



Territorial Strategy & Instrument Benchmarking Fact Sheets on Circular Industry Futures - Consolidation

D.2.2.3

SMART CIRCUIT

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Document control

Document Summary	
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PP	Restricted to other programme participants	
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A. Executive summary

1. Project overview

SMART CIRCUIT's objective is to champion DIH network & actor's role to fast-track the uptake of digital/tech driven Circular Economy to enable a resource-efficient & competitive transition in CE manufacturing.

Project Partners (PPs) foster 3 transnational solution systems (WP1: the Circular Innovation Academy (CIA), WP2: the Circular Industry Strategy Lab (STRATLAB), WP3: the Circular Industry Factory (FACTORY)) to bring multi-stakeholder (Enterprise/Policy/RTO/BSO, etc.) benefits & deliver a transnational approach at the intersect of digital/RIS3/circular economy strategies. PPs build capacities, reduce barriers, leverage finance & promote closing-the-loop through the identification, dissemination and implementation of key circular economy knowledge and principles within 3 key value chains (Electronics/ICT, Textile, Construction) and a combined cross-value chain (emphasizing regional specificities).

Associated to A2.2, the Circular Industry Futures Strategy Lab (STRATLAB) is linked to O2.1 (Pilot) & O2.2 (Solution) & vertically embedded in the project plan via A2.2, A2.3 & A2.4 (& evaluated in A2.5). The STRATLAB is a solution aimed at bridging a key strategic gap between policies/strategies addressing circular economy & digital industry (EU Industrial Strat & Digital Decade, the Green Deal + EU CEAP + connected work programs in HE, DEP). STRATLAB is a transparent forum of responsible stakeholders who address/implement these policies & promotes a method for reducing barriers & leveraging opportunities at the intersect of these policies (e.g. through optimised use of policy instruments & collective accountability in private & public partnership cooperation). The scaled Solution is a connected set of regional (w/ transnational impulses) multi-stakeholder forums to generate synergies in circular economy policy/regulation adoption to research & innovation smart specialisation strategies.

2. Scope of document

This report builds upon D2.2.1 (guidance document), containing 9 national, and 12 regional strategy and instrument factsheets on the circular/digital/technology divide in territory (current status & future outlook) and provides analysis of transnational strategic options for key CE value-chains, and together with 2.2.2 (Policy-Interview Series on Impressions & Considerations of Circular Industry Futures), the groundwork for the development of D.2.3.1 - 1 planning guidance to deliver 12 regional labs (& 1 joint trans. Lab), focused dialogue on how to support digital & technology-driven circular economy in CE manufacturing via success stories & instrument exchange from enterprises within & policy makers outside the territory, that will pave the way to the establishment of the STRATLAB (A2.3).

Within the STRATLAB, Policy-makers learn from each other on what are the successful strategies and instruments implemented. Thus, this document provides the PPs and the consortium with starting information on what are the main policies and instruments supporting the digital transition towards circular economy.





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Territorial Strategies and Instruments Each PP must map their territorial (regional and national) strategies and instruments Each PP capitalize on their 3 Policy Interviews to identify the key strategies and instruments Each PP consult and keep informed their Strategic Board Member Each PP fill-in 3 excel sheets:

1 general presenting the regional and national vision regarding digital-driven circularity
 1 specific on the policies existing supporting the transition towards circular economy
 1 specific on the instruments supporting the implementation of the policies & strategies



Figure 1: Territorial Strategies and Instruments - key elements from D2.2.1 Source: Project Generated, 2023

It should be remembered that all SMART CIRCUIT activities are interlinked, it should constantly be considered when completing all objectives. The deliverable D.2.2.3 follows D.2.2.2 and D2.2.1 (Knowledge Base Establishment), all within the STRATLAB Design Phase and is related to D.2.3.1, D.2.3.2, outlining Stratlab Pilot Phase and entering STRATLAB Solution Phase with D.2.3.3 and D.2.4.2 followed by D.2.4.3.

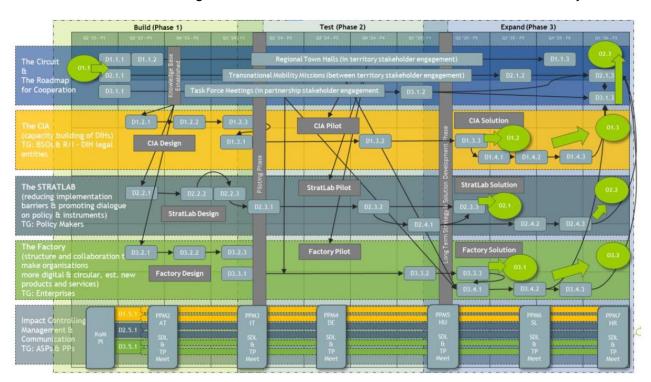


Figure 2: Project's interactions Source: Project Generated, 2023

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3. Audience

This document is directed at all project partners, who will utilize the benchmarking analysis and policy options in implementation of STRATLAB (pilots and solutions) reducing barriers and promoting the dialogue on policy and instruments, as the main outcome of the Work Package 2. It should be considered an internal document, and the appropriate status should be reflected in the "Dissemination Level" table.

4. Change Control Procedure and Structure

PP10/TUKE created this guidance document, and it is under standard project change control, whereby PPs are requested to give feedback on the stated definition or tools in writing to the deliverable responsible (here PP10/TUKE) in a timely manner. As per normal procedure, at any time partners believe a project methodology should change, the request should be brought to the work package or work stream leader (WP Leader, in this case again PP10 TUKE) and Lead Partner (in this case LP1/KPT), to consolidate feedback from other partners, and integrate and disseminate the final agreed changes. A new version of the document should be created, and recorded in the document's "Document History" table.

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B. Methodology

Within, this activity, each PP followed the set process to ensure the right completion of the task and filled the predefined Excel documents, elaborating:

- 1. Desk-research Each PP performed research on regional and national vision as well as the most relevant policies and instruments they identified (Filled-in the first Excel sheet named 1) Factsheet General Overview). This enabled the PPs to gain some knowledge on what are the main advanced policies and instruments on their territories pursuing digital-driven circularity within the manufacturing industries (especially in the three focused value chains: Construction, ICT/Electronics, Textile)
- 2. Interviews Each PP implemented their 3 Policy-Interviews as part of D2.2.2 (Filled-in the word template as running the interviews) & implemented their 5 industries/companies Interviews as part of D3.2.2 (See process in D3.2.1)
- 3. Desk research & Capitalization Each PP completed the two excel sheets associated to D2.3.2 showcasing the relevant policies and instruments on their territories and reflecting on them (Excel sheets named 2) Review existing Policies & 3)Overview Policy Instruments).
- 4. TUKE/PP10 gathered all the PPs findings and created an analysis on the transnational strategic options for the territories to learn from each other's and cooperate on the key CE-value chains. Through this report, a first estimation of the Innovation corridors should appear, acknowledging commonalities and improvements areas for each territories.

C. Insights from policy and company interviews

To gain a better insights from heretofore realised analyses, we consider the challenges identified by policymakers concerning circular transition in D.2.2.2, along with the support SMEs anticipate from policymakers in order to comply with all regulations and standards outlined in D.3.2.2.

Key takeaways from D.2.2.2 based on policymakers' feedback:

A gap in understanding the CE - There is a spectrum of interest in CE, with Poland, Germany, and Italy indicating a top priority, suggesting a robust framework for CE transition. The majority of policymakers recognize CE as important, but it competes with other priorities, indicating a need for balanced advancement. A gap in understanding the CE in some territories calls for increased education and knowledge sharing, particularly from countries like Poland, Germany and Italy where CE is recognized as a top priority.

Status Quo of Transition from Linear to Circular Economy - there is a clear spectrum of stages in the transition from a linear to a circular economy across regions, from initial phases to more advanced implementations. The emphasis on challenges such as financial constraints, lack of dedicated personnel, and the need for more comprehensive strategies are common in the feedbacks received, while opportunities







lie in technological advancements, digital transformation and increasing awareness and collaboration among stakeholders. The need for strategic policy frameworks and stakeholder collaboration emerged also as common themes, indicating key areasfor future focus and development in advancing circular economy goals across these regions: the importance of integrating circular economy principles into policy frameworks, and the role of multi- stakeholder collaboration, suggesting a need for coordinated efforts and shared strategies.

