Interreg CENTRAL EUROPE

Co-funded by the European Union

SMART CIRCUIT

Design Report on Transnational Solution for The Factory, with 4 Flagship Solution Models

D.3.4.2 – Report for A3.4

Final version

03 2026

Document control

Document Summary	
Project Number	CE0100007
Project Title	SMART CIRCUIT
Work Package	WP3 UPGRADE! Enhance CE Production Value Chains w/ Digital/Technology-Driven Circular Service Solutions
Activity	A3.4 EXPAND! Circular Industry Factory Futures Solutions to Upgrade Production Chains & Capitalize Benefits in Central Europe
Deliverable	D3.4.2 Design Report on Transnational Solution for The Factory, w/4 Flagship Solution Models
Deliverable Responsible (if applicable)	PP2/FB
Deliverable Reviewer (if applicable)	LP1/KPT
Deliverable Due Date	Period 6

Dissemination Level		
PU	Public	
PP	Restricted to other programme participants	
RE	Restricted to a group specified by the consortium	
CO	Confidential, only for members of the consortium	CO

Document History							
Version	Type	Status (explanation, internal re status internal or public	Definition (explanation, internal)	Author(s), PP name	Revised by Partners	Date	Deadline description
D0.1	Draft version 1	internal	Outline drafted	MCR	LP1/KPT, PP2/FB, PP8/TECOS	15.01.2026	First draft of the full deliverable reviewed by the WP3 core group
D0.2	Draft version 2	internal	Final draft ready to be sent to the consortium	MCR	All PPs	17.02.2026	Final draft with the integrated feedback from WP3 core group
Final	Final version	internal	Final version	PP2/FB	All PPs	20.03.2026	Final version of the deliverable

Contents

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).

WP3 aims to develop and operationalize the **Circular Industry Futures Factory (FACTORY)** – a hands-on support model enabling manufacturing enterprises to adopt digitally and technologically driven circular economy solutions. WP3 builds on priorities and needs identified through direct engagement with 60 manufacturing SMEs (5 per partner), structured interviews, and Task Force consultations.

The FACTORY delivers pilot-tested service portfolios aligned to the four TF value chains. These services are co-developed, regionally tested, and validated in the pilot factories under A3.3. The outcomes provide the foundation for long-term strategic implementation:

- Development of sector-specific and cross-sectoral circular economy service portfolios.
- Enhanced capacity of DIHs and regional stakeholders.
- Preparation of the **Circular Industry Futures Strategy/Action Plan 2030**, setting actionable next steps and providing a roadmap to bridge current gaps in circular adoption, thus enabling a competitive, low-waste, digitally empowered CE manufacturing sector.

In **Activity A3.4**, project partners use lessons and tangible outcomes of four transnational pilot tests (DT3.3.1 & DT3.3.2) to create **one Transnational Flagship Solution per Task Force** (4 in total). These Flagship Solutions are:

- Derived from the aligned Service Portfolios.
- Aimed at delivering sustainable and replicable industry support models.
- Promoted and disseminated across Central Europe.

Each Flagship leverages finance mechanisms (e.g., Horizon Europe, Digital Europe Programme, ERDF) and engages additional territories through Memorandum of Understanding (DT2.1.3).

2. Scope of Document and Summary

This report provides and overview of the Transnational Solution for the FACTORY, with 4 Flagship Solution Models. Thus, this report provides the PPs the following benefits:

- Provides an overview of the process for developing the solution with four Flagship Solution Models.
- Showcases the interlinks between the different project activities (challenges identified in A3.2; A3.1 service portfolios tested in A3.3 pilots; and the D3.4 solution with four Flagship Solution Models, ensuring the uptake, transfer and long-term sustainability of the FACTORY results).

- Illustrates the four Flagship Solution Models with clear pathways for their further expansion and use.

