas such as big data analytics, 3D printing and robotics. Lithuanian manufacturing sector stands high in technological areas such as cloud computing, IoT and artificial intelligence, compared to the average of the EU. The most digitized sectors are those in the engineering industry (mechanical and electrical engineering and machinery; electronics, metal electronics, metal products and metalworking).

Implementation of this Programme is under the Ministry of Economy and Innovation.

Status of circular economy in Lithuania

The topic of circular economy has been increasingly emphasized in associated narratives. In 2023 the Government adopted the Roadmap for the Transition to a Circular Economy in Lithuania by 2035. The Roadmap develops a targeted approach for implementing a circular economy policies framework, focusing on the six areas of intervention: industry, construction, bioeconomy, transport, waste management and consumption. The plan foresees several new investment and regulatory measures amounting to more than 213 million EUR. The new instruments will be administrated by the associated ministries as well as local municipalities.

The framework is a response to the fact that Lithuania lags in the EU context in successfully transforming into a circular economy. Recent studies demonstrate that local companies, notably in the manufacturing industry, emphasize the efficiency of material and energy resources but do not yet put the same attention to social aspects, sharing of relevant knowledge and practices as well as broader cooperation across the value chains to achieve common sustainability goals. With a relatively stable and non-increasing circular material use rate of 4, Lithuania trails behind the EU average (11,7 in 2021). The same applies to material efficiency and the use of secondary raw materials indicators.

On the other hand, Lithuania is one of the leading countries in the EU in terms of the share of recycled waste in total waste, excluding major mineral waste as well as in the generation of added value and employed persons in circular economy-related sectors.

Some positive examples include cement manufacturer cooperation with water treatment companies in utilizing waste sludge as a fuel to partly replace coal. Also, technological solutions implemented by local fertilizer manufacturer which allowed for the re-use of substantial amounts of waste heat by supplying it to the regional cities.

Digitalization & Circular economy

The digital transformation towards circular economy is relevant for all industry sectors. Recent research data show that the Covid-19 pandemic has greatly accelerated digital transformation processes within all industry sectors, but only a third of SMEs associate digital transformation with the opportunity to reduce the negative impact on the environment. The adoption of digital technologies in SMEs is primarily related to company's efficiency and productivity rather than environmental challenges.

Such industry sectors as textile could be identified as having big potential for digital solutions implementation boosting circular economy, and examples worth mentioning are representing these sectors:

“Vinted” (textile sector) is a peer-to-peer online marketplace that facilitates the purchase, sale and exchange of clothing items. The company became the first Lithuania's unicorn in 2019 November, being Europe's largest online consumer-to-consumer platform with 45M global members.

Electronic system for tracking waste movement - GPAIS (waste management and disposal system) where public institutions can track waste of each company. There are laws which define which SMEs must sign up with the GPAIS system. Usually, it depends on annual amount of waste produced and the waste

toxicity and each type of waste (e.g. carton, tires, oil, wood etc.) has to be logged into the system. This way, the inspectors can see what was done with waste in the company, how much it produced waste and what companies dispose of waste.

Despite identified good practices there are a lot of opportunities for digitalization for circular economy solutions for SMEs.

Stakeholders of digitalization and digital innovation in the region

Companies

- Rubedos
- Elinta Robotics
- Factobotics
- Robotex

Policy makers

- Ministry of Economy and Innovation

Academia

- Vilnius University
- Kaunas Technology University
- Vilnius Gediminas technical university (VILNIUS TECH)

Associations

- European Digital Innovation Hubs
- Smart Digital Solutions cluster
- Manufacturing Innovation Valley
- Visoriai Innovation Technology Park
- Engineering and Technology Industries Association of Lithuania LINPRA
- Digital sector association Infobalt
- Kaunas science and technology park

Stakeholders of circular economy in the region

Companies

- NGO Circular economy
- Green Policy Institute
- NGO Green Dot
- JSC Ekonovus
- JSC Restorie
- Ustukių malūnas
- AB Grigeo Klaipėda
- AB Plasta
- JSC Vaidva
- JSC KUUSAMMET
- JSC Ecoservice projektai
- JSC Ekobazė
- JSC Kauno švara

Policy makers

- Ministry of Environment
- Lithuanian Environmental Protection Agency
- Ministry of Economy and Innovation
- Environmental Projects Management Agency under the Ministry of Environment
- Ministry of Agriculture

Academia

- Vilnius University
- Kaunas Technology University
- Vilnius Gediminas technical university (VILNIUS TECH)

Associations

- CleanTech Cluster Lithuania
- Sunrise Valley Science and Technogoly Park
- National Green Municipalities Network
- Lithuanian Association of Regional Waste Management Centres

Stakeholders boosting circular economy with digitalization

Companies

- JSC Pakmarkas
- BODLenses
- Solitek

Policy makers

- Ministry of Economy and Innovation
- Ministry of Environment
- Ministry of Education, Science and Sport
- Ministry of Agriculture

Academia

- Vilnius University
- Kaunas Technology University
- Vilnius Gediminas technical university (VILNIUS TECH)

Associations

- Lithuanian Innovation Centre
- Innovation Agency
- Manufacturing Innovation Valley
- Sunrise Valley Science and Technogoly Park
- Kaunas Technology and Science Park
- European Digital Innovation Hubs

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