Digital infrastructure development - Digitalization is universally acknowledged as a facilitator for Circular Economy, but its integration varies, presenting an opportunity for cross-country collaboration and experience sharing. Advanced digital nations, such as Austria and Germany, could support others with less developed digital infrastructures through knowledge transfer and joint initiatives. The overarching sentiment is that digital technologies are critical for a successful transition to circularity, but they must be coupled with the right policies, infrastructure, and stakeholder collaboration to be truly effective.

Policy Landscape on CE and Digitalization - Countries are at different stages of policy development; from the responses given by policymakers, countries like Germany, Hungary and Slovakia show active policy implementation. Poland and Croatia, indicating many policies designed but not yet implemented, could benefit from partnership with these active implementers to move forward.

Policy Effectiveness Review - A disparity in policy analysis across territories highlights a need for a more systematic approach, possibly through a collaborative platform where best practices and methodologies can be exchanged.

Action Planning for Policy Implementation - Comprehensive action plans in Hungary, the Czech Republic and Croatia showcase their readiness, offering insights for countries with partial plans like Austria, Germany, and Italy. For countries like Austria, indicating partly action planning data, collaboration with Hungary or the Czech Republic could provide a framework for development.

Preparedness of Territorial Stakeholders - Slovenian policy makers displayed readiness of their stakeholders for Circular Economy, while Hungary is aware and prepared for change, both potentially serving as models for other nations. The need for stakeholder education and engagement is evident, suggesting a role for multi-country workshops and collaborative learning experiences.

D. Results and Interpretations

Given that the analysis included both quantitative and qualitative aspects and metrics, we utilized quasicorrespondence analysis to average these metrics, enabling us to identify clusters and rankings of countries and determine their overall positions.

Analysed regions (NUTS2):

PP1 Krakow Technology Park	Lesser Poland (PL)
PP2 Research Burgenland	East Austria (AT)
PP3 PROFACTOR	Upper Austria (AT)
PP4 Fraunhofer IWU	Chemnitz (Saxony) (DE)
PP5 microTEC South West	Freiburg (Baden-Württemberg) (DE)
PP6 SIIT Ligurian Technological District Integrated Intelligent Systems	Liguria (Northwest) (IT)







PP7 COMET Scrl - Friuli Venezia Giulia Mechanical Engineering Cluster	Friuli-Venezia Giulia (Northeast) (IT)
PP8 TECOS, Slovenian tool and die development centre	Eastern Slovenia (SI)
PP9 Pannon Business Network Association	Western Transdanubia (HU)
PP10 Technical University of Kosice	Eastern Slovakia (SK)
PP11 Internac Solutions	Southeast (CZ)
PP12 Croatian Chamber of Economy Varaždin County Chamber	Grad Zagreb (HR)

1. OVERALL OVERVIEW OF NATIONAL/REGIONAL/LOCAL POLICIES AND FINANCIAL INSTRUMENTS

The first section provides brief analysis of project partners from particular regions on their national vision, regional vision towards digitally driven circular economy, existing policies (international/national/regional/local) relevant in their territory and existing instruments (international/national/regional/local) relevant to implement the policies related to digital circular economy.

Key National Strategies/Policies:		
•	The National Strategy of Regional Dev	

- velopment 2030 (NSRD)
- Roadmap for the Transformation towards a Circular Economy
- State Raw Materials Policy until 2050
- National Smart Specializations (KIS)
- Productivity Strategy 2030

Key Regional Strategies/Policies:

- Regional Development Strategy Malopolska 2030
- Regional Innovation Strategy
- Waste Management Plan of the Małopolska Voivodeship for 2023-2028
- The Strategic Program for Environmental Protection

Key Local Policies:

A circular economy strategy for Krakow

Key National Financial Instruments:

- Circular Economy in Small and Medium-sized Enterprises (SMEs), Stage I
- Circular Economy it pays off
- The Smart Path
- Competition for the Best Circular Economy (CE) Solutions

Key Regional Financial Instruments:

- Innovation vouchers for SMEs
- Operation FEMP.02.01 Improving Energy Efficiency
- Operation FEMP.02.08 Support for the Development of RES
- Grants and Preferential Loans for CE Industry in Regional Programs

Key Local Financial Instruments:

Circular Economy Business - Leader of Małopolska (focus on entrepreneurs)

Key National Strategies/Policies:

Austrian Circular Economy Strategy

Key Regional Strategies/Policies:

None specified

Key Local Policies:

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East Austria (AT)

Lesser Poland (PL)







	None specified Key National Financial Instruments:
	None specified Key Regional Financial Instruments: **Proof of the Control of Cont
	Circular Futures: Plattform Kreislaufwirtschaft ÖsterreichPlattform Kreislaufwirtschaft
	 Key Local Financial Instruments: Umweltdienst Burgenland (flagship company in waste management sector)
	Key National Strategies/Policies: • Circular Econony Strategy Plan (Federal Ministry of Austria)
	Key Regional Strategies/Policies:
	 uppervision2030 (Federal Ministry of Upper Austria) Key Local Policies:
Upper Austria (AT)	 None specified Key National Financial Instruments:
	 Circular economy - 3rd call for proposals (2023) Key Regional Financial Instruments:
	 Repair, recycling and reuse initiatives Repair facilities, exchange facilities, rental facilities
	Key Local Financial Instruments:
	• none
	 Key National Strategies/Policies Nationale Kreislaufwirtschaftsstrategie (NKWS) / National Circular Economy Strategy
	Key Regional Strategies/Policies Saxon Zero-Waste Strategy and Strategy for the Implementation of the New Circular
	Economy Act
	 Updating the waste management plan (Directive 2008/98/EC, Article 28) to a circular economy plan
Chemnitz (Saxony) (DE)	Key Local Policies: • not existing
Glieffillitz (Jaxoliy) (DL)	 Key National Financial Instruments Future Centers - Supporting small and medium-sized enterprises and employees
	INNOVATIVE CLIMATE PROTECTION PROJECTS - as part of the National Climate Initiative (NKI) of the Federal Ministry for Economic Affairs and Climate Action
	Key Regional Financial Instruments • FRL Reparaturbonus/2023 // Funding Guideline for the Sustainable Use of EEE
	through Repair
	 Circular Economy Funding Guideline (FRL KrW/2024) Key Local Financial Instruments:
	not existing
	Key National Strategies/Policies: • Digital strategy of the Federal Government Strategy for a digital awakening
	Key Regional Strategies/Policies: • Digitalization strategy "digital@bw"
	 Artificial Intelligence state strategy Sustainability strategy
	State strategy "Resource Efficiency"
Freiburg (Baden-	 State strategy "Sustainable Bioeconomy" Key Local Policies:
Württemberg) (DE)	 Circular Black Forest initiative Key National Financial Instruments:
	 Future Centers - Supporting small and medium-sized enterprises and employees in the (further) development and implementation of innovative design approaches to
	cope with the digital transformation Innovative Klimaschutzprojekte im Rahmen der Nationalen Klimaschutzinitiative
	(NKI) Key Regional Financial Instruments:
	Das Digital Hub-Netzwerk Baden-Württemberg