Thus, this report provides an overview & interlinks of the different activities in WP3 and their exploitation pathways in the form of a transnational solution, comprising four flagship solution models:

- **Textile Flagship Solution Model:** Consists of a roadmap for BSOs and other organizations to support textile SMEs in implementing circularity through circularity-driven workshops developed in one of the pilots, as well as through a transnational Flagship project in which two PPs from the Smart Circuit consortium participate. Finally, to ensure the anchoring of textile service portfolios and other tools developed within the project, LoCs will be signed by PPs and ASPs.
- **Construction Flagship Solution Model:** Consists of a roadmap for BSOs and other organizations to support construction SMEs in implementing circularity through digital tools that embed sustainability and ensure process efficiency, digital monitoring and communication of energy performance, and LCA as a means to reduce waste and increase circular material use, developed through PP pilots, as well as through a transnational Flagship project involving one PP from the consortium and one extended region, and one individual Flagship outreach to new organizations. Finally, to ensure the anchoring of construction service portfolios and other tools developed within the project, LoCs will be signed by PPs and ASPs.
- **ICT/Electronics Flagship Solution Model:** Consists of a roadmap for BSOs and other organizations to support ICT/electronics SMEs in implementing circularity through SME capacity building via workshops, technology matchmaking between SMEs and innovation providers, assistance to companies in testing and implementing advanced solutions, and support in sustainability communication and website usability, developed through PP pilots, a transnational flagship project involving two PPs from the consortium, and through one individual Flagship outreach to new organizations. Finally, to ensure the anchoring of ICT/Electronics service portfolios and other tools developed within the project, LoCs will be signed by PPs and ASPs.

  Cross-sectoral Flagship Solution Model: Consists of a roadmap for BSOs and other organizations to support SMEs across different manufacturing sectors in implementing circularity by connecting different individual EU and regional projects of PPs that are either ongoing or pending approval. The aim is to continue collaboration within the consortium through annual meetings, where PPs exchange knowledge and information from projects capitalizing on or complementing Smart Circuit, and jointly develop ideas and partnerships for new projects in the next funding period. PPs will sign LoCs to commit to participating in these meetings and to anchoring and integrating selected cross-sectoral service portfolios together with ASPs.

3. Audience

This document is directed at all project partnership members, because all members of the partnership should participate in WP3 ideation and implementation, more specifically A3.4 through this report. 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

PP2/FB created this report, 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 PP2/FB) in a timely manner (within 8 working days according to the Rules of Procedure). 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 and Lead Partner (in this case PP8/TECOS & 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.

B. Introduction

The goal of this document is to provide an overview of the A3.4 process, resulting in the Transnational Solution for the FACTORY, with four Flagship Solution Models. This includes creating interlinks between the different WP3 activities and combining the key takeaways into a unique solution model that can be further updated and transferred. It should be remembered that all activities in WP3 are in direct link to activities in WP1 and WP2, this interconnection should be considered when completing all objectives.

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).

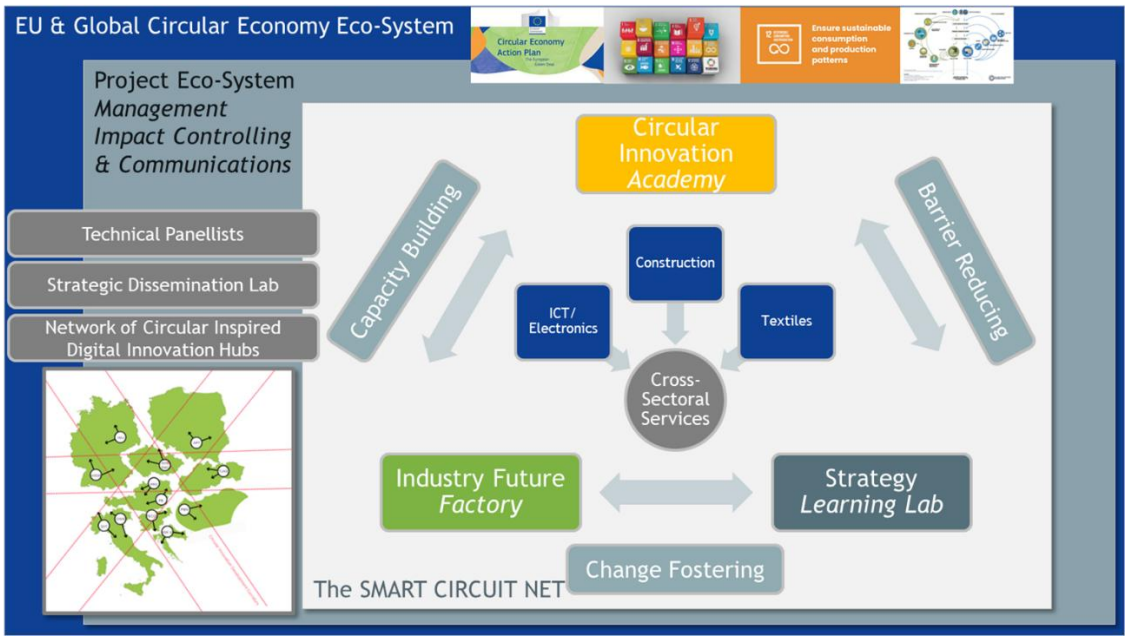


Figure 1 SMART CIRCUIT Eco-System Overview (source: Project Generated, 2023)

The project's core hypothesis is that Digital Innovation Hubs are uniquely positioned to facilitate a more circular and regenerative future. The legal entities which make up the DIHs have knowledge, skills and access to technology (as services & products) which make them absolutely vital to bringing in a twin-transition and championing digitally-driven circularity.

2. Background of the FACTORY

The Circular Industry Factory (FACTORY) is delivered through a jointly implemented transnational system (A3.3) consisting of 4 co-created Transnational Pilots to support CE Manufacturing Eco-System enterprises (D3.2.3) engage with the value-creation opportunities of digital-technology driven Circular Economy. The method helps key players adopt circular principles and creates an operational support framework cascading from the CIRCUIT (A3.1). The main sectoral focuses are on Construction, Textile, Electronics & cross-sectoral circular production/tech value-chains.

The purpose of the FACTORY is to:

1. A3.2 BUILD! sets a capacity baseline and engagement pool with 60 enterprises (5/PP) from the CE manufacturing value-chains. This pool is interviewed on challenges, needs and perceptions regarding circular economy and industry future (D3.2.2). Circular capacity of enterprises is measured. Outcomes are mapped to establish circular service clusters, informing the transnational pilot & solutions. Led by 4 TFs (A3.1), Action Plans are formed as a strategic planning activity for the pilot activities in A3.3 and linked to A1.1 insights.
2. A3.3 TEST! puts A3.2 plan into action and champion one transnational system of 4 jointly designed and tested pilots to promote uptake of circularity in production chain (PPs work in 2 test pilots, 1 mandatory for all and 1 chosen sector). Pilots upgrade classic DIH services and promote transfer of knowledge and technology between territories.
3. A3.4 EXPAND! uses lessons and tangible outcomes of 4 transnational Pilot tests (D3.3.1&2) and creates 1 Transnational Flagship Solution for delivering sustainable support to Industry and promoting widespread dissemination and capitalization of services towards long-term upgrade of CE manufacturing value-chains.

WP3 activities directly linked to one key project result:

- Circular Industry Futures Factory Solution (FACTORY, Result 4) is linked to OT3.1 (Pilot) and OT3.2 (Solution) and is vertically integrated into the work plan in A3.2, A3.3 and A3.4 (and evaluated in A3.5). The FACTORY aims to deliver enterprises the chance to experience the value-creation opportunities of digital/tech.-driven circular economy in manufacturing. In that way, it helps key industry in need of 'closing-loops' (high resource use and high potential for circularity) and accesses critical market & policy support to navigate the adoption and implementation of technologies. The FACTORY uses services, experience and network of the CIRCUIT to test, implement and expand a transnational approach delivering service-solution support to industry players and close loops in 3 key sectoral value-chains: construction, textile and electronics and fostering cross-sectoral services to production (in line with the EU Circular Economy Action Plan-CEAP), to allow wider adoption and consolidated transnational technology portfolios for circular technology/production value-chain.