	Key Local Financial Instruments: • not existing
Liguria (Northwest) (IT)	Key National Strategies/Policies: Strategia Nazionale Per Lo Sviluppo Sostenibile (SNSvS) Key Regional Strategies/Policies: Strategia Regionale per lo Sviluppo Sostenibile (SRSvS) Key Local Policies: Metropolitan Agendas for Sustainable Development (City of Genoa) Key National Financial Instruments: SNSvS System Key Regional Financial Instruments: Coordination Table for Sustainable Development (Ministry of Environment) Key Local Financial Instruments: CREIAMO PA
Friuli-Venezia Giulia (Northeast) (IT)	Key National Strategies/Policies: Strategia Nazionale di Specializzazione Intelligente (National Strategy for Smart Specialisation - SNSI) Piano Nazionale di Ripresa e Resilienza (National Recovery and Resilience Plan - PNRR) Strategia Nazionale per l'Economia Circolare (National Strategy for the Circular Economy - SNEC) Piano Transizione 5.0 (Industry 5.0 Transition Plan) Key Regional Strategies/Policies: Strategia di Specializzazione Intelligente e Sostenibile 2021 - 2027 (RIS4 - Smart and Sustainable Specialiszazione Strategy) Strategia per lo Sviluppo Sostenibile della Regione Autonoma Friuli Venezia Giulia (Sustainable Development Strategy of the Autonomous Region of Friuli Venezia Giulia) Legge regionale 22 febbraio 2021 n. 3 (Regional Law 22 February 2021, No. 3 - Sviluppolmpresa) FVGReen - Law no. 4, 17 February 2023 Key Local Policies: Not covered at local level in Italy Key National Financial Instruments: Piano Nazionale di Ripresa e Resilienza Investimento 1.2. Progetti faro di economia circolare (National Recovery and Resilience Plan Investment 1.2 - Beacon circular economy projects) PON Ricerca e Innovazione (National Operational Programme for Research and Innovation) Credito d'imposta riciclo e riuso (Tax credit for recycling and reuse) Credito d'imposta riciclo e riuso (Tax credit for recycling and reuse) Credito d'imposta Transizione 5.0 (Tax credit for recycling and reuse) POR FESR Friuli Venezia Giulia 2021 - 2027 (EDRF Regional Operational Programme Friuli Venezia Giulia 2021-2027) Incentivi alle imprese del settore legno indirizzati a favorire la diffusione e l'utilizzo del legno regionale nelle diverse filiere produttive e sostenere progetti di innovazione diffusa sostenibile (Incentives for companies in the wood sector aimed at promoting the spread and use of regional wood) Contributi a favore delle imprese per progetti di innovazione di processo e organizzazione (Grants for businesses for process and organizational innovation projects) Comunità Energetiche Rinnova
Eastern Slovenia (SI)	Key National Strategies/Policies:







- Circular Economy Strategy of the Republic of Slovenia
- National Strategy for Research and Innovation 2021-2027
- Digital Slovenia Strategy 2025
- Green Slovenia Strategy 2030
- Smart Specialization Strategy of the Republic of Slovenia 2021-2027

Key Regional Strategies/Policies:

- Smart specialization strategy of the West Slovenia region
- Regional development strategy of the East Slovenia region

Key Local Policies:

none

Key National Financial Instruments:

- Eco Fund Slovenian Environmental Public Fund
- Digital Innovation Hub (DIH Slovenia)
- P2 Incentives for Start-ups
- Operational Programme for the Implementation of the European Cohesion Policy
- Rural Development Programme (RDP)

Key Regional Financial Instruments:

- Just Transition Fund for the coal regions of Savinjska-Šaleška and Zasavje (special call for proposals planned)
- Eco-fund Slovenian public environmental fund
- P2 incentives for start-ups

Key Local Financial Instruments:

- For the two coal local regions of Savinjska-Šaleška and Zasavje, a special call for proposals instrument is planned
- A special call for proposals is also foreseen for the co-financing of projects in the fields of research, development and innovation projects and pilot demonstration projects

Key National Strategies/Policies:

- National Smart Specialization Strategy 2021-2027
- National Hydrogen Strategy
- · National Digitalization Strategy
- Circular Economy Strategy of the Republic of Slovenia
- Green Slovenia Strategy 2030

Key Regional Strategies/Policies:

none

Key Local Policies:

- Szombathel 2030 Municipality of Szombathely City
- Sustainable Urban Development Startegy Municipality of Szombathely City with county rights
- Sustainable Energy and Climate Action Plan Municipality of Szombathely City with county rights
- Hydrogen Strategy Municipality of Szombathely City with county rights

Key National Financial Instruments:

- Digital Renewal Operative Program Plus
- Environmental and Energy Efficiency Operative Program Plus
- The Regional and Urban Development Operative Program Plus
- Economic Development and Innovation Operative Program Plus

Key Regional Financial Instruments:

None (centralized approach)

Key Local Financial Instruments:

None

Key National Strategies/Policies:

- Program Recovery and resilience plan of the Slovak Republic
- Program Operational program Slovakia 2022-2027

Key Regional Strategies/Policies:

None in the area of circular economy

Key Local Strategies/Policies:

None in the area of circular economy

Key National Financial Instruments:

Program Recovery and resilience plan of the Slovak Republic

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Eastern Slovakia (SK)

Western

(HU)

Transdanubia







	Program Operational program Slovakia 2022-2027	
	Demand-oriented calls for funding from ESIF	
	 Awards from Foundations for environmentally responsible companies - Via bona, Felix Award 	
	Key Regional Financial Instruments:	
	None in the area of circular economy	
	Key Local Financial Instruments:	
	None in the area of circular economy	
Southeast (CZ)	 Key National Strategies/Policies: Strategic framework of the circular economy of the Czech Republic 2040 Innovation Strategy of the Czech Republic 2019-2030 The Country for the Future 2020 - 2027 Key Regional Strategies/Policies: A plan for a better region - SRJMK2021+ (Development Strategy of the South Moravian Region 2021+) Key Local Policies: Strategy #brno2050 (part Clean and circular city) - City of Brno #PripravBrno - Covenant of Mayors Territorial Energy Concept of the Statutory City of Brno Energy Management System of the City of Brno APZKO - Quality Improvement Action Plan Air Quality Action Plan Brno Key National Financial Instruments: The Circular Czech Republic 2040 Action Plan for the period 2022-2027 Key Regional Financial Instruments: 	
	 Key Regional Financial Instruments: Regional Innovation Strategy (RIS) for the South Moravian Region Key Local Financial Instruments: inter-regional/international networks e.g. 'SECAP - Sustainable Energy and Climate Action Plan - call Interactive online Map "Circular Brno" - circular local ecosystem 	
	Key National Strategies/Policies	
	National Development Strategy until 2030	
	Digital strategy of Croatia until 2032	
	 Integrated National Energy and Climate Plan for the Republic of Croatia 	
	The low carbon development strategy of the Republic of Croatia	
	Key Regional Strategies/Policies	
	Plan for the Industrial Transition of Northern Croatia	
Crad Zagrah (UD)	Key Local Policies:	
Grad Zagreb (HR)	The Strategy for the development of the Varaždin Urban area Kov National Financial Instruments	
	Key National Financial Instruments • National Recovery and Resilience Plan	
	HAMAG-BICRO Croatian Agency for SMEs, Innovations and Investments	
	Environmental Protection and Energy Efficiency Fund	
	Key Regional Financial Instruments	
	Integrated Territorial Program	
	Key Local Financial Instruments:	
	The Strategy for the development of the Varaždin Urban area	

Concerning patterns observed, Central Europe generally shows a balance between national and regional strategies, with some regions like Lesser Poland and Southeast (CZ) having well-defined local policies and financial instruments. Western Europe regions like Liguria and Friuli-Venezia Giulia have integrated local policies and financial instruments, but some areas like Chemnitz and Upper Austria lack local level implementation. Eastern Europe shows variability, with regions like Grad Zagreb having defined local policies and financial instruments, while others like Eastern Slovakia and Western Transdanubia have limited local engagement and rely more on national frameworks.







2. OVERVIEW OF EXISTING POLICIES AND GOVERNANCE STRUCTURES IN RELATION TO DIGITALLY DRIVEN CIRCULARITY

This section summarizes regional evaluations of these policies from the viewpoint of high-level vision and alignment with national context, stocktaking and underpinning methodologies, prioritizing policy intervention areas, policy domains, policy pathways and integration, policy implementation.

Region (NUTS2)	More developed aspects	Less developed aspects
Lesser Poland (PL)	Multi-stakeholder Approaches and Interagency Collaboration Support for SMEs - Existing policies include coherent strategies to address the needs and opportunities for SMEs (Regional Innovation Strategy of the Małopolska Region 2030). Detailed Analysis and Available Information: Comprehensive reviews and detailed analyses of existing policies are available, supporting the implementation of circular economy services (Regional programme European Funds for Malopolska 2021-2027). Education and Training: Basic information on existing circular economy trainings is available (Regional programme European Funds for Malopolska 2021-2027). Monitoring and Enforcement:Policies include mechanisms for regular monitoring, performance indicators, and periodic reviews to ensure effective implementation. Concrete Action Planning:Implementation is supported by concrete action planning, including responsibilities, timelines, and financial/human resources.	Long-term Vision for DIHs: There is a need for a clearer long-term vision and goal for the development and implementation of DIHs (listed in Regional Development Strategy "Malopolska 2030" but needs stronger direction). Phasing Out Pre-existing Policies: Existing policies do not adequately consider the need to phase out pre-existing policies and provide time for affected individuals and industries to adjust. Potential Negative Impacts Assessment: Policies lack comprehensive assessment for potential negative impacts over the short, medium, and long term. Change Agents in Implementation: Evidence of implementation through change agents in influential ministries and regional institutions is not clearly documented.
East Austria (AT)	High-Level Vision and Commitment: Policies like the European Circular Economy Action Plan (CEAP) and the Austrian Circular Economy Strategy demonstrate strong long-term commitments from government agencies and multi-stakeholder approaches involving the private sector and civil society. Comprehensive Policy Review: Detailed analyses of existing policies are available, including reviews of policy instruments, supporting a coherent strategy to accommodate the needs of SMEs. Market Trends and Competitiveness: Policies such as the Horizon Europe and the European Green Deal follow market trends and emphasize territorial competitiveness.	Hindrance to DIHs Implementation: Certain policies might hinder the full implementation of DIHs concepts due to legislative challenges (e.g., CEAP and Austrian Circular Economy Strategy). Integration and Impact Assessments: Integration of digital-driven circularity-related policies among different ministries is less successful, and comprehensive impact assessments are not always conducted. Phasing Out Pre-existing Policies: Existing policies do not adequately address the need to phase out pre-existing linear economy policies and provide time for affected individuals and industries to adjust.







	Monitoring and Compliance: The policies take into account the ability to monitor and enforce compliance, with regular monitoring through performance indicators, periodic reviews, and concrete action planning, including responsibilities, timelines, and financial/human resourcing.	Policy Pathways and Design: Implementation pathways for DIHs are not always clearly defined, and the support for DIHs development in policy design needs improvement.
Upper Austria (AT)	Support from Government Agencies: Policies such as the Circular Economy Strategy and European Circular Economy Action Plan exhibit strong high-level and long-term commitments from government agencies. Multi-stakeholder Approaches: These policies also apply multi-stakeholder approaches, involving government, private sector, and civil society groups. Comprehensive Policy Analysis: Detailed analyses of existing policies, including rules, regulations, and financial instruments, have been undertaken and are available. Information on Circular Economy Trainings: Basic information on existing circular economy trainings is available, supporting curriculum development	Private Sector Support: There is limited support from the private sector in policies such as uppervision2030 and the Circular Economy Strategy Clear Long-term Vision for DIHs: The long-term vision or goal for DIHs development and implementation is not clearly defined in policies Policy Integration: Digital-driven circularity-related policies are not well integrated among different ministries and existing instruments Phasing Out Pre-existing Policies: Implementation pathways do not adequately consider the need to phase out pre-existing policies fostering a linear economy
Chemnitz (Saxony) (DE)	High level vision and alignment with national context Multi-stakeholder Approaches: (Definitely Yes) Policies apply multi-stakeholder approaches and inter-agency collaboration. Long-term Vision for DIHs: (Likely Yes) The long-term vision or goal for DIHs is present but not easily understandable. Stocktaking and underpinning methodologies Detailed Analysis of Existing Policies: (Definitely Yes) Detailed analysis of existing policies is available. Basic Information of Circular Economy Trainings: (Likely Yes) Basic information of circular economy trainings is available. Policy implementation Implementation Through Change Agents: (Definitely Yes) Evidence of implementation through change agents in influential ministries and regional institutions. Regular Monitoring and Reporting: (Likely Yes) Policies are supported by regular monitoring through performance indicators and periodic reviews. Concrete Action Planning: (Likely Yes) Implementation is supported by concrete	High level vision and alignment with national context Support from Private Sector: (Likely No) Existing policies do not have sufficient support from the private sector. Circular Economy Focus: (Likely No) The vision does not strongly provide overarching direction towards circular economy. Stocktaking and underpinning methodologies Existing Policies Hindering Implementation: (Likely No) There are policies that might hinder the full implementation of the DIHs concept towards circular economy services. Prioritizing policy intervention areas DIHs Intervention: (Likely No) Existing policies do not include specific DIHs interventions. Follow Market Trends: (Likely No) Policies do not strongly follow market trends and territorial competitiveness. Policy domains and instruments Coherent Strategy for SMEs: (Likely No) Policies do not include a coherent strategy to accommodate SMEs. Economic, Environmental, and Social Benefits: (Likely No) Policies do not adequately address the economic, environmental, and social benefits of DIHs through impact assessments.







	action planning, including responsibilities, timelines, and financial/human resourcing.	Voluntary Instruments: (Likely No) Voluntary instruments in policies are not supported by a functional legislative framework.
Freiburg (Baden- Württemberg) (DE)	Strategies exhibit high-level and long-term commitment from government agencies These policies also apply multi-stakeholder approaches, involving government, private sector, and civil society groups Support for Private Sector and SMEs: Funding schemes within these policies typically request private co-financing and offer higher rates to SMEs, demonstrating robust support for the private sector and small to medium-sized enterprises (SMEs) Market Trends and Territorial Competitiveness: Policies follow market trends and territorial competitiveness, addressing key areas like wealth, sustainability, societal cohesion, digital sovereignty, and technological advancements Enforcement Activities and Monitoring: Policies ensure regular monitoring through performance indicators, mandatory reporting, and compliance with enforcement activities	Explicit Focus on Circular Economy: Although the digitalization strategy targets sustainability, it does not explicitly focus on the circular economy The National Digitalization Strategy needs stronger emphasis on circular economy aspects. Availability of Circular Economy Trainings: Basic information on circular economy trainings is less available at the national level, particularly within the "Artificial Intelligence" state strategy Phasing Out Pre-existing Policies: Implementation pathways do not adequately consider the need to gradually phase out pre-existing policies fostering a linear economy
Liguria (Northwest) (IT)	High-Level Commitment: The Strategia Regionale per lo Sviluppo Sostenibile (SRSvS), National Strategy for the Circular Economy (SNEC), and Metropolitan Agendas for Sustainable Development demonstrate strong commitment from national and regional government agencies Market Trends and Competitiveness: These policies align with market trends and territorial competitiveness, particularly focusing on diversification and high-value production Policy Alignment with National/Regional Needs: The strategies are well-aligned with the national/regional industrialization level and socio-economic needs Support for SMEs: The policies consider the needs and challenges of Small and Medium- sized Enterprises (SMEs)	Private Sector Support: Insufficient knowledge or evidence of private sector support for these strategies, indicating a need for more research to understand the private sector's involvement Specific Focus on DIHs: There is a noticeable absence of a specific section addressing Digital Innovation Hubs (DIH), which suggests a potential oversight in integrating DIHs into the broader strategic framework Circular Economy Trainings: Basic information on circular economy trainings is not detailed, indicating a need for a more targeted approach in educational initiatives Enforcement and Monitoring: Enforcement activities like mandatory reporting or KPIs are not explicitly detailed, and the implementation pathways lack clarity on how to phase out pre-existing policies fostering a linear economy
Friuli-Venezia Giulia (Northeast) (IT)	High-Level Commitment: Policies such as the National Strategy for Smart Specialisation (SNSI), National Strategy for the Circular Economy (SNEC), Smart and Sustainable Specialisation Strategy FVG (RIS4 FVG), and Sustainable Development Strategy FVG	Private Sector Support: There is insufficient knowledge or evidence of private sector support for the National Strategy for Smart Specialisation and the National Strategy for the Circular Economy







demonstrate strong high-level and long-term commitment from government agencies

Market Trends and Competitiveness: These policies align well with market trends and aim to enhance territorial competitiveness through diversification and high-value production

Policy Alignment with National/Regional Needs: The strategies are well-aligned with the national/regional industrialization level and socio-economic needs

Monitoring and Compliance: The strategies imply a commitment to compliance and monitoring, with detailed specifics on monitoring and enforcement

Explicit Focus on DIHs: The strategies do not explicitly focus on Digital Innovation Hubs (DIHs) and their roles in circular economy, making it difficult to assess the strength of the vision in this context

Circular Economy Trainings: Specific details on circular economy trainings are not provided, although there is an emphasis on education and training

Enforcement and Voluntary Instruments: Enforcement activities like mandatory reporting or KPIs and the presence of voluntary instruments within a legislative framework are not explicitly detailed

High-Level Commitment and Multistakeholder Approaches: The Smart Specialisation Strategy Slovenia demonstrates a strong high-level and long-term commitment from government agencies and involves multi-stakeholder approaches with collaboration between government, private sector, and civil society groups

Support for Private Sector: The strategy receives support from the private sector, indicating a collaborative approach towards

policy implementation

Clarity of Vision for DIHs: The long-term vision for Digital Innovation Hubs (DIHs) development and implementation is clearly defined, providing a clear future outlook