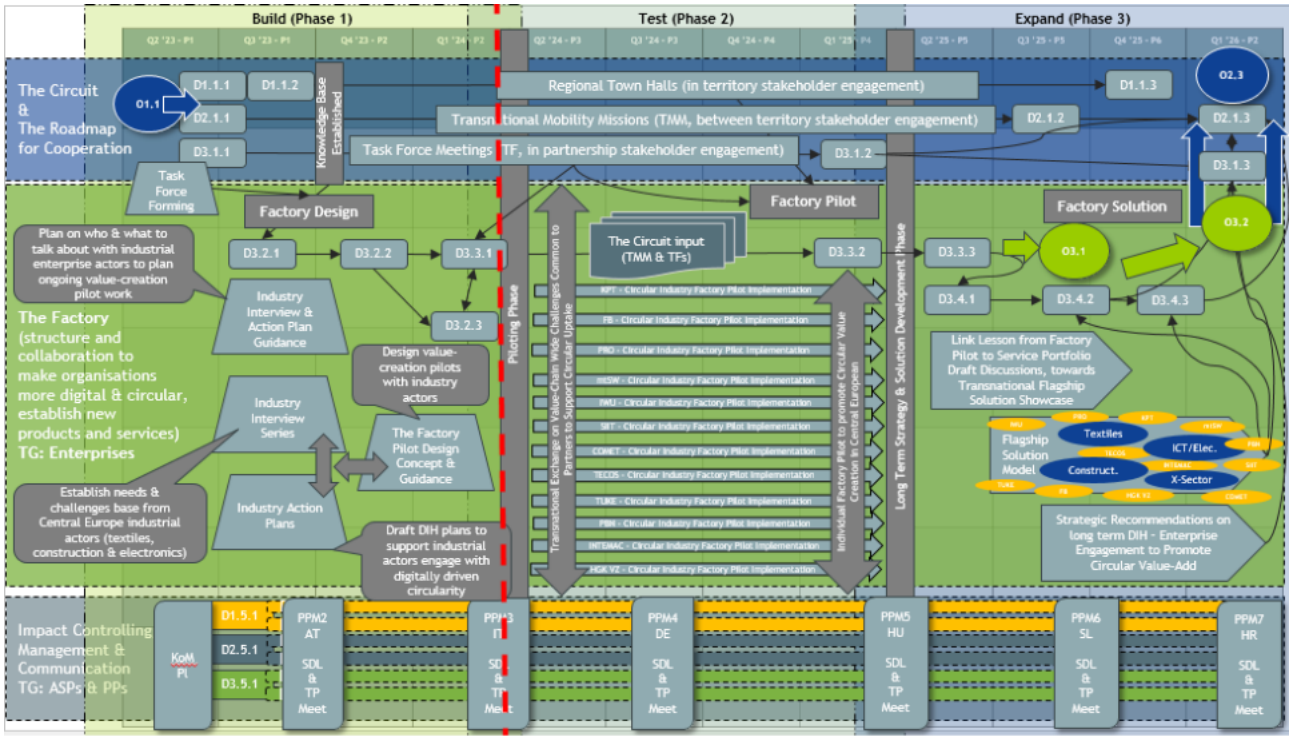


Figure 2 Plan-on-a-Page for FACTORY (source: Project Generated, 2023)

WP3 outputs are the following ones:

- The Circular Industry Factory (FACTORY) "See & Feel" Pilot, 1 Transnational System Designed and Implemented to Help Enterprises Take-Up Digital /Tech-Driven Circular Solutions and Services
- The Circular Industry Factory (FACTORY) Solution: Service Portfolios & Flagship Projects for Wider Spread Value-Creation using Digital/Technology Driven Circular Economy

3. Contribution from Activity Description and Cross Project Knowledge

The FACTORY Work Package (WP) is led by PP8/TECOS and aims to build, test, implement and expand long-term sustainable systems to upgrade CE production chains by enabling enterprises to 'feel & touch' the benefits of digital/technology-driven circular economy services & experiment with innovation within circularity to add value, achieve aims and overcome functional challenges. A3.2, sets a capacity baseline & engagement pool with 60 enterprises (5/PP) from the CE manufacturing value-chains. This pool is interviewed (baseline audit) on challenges, needs & perceptions regarding circular economy & industry future (D3.2.2). Circular capacity of enterprises is measured, outcomes are mapped to establish circular service clusters, informing the transnational pilot and solutions. Led by 4 TFs (A3.1), action plans are formed, as a strategic planning activity for the pilot activities in A3.3 and linked to A1.1 insights. Based on the key takeaways form the piloting phase, the service portfolios (A3.1) are updated and 4 Flagship Solution Models (A3.4) developed to ensure long-term sustainability of the project's results.