Alignment with Market Trends: The strategy aligns well with market trends and aims to enhance territorial competitiveness

Policy Alignment with National/Regional Needs: The selected policy instruments are well-suited to Slovenia's level of industrialization, environmental, and socioeconomic needs

Hindrance to DIHs Implementation: The strategy does not mention any existing policies that might hinder the full implementation of the DIHs concept towards circular economy services, indicating a potential oversight

Specific Focus on Circular Economy Trainings: Basic information on circular economy trainings is not detailed, indicating a need for more targeted educational initiatives

Enforcement and Voluntary Instruments: Enforcement activities like mandatory reporting or KPIs and the presence of voluntary instruments within a legislative framework are not explicitly detailed

Phasing Out Pre-existing Policies: The strategy does not explicitly discuss the phasing out of pre-existing policies fostering a linear economy

Western

Transdanubia (HU)

Eastern Slovenia

(SI)

High-Level Commitment: Policies such as Szombathely2030 and the Hydrogen Strategy demonstrate strong high-level and long-term commitment from relevant government agencies

Multi-stakeholder Approaches: The strategies apply multi-stakeholder approaches and interagency collaboration involving government, private sector, and civil society groups, fostering a collaborative environment for policy implementation

Support from Private Sector: There is evidence of private sector support, especially in the context of industrial restructuring and health sector development

Detailed Analysis of Existing Policies: There is a lack of comprehensive review and detailed analysis of existing policies and policy instruments, which might hinder the full understanding and effective implementation

DIHs Intervention: DIHs intervention is not explicitly included or highlighted in the policy framework, which could limit the strategic focus on Digital Innovation Hubs

Circular Economy Trainings: Specific details on circular economy trainings are not provided, indicating a need for more targeted educational initiatives







Policy Alignment with Market Trends: The strategies align with market trends and aim to enhance territorial competitiveness through diversification and high-value production

Coherent Strategy for SMEs: The strategies include a coherent approach to accommodate the needs, opportunities, and challenges associated with Small and Medium-sized Enterprises (SMEs), particularly in the context of industrial transformation and green initiatives

Enforcement Activities: Enforcement activities like mandatory reporting or KPIs are not explicitly detailed, which could impact the effective implementation and monitoring of policies

High-Level Commitment and Multi-Stakeholder Approaches: Policies demonstrate strong high-level commitment from government agencies and involve multistakeholder approaches and inter-agency collaboration, ensuring broad support and comprehensive implementation

Clear Long-Term Vision: The long-term vision and goals for Digital Innovation Hubs (DIHs) development are clearly understood, reflecting a commitment to digital innovation and supporting ecosystems for Industry 4.0 and smart cities

Prioritizing Policy Intervention Areas: Existing policies include DIHs interventions and follow market trends and territorial competitiveness, aligning with the Research and Innovation Strategy for Intelligent Specialization

Supportive Policy Instruments: Selected policy instruments are well-suited to the country's industrialization level, environmental, and socio-economic needs, providing financial incentives for green technologies

Coherent Strategy for SMEs: Policies include coherent strategies to support the needs, opportunities, and challenges of Small and Medium-sized Enterprises (SMEs), crucial for fostering innovation and economic growth

Integrated Policy Pathways: Digital-driven circularity-related policies are integrated across different ministries, ensuring a holistic approach to policy implementation

Detailed Analysis of Existing Policies: A comprehensive and detailed analysis of existing policies and instruments is lacking, which could hinder effective policy implementation and understanding

Policies Hindering DIHs Implementation: Legislation and permitting processes regarding the use of secondary ancillary sources are under development, creating uncertainty about their impact on DIHs

Circular Economy Trainings: Basic information on existing circular economy trainings is available, but there is a need for more structured and detailed training programs

Implementation and Monitoring: While there is some evidence of policy implementation, details on enforcement activities, regular monitoring, and corrective actions are not thoroughly covered, indicating potential gaps in policy execution and evaluation

Southeast (CZ)

Eastern Slovakia

(SK)

High-Level Commitment and Multi-Stakeholder Approaches: All strategies demonstrate high-level and long-term commitment from government agencies, with multi-stakeholder approaches involving government, private sector, and civil society groups. These strategies are developed into action steps managed by public institutions, ensuring broad support and comprehensive implementation Clear Vision for DIHs in Circular Economy: The vision for Digital Innovation Hubs (DIHs) related policies is not strong enough to provide an overarching direction towards the circular economy. DIHs are established more for digitalization support than for addressing circular economy issues

Information on Circular Economy Trainings: There is a lack of basic information on existing circular economy trainings, with companies showing blindness towards upcoming







Support for Circular Economy: The strategic framework of the circular economy and other related strategies include detailed financial instruments and challenges that businesses can take advantage of, indicating strong support for the circular economy.

Policy Pathways and Integration: Policies are gradually digitizing the authorities' agendas and integrating digital-driven circularity-related policies across different ministries, showing a holistic approach to policy implementation

Alignment with Market Trends: Policies follow market trends and territorial competitiveness

Monitoring and Compliance: Policies take into account the country's ability to monitor and enforce compliance, with steps including legislative changes, extension of warranty periods, and improvements to Extended Producer Responsibility (EPR) systems

legislation and fragmented awareness-raising efforts

Implementation of DIHs Interventions: There is no direct mention of the role of DIHs in several documents. While the innovation ecosystem includes institutions supporting DIHs, their specific role in policies is not clearly detailed

Assessment of Potential Negative Impacts: The assessment of potential negative impacts over the short, medium, and long-term for policy domains, instruments, and their pathways is not explicitly mentioned

Evidence of Implementation through Change Agents: While there are passionate individuals driving policy implementation within institutions, distinctive personalities or prominent change agents are not clearly visible from the outside

High-Level Commitment and Multi-Stakeholder Approaches: The Digital Strategy of Croatia until 2032 and the National Development Strategy until 2030 demonstrate high-level and long-term commitment from relevant government agencies, ensuring robust policy support

Multi-Stakeholder Collaboration: Both policies apply multi-stakeholder approaches and interagency collaboration within government, private sector, and civil society groups, fostering a collaborative environment for policy implementation

Clear Long-Term Vision: The long-term vision for Digital Innovation Hubs (DIHs) development and implementation is clearly defined, aligning with the national future outlook and EU goals for digitalization and innovation

Support for DIHs: Existing policies include interventions for DIHs, aiming to expand Digital Innovation Hubs (DIHs) and European Digital Innovation Hubs (EDIHs) across the EU, in line with the Digital Compass of the Europe's Digital Decade

Hindrance to Circular Economy Services: There are no specific mentions of policies that might hinder the implementation of DIHs towards circular economy services, indicating potential gaps in addressing legislative or regulatory barriers

Information on Circular Economy Trainings: Basic information on existing circular economy trainings in the country/region is not explicitly provided, indicating a need for more targeted educational initiatives

Integration of Policy Interventions: The integration of digital-driven circularity-related policies among different ministries and existing policies is not explicitly detailed, suggesting room for improvement in policy coherence and coordination

Assessment of Potential Negative Impacts: The assessment of potential negative impacts over the short, medium, and long-term for policy domains and instruments is not explicitly mentioned, highlighting a gap in comprehensive impact assessment

Voluntary Instruments and Legislative Framework: While voluntary instruments such as green awards, roadmaps, and eco-labelling are present, their support within a functional legislative framework is not clearly stated

SELECTED QUESTIONS IN TERMS OF QUALITY ASPECT OF POLICIES

Do existing policies have high-level and long-term commitment from relevant government agencies?

Grad Zagreb (HR)







- Are the selected policy instruments (listed in Sheet 1 Factsheet) in existing policies suited to the country's level of industrialization, environmental and socio-economic needs (e.g. financial incentives for green technologies relevant to existing industry sectors)?
- Do existing policies include a coherent strategy to accommodate the needs, opportunities and challenges associated with Small and Medium-sized Enterprises (SMEs)?
- Rather than stand-alone policy interventions, are any existing digital-driven circularity related policies already integrated amongst different ministries (e.g. Industry, environment, planning, finance) and other existing policies/instruments in the country?



Figure 3: Numbers of strategies in regards to question assessed by project partners for various regions: Do existing policies have high-level and long-term commitment from relevant government agencies?