4. Contribution from Deliverable Description

D3.4.1 Circular Industry Factory Flagship Solution Guidance / PP8/TECOS

1 guidance document, building on DT3.2 & 3.3 lessons & tangible benefits, + TP & stakeholder feedback & extended network development of Service Portfolios (AT3.1), on the technical requirements & partnership & submission requirements on the Transnational Flagship Solution Showcase (1/ TF, 4 Total).

D3.4.2 1 Design Report on Transnational Solution for The Factory, w/4 Flagship Solution Models / PP2/ FB

1 report on the Transnat. Solution, w/ evidenced next steps to promote Solution Implementation (1/Task Force), submitted/signed LOC + next steps bringing Flagship Solution Model to the market, to promote system-wide VC production upgrades toward more sustainable operation. Completes O3.2.

D3.4.3 Digital Marketing Campaign for Flagship Service Solutions (1 Transnational System, 4 Units) /PP9/PBN

1 digital marketing campaign on system of industry solutions. 4 spotlights & 1 transnational synopses on value-creation embedded in the 4 Portfolios & showing opportunities to change wider behaviour & adoption of circularity in production value-chains across the CE/EU through Flagship Models.

5. Key definition and Concepts

SMART CIRCUIT NET: The branded name of the connected network of Digital Innovation Hubs in SMART CIRCUIT, the CIRCUIT for short. The CIRCUIT consists initially of 12 DIHS (1/PP). The vision is to expand the CIRCUIT to minimum 28 DIHS (12PP + 16 additional, 1/PP + 5/KPT), within CENTRAL EUROPE and other macro-regional strategy areas (Danube, Alpine, Baltic Sea, Adriatic & Ionian Regions), who commit to work on the vision & mission of the SMART CIRCUIT NET, plus engage in activities (CIA, STRATLAB) which deliver the Transnational Service Portfolios for the FACTORY beyond the duration of the project.

Circular Innovation Academy (CIA): The CIA builds capacity and common language within and between the transnational DIH eco-system. The principle is that individuals in the CIRCUIT gain knowledge about supporting adoption of circular policy and solutions to maximize shared value and translate this value to enterprises and other eco-system stakeholders.

Circular Innovation Development Corridor (CIDC): The development corridors are links between selected DIHs who commit to work together to deliver services in a transnational context associated to the topic of digitally-driven circularity.

Circular Value Translation Engineers (CIVES): Is the name of the students who are learning and exchanging in the CIA. The group starts at a size of 24 individuals, 2 representatives per Partner DIH eco-system. The group will then expand to over 120 individuals, coming from other DIHs and other BSO communities interested in learning, sharing and exchanging on this topic.

C. Methodology

This section provides an overview of the necessary steps for developing the Transnational Solution for the FACTORY, with four Flagship Solution Models.

The section is divided into two parts:

1. **Part One** – Outlines the interlinks between different activities and deliverables resulting in the FACTORY Solution.
2. **Part Two** – Showcases the process of developing the 4 Flagship Solution Models.
3. **Part Three** – Showcases four Transnational Solution Models
4. **Part Four** - Demonstrates how the Project Partners aim to ensure long-term sustainability of the Transnational Solution via the LoCs.

1. Part one – Links with other Deliverables

Before providing more details on the Transnational Solution for the FACTORY, it is important to understand the links between the project's different stages and how the Solution was developed based on key findings from various activities to enable digital/technology-driven circularity.

1.1. Interviews with key stakeholders (A3.2)

The process began with identifying the challenges and needs of CE manufacturing SMEs with regard to digitally driven circularity, as part of Activity 3.2 (D3.2.2). More than 60 SMEs from nine CE countries were interviewed in order to understand their level of circular maturity and the digital tools they use or are aware of that they can leverage to implement circular practices.

The analysis has been conducted at cross-sectoral and sectoral levels (textile, construction and electronics), showcasing how challenges in the circular transition change (or become more or less relevant) based on the sector. The cross-sectoral challenges include:

1. **Regulatory Environment and Compliance** - The primary challenge arises from regulatory changes, as companies may lack awareness of these changes, struggle to adapt promptly, or begin adaptation efforts too late. Moreover, the evolving nature of regulations introduces uncertainty, compounding the challenges companies face.
2. **Market Dynamics** - The dynamic economy and global events pose various challenges for companies, including fluctuating raw material prices, differing quality standards, market readiness for sustainable practices, and price inflation and fluctuation.
3. **Technology Dynamics, Adoption and Risks** - The development of new technologies presents several challenges for companies. Rapid changes often lead to technological obsolescence, necessitating quick adaptation and flexibility. Additionally, the increased reliance on technologies raises cybersecurity concerns and questions about data safety and protection.
4. **Financial Challenges** - Companies face various financial challenges, including the high costs associated with implementing circular practices, the capital required for initial investments, and the need to adapt to rapid market changes.
5. **Customers Awareness and Preferences** - Main challenges include customer education, meeting customer expectations, and responding to market fluctuations and demands.

6. **Sustainable Supply-Chain Management** - Potential challenges include supply chain disruptions, dependency risks, and logistical operation challenges, which are further intensified by global logistics uncertainty.
7. **Sustainable Resource Management** - Potential challenges include achieving resource efficiency, navigating the trade-off between sustainability and cost-effectiveness, minimizing environmental impact, and ensuring the sustainable sourcing and collection of materials.
8. **Lack of Qualified Workforce and Training** - Various factors contribute to the challenges companies face in acquiring a qualified workforce. These include lack of digital skills, limited understanding of circularity, resistance to change, and insufficient training and education for employees.
9. **Environmental Challenges** - The main challenges encompass climate change impacts, compliance with environmental regulations, and efforts to minimize negative environmental impact.
10. **Competitiveness** - Maintaining and achieving competitiveness, while implementing sustainable practices, presents a significant challenge in today's fast-changing environment.
11. **Lack of Cooperation** - Companies frequently face difficulties in establishing collaborations with stakeholders, particularly when participating in EU-funded projects. These difficulties often come from the complexity and duration of the application process.

Companies have also identified emerging trends in the market that could change the current business practices, creating potential for change:

1. **Technology advancements** - Companies have identified several key trends, including digital transformation, integration of AI, machine learning, smart manufacturing initiatives, utilization of IoT for product tracking and digital monitoring of consumption patterns.
2. **Circular Practices and Innovation** - Waste reduction, closing the loop, supply chain traceability, material sourcing and collection, circular design, circular products etc.
3. **Regulatory Compliance and Standards** - Compliance with regulations and standards such as ESG, legislations concerning food and energy usage, carbon taxation, green product standards, Green Claims Directive, EPR Regulations etc.
4. **Customer Behaviour and Expectations** - Current trends indicate a shift in customer mindsets, with a growing demand for inexpensive products, coupled with an increasing importance placed on health-conscious lifestyles. Moreover, customers are setting higher standards and requirements for products and services.
5. **Environmental Initiatives** - Sustainable initiatives encompass various actions aimed at promoting environmental responsibility and ethical practices. These include enhancing brand recognition, obtaining certifications, and calculating carbon footprints.
6. **Financial Incentives** - These include tax benefits, subsidies for research and development (R&D), grants for implementing Circular Economy (CircE) initiatives, tax incentives for reuse, and carbon dioxide (CO2) taxes. Such initiatives provide incentives for companies to adopt environmentally friendly practices and contribute to a greener economy.

1.2. IT Action Plan (A3.2)

All these findings have been compiled in D3.2.3, which focused on the specifics of each sector and established a baseline for developing the A3.1 Service Portfolios and A3.3 Pilots. Based on insights from companies regarding the biggest challenges, trends and opportunities in the circular transition, a decision-making matrix has been created, providing technologies and solutions that could help companies address challenges, follow emerging market trends and use digital opportunities to foster circularity and new business opportunities.