Source: Authors

The data reveals significant differences among regions regarding the commitment of existing policies to digital-driven circular economies. Regions like Chemnitz (Saxony), Upper Austria, and Southeast (CZ) show strong high-level and long-term commitments from government agencies, indicated by numerous "Definite Yes" responses. In contrast, regions such as Eastern Slovakia, Western Transdanubia, and Grad Zagreb display more varied and uncertain commitments, with several "Likely Yes" and "Indecisive" responses. Regions like Eastern Slovenia and Liguria are marked by a mix of "Likely Yes" and "Definite Yes," reflecting moderate but growing support. These disparities highlight the need for more cohesive







and robust policy frameworks across all regions to ensure consistent progress in circular economy initiatives.



Figure 4: Numbers of strategies in regards to question assessed by project partners for various regions: Are the selected policy instruments (listed in Sheet 1 - Factsheet) in existing policies suited to the country's level of industrialization, environmental and socio-economic needs (e.g. financial incentives for green technologies relevant to existing industry sectors)?

Source: Authors

The chart depicts the assessment of how well policy instruments align with each country's level of industrialization, environmental, and socio-economic needs across various regions. Regions like Chemnitz (Saxony), Western Transdanubia, and Freiburg (Baden-Württemberg) show strong alignment, indicated by numerous "Likely Yes" and "Definite Yes" responses. This suggests that the policy instruments in these regions are well-suited to their industrial and environmental contexts. Conversely, regions like Southeast (CZ), Eastern Slovakia, and Upper Austria display a mix of "Likely No" and "Indecisive" responses, indicating potential mismatches or inadequacies in their policy instruments.









Figure 5: Numbers of strategies in regards to question assessed by project partners for various regions: Do existing policies include a coherent strategy to accommodate the needs, opportunities and challenges associated with Small and Medium-sized Enterprises (SMEs)?

Source: Authors

The chart illustrates the evaluation of how well existing policies include a coherent strategy to accommodate the needs, opportunities, and challenges associated with SMEs across various regions. Regions such as Western Transdanubia, Eastern Slovenia, and Liguria show a strong alignment with "Likely Yes" and "Definite Yes" responses, indicating that their policies effectively address the needs of SMEs. Conversely, regions like Southeast (CZ) and Upper Austria show a higher number of "Likely No" responses, suggesting that their policies may lack coherence or adequacy in supporting SMEs.









Figure 6: Numbers of strategies in regards to question assessed by project partners for various regions: Rather than stand-alone policy interventions, are any existing digital-driven circularity related policies already integrated amongst different ministries (e.g. Industry, environment, planning, finance) and other existing policies/instruments in the country?

Source: Authors

The chart illustrates how well digital-driven circularity-related policies are integrated among different ministries across various regions. Regions such as Chemnitz (Saxony) and Southeast (CZ) show a notable number of responses in the "Likely Yes" and "Definite Yes" categories, indicating a higher degree of policy integration. In contrast, regions like Upper Austria and Eastern Slovakia show significant responses in the "Likely No" and "Indecisive/Variable" categories, suggesting a lack of comprehensive policy integration. This disparity highlights the need for some regions to enhance collaboration between ministries to achieve a more cohesive approach to digital-driven circularity. In terms of this assessment, we notice Italy, Austria and Germany regions (project partners) to report the most of positive answers (answering with Definite yes or Likely yes), respectively higher number of strategies eligible for positive answers.







3. COMPARATIVE OVERVIEW OF POLICY INSTRUMENTS TOWARDS DIGITAL CIRCULARITY BASED ON THEIR CHARACTERISTICS AND FORM

This section summarizes regional viewpoints in regards to policies and strategies assessing their flexibility to make rapid adjustments (if needed), ability to achieve short-term results, integration potential with already existing systems, level of complexity, relevance to SMEs with focus on their thematic, regulatory, economic instrument-wise, information-based and voluntary aspects.

THEMATIC STRATEGIES





Figure 7: Overall Assessment of Digitally Driven Circular Economy Strategies from the Viewpoint of Thematic Strategies and Programmes and Their Aspects (assessing: Existing National Policy and Strategy, Regional/Local Programmes and Action Plans, Integration into Already Existing Policies, National Programmes and Action Plans of Digital Circular Economy for Manufacturing)

Source: Authors

Austrian and German regions consistently show strong development across all categories, indicating robust national policies, regional programmes, and integration into existing policies. Italy regions seem to excel in regional/local programmes and national programmes for manufacturing. Polish and Slovakian region seem to show lower development, particularly in regional programmes and national policies. Hungarian region has lower ratings, especially in integration into existing policies and national strategies.

REGULATORY INSTRUMENTS AND STANDARDS







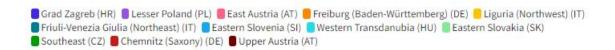




Figure 8: Overall Assessment of Digitally Driven Circular Economy from the Viewpoint of Regulatory Instruments and
Standards
Source: Authors

Germany, Austria and Slovenia region exhibit well-developed regulatory instruments and standards, especially in emission monitoring, EPR restrictions, and MPS. Italy also performs well in ICT/electronics standards. On the other hand, Poland, Hungary and Slovakia regions show areas needing improvement, particularly in sector-specific standards and EPR restrictions. This analysis highlights disparities and potential areas for development to enhance regulatory frameworks for a digitally driven circular economy across regions.

In terms of emission monitoring for manufacturing production, Germany region seems to show stronger development, while Poland and Croatia regions seem to be less developed in emission monitoring. Concerning EPR restrictions, Austria and Czech Republic have well-developed EPR restrictions, whereas Hungary and Slovakia regions' are less developed. In terms of sector-specific standards, Slovenia and Germany seem to excel in construction standards, Italy in ICT/electronics, and Austria and Czech Republic regions in textiles. Poland, Hungary, and Slovakia region consistently show lower development across these sectors according to evaluation of project partners. In regards to minimum performance standards, Austria and Slovenia region seem to have strong MPS development, while Croatia and Poland region seem to lag behind.

ECONOMIC INSTRUMENTS







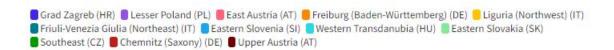




Figure 9: Overall Assessment of Digitally Driven Circular Economy from the Viewpoint of Economic Instruments
Source: Authors

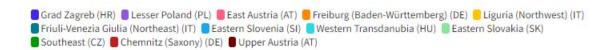
According to project partners' viewpoints, Germany, Austria and Slovenia regions exhibit well-developed economic instruments for a digitally driven circular economy, particularly in fees and charges, tax exemptions, and feed-in tariffs. Italy regions also performs well in DIHs and subsidies. Conversely, Croatia, Poland, Hungary, and Slovakia region often show lower development across various economic instruments, highlighting areas for improvement to enhance their economic support for digital circularity. In regards to fees and charges, Germany and Austria regions show strong development in implementing fees and charges, while Croatia and Slovakia seem to be less developed. Germany and Slovenia excel in tax exemptions, whereas Croatia and Slovakia are less advanced. Austria and Italy effectively use DIHs as brokers for subsidies, while Poland and Croatia are less developed. Germany and Slovenia perform well in implementing feed-in tariffs, while Poland and Hungary lag behind. Austria and Italy are strong in providing subsidies for digitally enabled circular economy initiatives, while Croatia and Slovakia regions seem to be less developed in this regard.

INFORMATION-BASED INSTRUMENTS









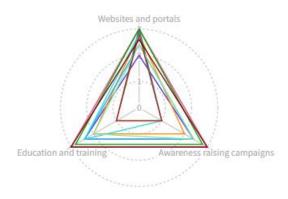


Figure 10: Overall Assessment of Digitally Driven Circular Economy from the Viewpoint of Information-Based Instruments

Source: Authors

Austria, Germany, and Slovenia regions seem to exhibit strong development in information-based instruments for a digitally driven circular economy, particularly in websites, education, and awareness campaigns. Italy and Czech Republic also perform well in specific areas. On the other hand, Croatia, Poland, and Slovakia often show lower development, highlighting the need for improvement in their information dissemination and educational efforts related to digital circularity. Austria and Slovenia have well-developed websites and portals, while Croatia and Slovakia are less developed. Germany and Czech Republic excel in providing education and training, whereas Poland and Hungary (PBN) are less developed. Austria and Italy effectively run awareness raising campaigns, while Croatia and Poland lag behind.