Prior to the creation of the Matrix, the problem (challenge) assessment and the technology assessment has been conducted to:

- Understand which technologies the consortium should invest in, as they are the ones most relevant to businesses and aligned with market trends and resulting opportunities. These technologies have been divided into 3 levels of priority (high, medium, and low).
- Understand which problems (challenges) the consortium should invest in, as they are the ones most relevant to businesses and aligned with market trends and resulting opportunities. These problems have been divided into 3 levels of priority (high, medium, and low).

The table below showcases the ranking (high, medium and low) of identified problems and technologies:

HIGH PRIORITY

ID PROBLEM	PROBLEM	ID TECH	TECHNOLOGY
P2	Not-qualified workforce	T11	Digital Twins
P3	Sustainable Supply Chain Management	T12	Data Analytics Platforms and tools
P4	Technology Adoption and Integration	T5	Life Cycle Assessment (LCA) tools
P6	Resource Efficiency and Optimization / Waste Management	T7	Blockchain (Traceability platforms)
P9	Regulatory compliance and Standards	T1	Machine Learning (ML) and Artificial Intelligence (AI)

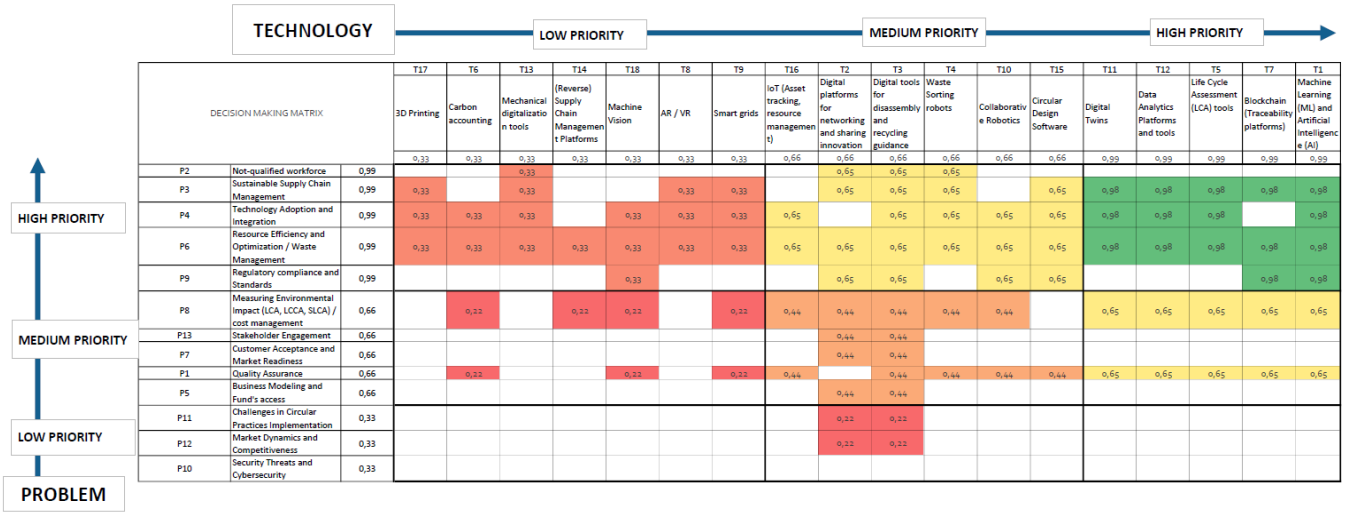
MEDIUM PRIORITY

ID PROBLEM	PROBLEM	ID TECH	TECHNOLOGY
P8	Measuring Environmental Impact (LCA, LCCA, SLCA) / cost management	T16	IoT (Asset tracking, resource management)
P13	Stakeholder Engagement	T2	Digital platforms for networking and sharing innovation
P7	Customer Acceptance and Market Readiness	T3	Digital tools for disassembly and recycling guidance
P1	Quality Assurance	T4	Waste Sorting robots
P5	Business Modeling and Fund's access	T10	Collaborative Robotics
		T15	Circular Design Software

LOW PRIORITY

ID PROBLEM	PROBLEM	ID TECH	TECHNOLOGY
P11	Challenges in Circular Practices Implementation	T17	3D Printing
P12	Market Dynamics and Competitiveness	T6	Carbon accounting
P10	Security Threats and Cybersecurity	T13	Mechanical digitalization tools
		T14	(Reverse) Supply Chain Management Platforms
		T18	Machine Vision