VOLUNTARY AGREEMENTS

COOPERATION IS CENTRAL







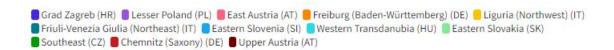




Figure 11: Overall Assessment of Digitally Driven Circular Economy from the Viewpoint of Voluntary Agreements
Source: Authors

Austria, Germany, and Slovenia regions seem to exhibit strong development in voluntary agreements for a digitally driven circular economy, particularly in reporting initiatives and certification schemes. Italy and Czech Republic also perform well in specific areas. Conversely, Poland, Croatia, and Slovakia often show lower development, highlighting the need for improvement in their voluntary agreement initiatives related to digital circularity. Austria and Slovenia show strong development in reporting initiatives, while Poland and Croatia are less developed. Czech Republic and Italy excel in public-private sector initiatives, whereas Poland and Hungary lag behind. Germany and Italy are strong in certification schemes, while Croatia and Slovakia regions show lower development.

OVERALL ASPECTS OF STRATEGIES/POLICIES TOWARDS DIGITALLY DRIVEN CIRCULAR ECONOMY

Information-based instruments; and Voluntary agreements. Each strategy is rated on a scale from 1 (more difficult, less developed) to 3 (developed).

Overall, thematic strategies, regulatory instruments, and information-based instruments generally show neutral development (rating 2) across all regions. Economic instruments and voluntary agreements exhibit more variability, with ratings ranging from 1 to 3, indicating some regions are more advanced while others are less developed. This highlights a need for focused improvement, particularly in economic instruments and voluntary agreements.

All regions (FB (AT), KPT (PL), INTEMAC (CZ), COMET (IT), SIIT (IT), TECOS (SI), mtSW (DE), HGK VZ (HR), PBN (HU), TUKE (SK)) are rated 2 (neutral development) in the area of Thematic Strategies, Programmes, and Action Plans. When it comes to Regulatory Instruments and Standards, there are consistent ratings of 2 across all regions, indicating neutral development. Economic Instruments: Ratings vary between 2 and 3, showing disparity in development levels. Information-Based Instruments: Ratings mostly 2 and 3, suggesting neutral to well-developed instruments. Voluntary Agreements: Significant variability with ratings from 1 to 3, indicating uneven development across regions.

Most regions show neutral development (rating 2) in thematic strategies, regulatory instruments, and information-based instruments. FB (AT) and SIIT (IT) frequently show higher development (rating 3) in

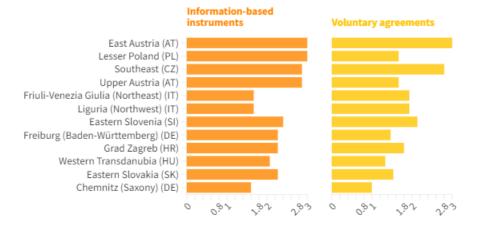






economic instruments and information-based instruments, whereas regions like PBN (HU) and TUKE (SK) often show less development (rating 1) in voluntary agreements.





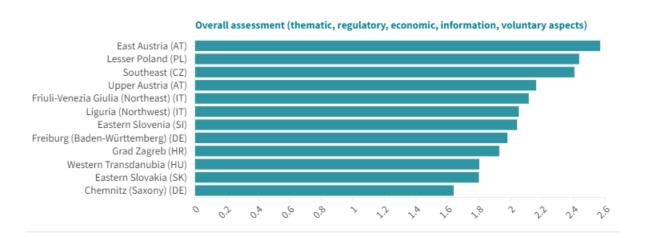


Figure 12: Assessment of development of policy strategies in the direction of digitally enabled circularity across project partners regions (from 3-developed, 2-neutral, 1-more difficult, less developed)

Source: Authors

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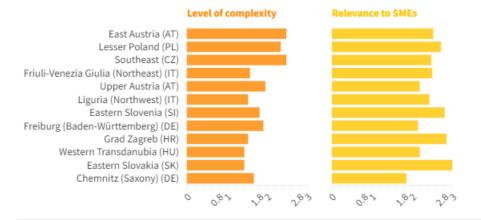






The figure 12 assesses the development of policy strategies aimed at enabling digital circularity across different project partners' regions. The evaluation is based on five key categories: Thematic strategies, programmes and action plans; Regulatory instruments and standards; Economic instruments;





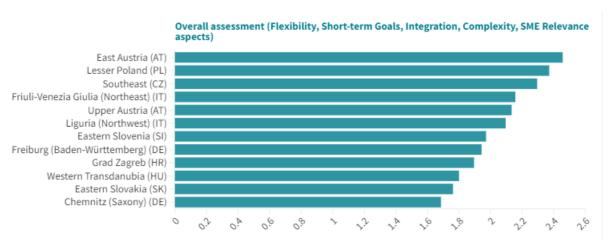


Figure 13: Assessment of various aspects of strategies, policy instruments, voluntary instruments in the area of digitally enabled circularity across project partners regions (from 3-developed, 2-neutral, 1-more difficult, less developed)

Source: Authors

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The figure assesses the development of various strategies and instruments for digitally enabled circularity across regions, rated from 1 (less developed) to 3 (developed). Generally, most regions show neutral development (rating 2) in terms of flexibility, ability to achieve short-term results, integration with existing systems, and relevance to SMEs. However, the level of complexity varies more significantly, with ratings ranging from 1 to 3, indicating that some regions find it more challenging to implement these strategies than others.

Most regions show neutral development (rating 2) in flexibility, short-term results, integration, and relevance to SMEs. Regions like FB (AT) and PBN (HU) are often more developed (rating 3), while KPT (PL) frequently shows less development (rating 1). The level of complexity is varied, with some regions like TECOS (SI) and PBN (HU) showing higher development (rating 3) and others like KPT (PL) finding it more challenging (rating 1).

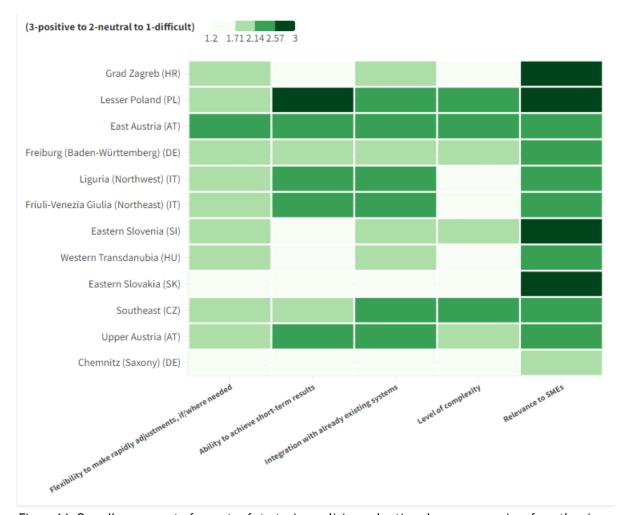


Figure 14: Overall assessment of aspects of strategies, policies and action plans across regions from the viewpoint of their responsiveness towards changes, integration and change catalysis potential

Source: Authors

This figure presents a comparative analysis of different regions based on several criteria related to the implementation of digital and circular economy strategies. The criteria assessed include flexibility to make rapid adjustments, ability to achieve short-term results, integration with already existing systems, level of complexity, and relevance to SMEs. The color intensity indicates the ease (darker green) or difficulty (lighter green) for each criterion, with 3 being positive, 2 neutral, and 1 difficult.







Overall, Grad Zagreb (HR) and Lesser Poland (PL) emerge as leading regions in terms of adaptability, short-term results, integration, and relevance to SMEs, while Chemnitz (Saxony) (DE) faces more challenges across multiple criteria. This suggests a need for tailored strategies to address specific regional challenges and leverage strengths.

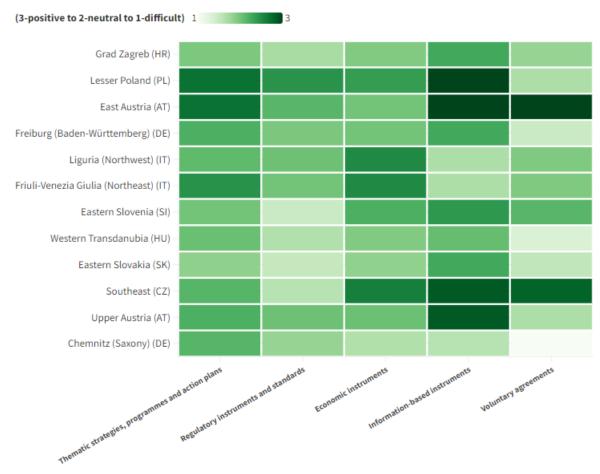


Figure 15: Overall assessment of aspects of strategies, policies and action plans across regions from the viewpoint of complexity - focus on thematic, regulatory, economic, information and also voluntary characteristics

Source: Authors

Overall, regions like Grad Zagreb, Lesser Poland, and East Austria find these policy instruments easier to implement, reflecting a higher readiness or positive perception towards policy instruments. In contrast, regions like Chemnitz (Saxony) and Southeast (CZ) face more difficulties, indicating a need for more supportive measures or adjustments to facilitate policy implementation.

E. Conclusions

This document provides a comprehensive analysis of project partners' territorial strategies, focusing on the integration and implementation of digital and circular economy principles. By consolidating insights from Sheets 1, 2, and 3, this report delivers a overview of the current status, identified strengths, and weaknesses of regional policies and strategies.

Insights from data:







- Sheet 1 Analysis Focused on Description: This section assessed the high-level vision and alignment of territorial strategies with national and EU-level goals including regional and local strategies, action plans and financial instruments options.
- Sheet 2 Analysis Focused on quality aspect of strategies/policies: This part focused on stocktaking and underpinning methodologies, gaps in detailed policy analysis, systematic approaches to policy evaluation, stakeholder engagement and collaboration in enhancing policy effectiveness.
- Sheet 3 Analysis Focused on complexity of strategies/policies: This section analysed policy intervention areas, examining the relevance and adaptability of policy instruments from the thematic, regulatory, economic, information-based and voluntary viewpoint evaluating strategies based on how adjustable they are within regional context, how beneficial they are for SMEs, how responsive they are to change etc.

Key findings:

- High-Level Vision and Alignment with National Context: Regions like Chemnitz (Saxony), Upper Austria, and Southeast (CZ) demonstrate strong high-level and long-term commitment from government agencies. In contrast, Eastern Slovakia and Western Transdanubia exhibit more uncertain and variable commitments.
- Thematic Strategies and Programmes: Austrian and German regions show strong development across all categories, with robust national policies and regional programmes. Polish and Slovakian regions show lower development, especially in regional programmes and national policies.
- Suitability of Policy Instruments: Strong alignment of policy instruments with industrial, environmental, and socio-economic needs in Chemnitz (Saxony), Western Transdanubia, and Freiburg (Baden-Württemberg). Southeast (CZ) and Upper Austria show potential mismatches in their policy instruments.
- SME-Focused Strategies: Regions such as Western Transdanubia, Eastern Slovenia, and Liguria effectively address SME needs. Southeast (CZ), Slovakia and Upper Austria may lack coherence in supporting SMEs.
- Policy Integration: Higher degree of integration among ministries observed in Chemnitz (Saxony) and Southeast (CZ). Upper Austria and Eastern Slovakia show less comprehensive policy integration.
- Regulatory Instruments and Standards: Germany, Austria, and Slovenia exhibit well-developed regulatory instruments, particularly in emission monitoring and EPR restrictions. Poland, Hungary, and Slovakia may need improvement in these areas.
- Economic Instruments: Germany, Austria, and Slovenia show strong development in economic instruments like fees, charges, and tax exemptions. Croatia, Poland, Hungary, and Slovakia seem to show lower development in economic instruments.
- Information-Based Instruments: Austria, Germany, and Slovenia demonstrate strong development in information-based instruments. Croatia, Poland, and Slovakia may need improvement in information dissemination and educational efforts.
- Voluntary Agreements: Austria, Germany, and Slovenia seem to have strong development in voluntary agreements, particularly in reporting initiatives and certification schemes. Poland, Croatia, and Slovakia may need improvement in voluntary agreement initiatives.

From geographic viewpoint:

Concerning patterns observed, Central Europe showed a balance between national and regional strategies, with some regions like Lesser Poland and Southeast (CZ) having well-defined local policies and financial instruments. Western Europe regions like Liguria and Friuli-Venezia Giulia have integrated local policies and financial instruments, but some areas like Chemnitz and Upper Austria lack local level implementation. Eastern Europe shows variability, with regions like Grad Zagreb having defined local policies and financial instruments, while others like Eastern Slovakia and Western Transdanubia have limited local engagement and rely more on national frameworks.







- Local vs. Regional Policies: Local policies often have a stronger impact on performance than regional
 instruments. Effective local governance and policies are crucial for the success of circular economy
 strategies.
- Adaptability and Contextual Fit: Policies and strategies that are well-specified and tailored to the regional context show higher effectiveness. Regions that adapt their strategies to local conditions tend to perform better.
- Regulatory and Economic Instruments: Strong regulatory frameworks and economic incentives are essential. Regions with comprehensive regulations and robust financial support mechanisms see better implementation of circular economy principles.
- SME Engagement: Effective engagement and support for SMEs are crucial. Policies that address the needs and challenges of SMEs contribute significantly to better overall performance in circular economy initiatives.
- Economic Instruments: Economic incentives like fees, charges, and tax exemptions are vital for encouraging circular economy practices. Better-performing regions often have robust economic instruments supporting digital circularity.
- Suitability of Policy Instruments: Effective policy instruments that align well with a country's industrial, environmental, and socio-economic needs are crucial. Regions with well-suited policy instruments tend to perform better in implementing circular economy strategies.

Conclusions:

Although analyses of policy strategies and instruments assessments (based on flexibility to change, integration potential, benefits to SMEs aspects and also from the viewpoints of thematic focus, voluntary potential, economic instrument potential, regulatory strength) seem to be related and correlate with assessments of how systematically these strategies align with national context (high level vision), thorough preliminary analysis, prioritizing policy intervention areas for higher effectiveness of policy, compatibility with countries' level of industrialization, environmental and socio-economic needs, monitoring of change agents in influential ministries and regional institutions, all supported by concrete action panning including responsibilities, timelines and financial/human resourcing.

Weaker linkages/relationship	Sheet 1 Analysis and the presence of more regional/local strategies and instruments	Sheet 3 Analysis - Focused on complexity of strategies/policies:
Stronger linkages/relationship	Sheet 2 Analysis - Focused on quality aspect of strategies/policies	Sheet 3 Analysis - Focused on complexity of strategies/policies:

This applies particularly in the case of better-performing regions (from the viewpoint of complexity of strategies - thematic, regulatory, economic, information-based aspects), such as East Austria, Lesser Poland, or Southeast Czechia, which all also operate with strategies and financial instruments for a digitally driven circular economy at least on the regional level (in some cases even the local level). Analyses outline that there is a stronger linkage between performance and quality, rather than complexity and quality - particularly in the case of Lesser Poland, East Austria, Italian regions (Liguria and Friuli-Venezia Giulia), Eastern Slovenia, Eastern Slovakia, and also the Grad Zagreb region. Therefore, we could hypothetically infer that the best-performing regions seem to be effective thanks to better specification and adjustment to regional contexts rather than due to a regionally







and locally focused decentralized approach, suited to specific regional and local contexts - although we notice a weak correlation here as well. Furthermore, it also seems that local policies determine performance more strongly than local instruments.

The analysis is based on the available data and the current state of policy implementation. Further research and continuous feedback from stakeholders are necessary to evaluate these strategies more thoroughly. Therefore, more information from stakeholders would be needed to provide stronger statements in regards to territorial strategies evaluation.

F. Annex section

Annex 1 - Regional and National Project Partners' Factsheets

- Policies & Instruments mapping PP1 Krakow Technology Park (Excel file)
- Policies & Instruments mapping PP2 Research Burgenland (Excel file)
- Policies & Instruments mapping PP3 PROFACTOR (Excel file)
- Policies & Instruments mapping PP4 Fraunhofer IWU (Excel file)
- Policies & Instruments mapping PP5 microTEC South West (Excel file)
- Policies & Instruments mapping PP6 SIIT Ligurian Technological District Integrated Intelligent Systems (Excel file)
- Policies & Instruments mapping PP7 COMET Scrl Friuli Venezia Giulia Mechanical Engineering Cluster (Excel file)
- Policies & Instruments mapping PP8 TECOS, Slovenian tool and die development centre (Excel file)
- Policies & Instruments mapping PP9 Pannon Business Network Association (Excel file)
- Policies & Instruments mapping PP10 Technical University of Kosice (Excel file)
- Policies & Instruments mapping PP11 Internac Solutions (Excel file)
- Policies & Instruments mapping PP12 Croatian Chamber of Economy Varaždin County Chamber (Excel file)