Figure 5 shows the decision-making matrix, which provides an overview of the priority problems and the technologies that can address them at the level of the whole consortium (cross-sectoral):



DECISION MAKING MATRIX			T17	T6	T13	T14	T18	T8	T9	T16	T2	T3	T4	T10	T15	T11	T12	T5	T7	T1
			3D Printing	Carbon accounting	Mechanical digitalization tools	(Reverse) Supply Chain Management Platforms	Machine Vision	AR / VR	Smart grids	IoT (Asset tracking, resource management)	Digital platforms for networking and sharing innovation	Digital tools for disassembly and recycling guidance	Waste Sorting robots	Collaborative Robotics	Circular Design Software	Digital Twins	Data Analytics Platforms and tools	Life Cycle Assessment (LCA) tools	Blockchain (Traceability platforms)	Machine Learning (ML) and Artificial intelligence (AI)
			0,33	0,33	0,33	0,33	0,33	0,33	0,33	0,66	0,66	0,66	0,66	0,66	0,66	0,99	0,99	0,99	0,99	0,99
P2	Not-qualified workforce	0,99			0,33						0,65	0,65	0,65							
P3	Sustainable Supply Chain Management	0,99	0,33		0,33			0,33	0,33		0,65	0,65	0,65		0,65	0,98	0,98	0,98	0,98	0,98
P4	Technology Adoption and Integration	0,99	0,33	0,33	0,33		0,33	0,33	0,33	0,65		0,65	0,65	0,65	0,65	0,98	0,98	0,98		0,98
P6	Resource Efficiency and Optimization / Waste Management	0,99	0,33	0,33	0,33	0,33	0,33	0,33	0,33	0,65	0,65	0,65	0,65	0,65	0,65	0,98	0,98	0,98	0,98	0,98
P9	Regulatory compliance and Standards	0,99					0,33				0,65	0,65		0,65	0,65				0,98	0,98
P8	Measuring Environmental Impact (LCA, LCCA, SLCA) / cost management	0,66		0,22		0,22	0,22		0,22	0,44	0,44	0,44	0,44	0,44		0,65	0,65	0,65	0,65	0,65
P13	Stakeholder Engagement	0,66									0,44	0,44								
P7	Customer Acceptance and Market Readiness	0,66									0,44	0,44								
P1	Quality Assurance	0,66		0,22			0,22		0,22	0,44		0,44	0,44	0,44	0,44	0,65	0,65	0,65	0,65	0,65
P5	Business Modeling and Fund's access	0,66									0,44	0,44								
P11	Challenges in Circular Practices Implementation	0,33									0,22	0,22								
P12	Market Dynamics and Competitiveness	0,33									0,22	0,22								
P10	Security Threats and Cybersecurity	0,33																		

Figure 3 Final Decision-Making Matrix (source: D3.2.3 IT Action Plan, 2024)

The matrix shown above represents the decision-making framework of the SMART CIRCUIT consortium. Thanks to this matrix, concrete decisions can be made regarding the relevance of the problem and the relevance of the technology in relation to market trends. Below is an explanation of the matrix:

- **Green Squares (High Problem Priority x High Technology Priority):** These combinations are the most critical. They indicate urgent problems that can be effectively addressed by the most important technologies. It's where both the problem's priority and the technology's capability to solve it are rated the highest.
- **Yellow Squares (High Problem Priority x Medium/Low Technology Priority or Low Problem Priority x High Technology Priority):** These squares are of moderate importance, highlighting either a high-priority problem that may not be optimally addressed by the available technology, or a less urgent problem that could be well-managed by a highly prioritized technology.
- **Red Squares (Low Problem Priority x Low/Medium Technology Priority):** These combinations are less critical, suggesting that they represent lower-priority problems paired with technologies that are not considered highly important. They are the least urgent and can be allocated resources after the more critical issues are addressed.

As noted above, each sector faces distinct challenges, or prioritizes challenges differently, due to its specific characteristics and technologies. This is why the matrix has also been developed at the sectoral level.

Figure 6 shows the decision-making matrix, which provides an overview of the priority problems and the technologies for the textile sector:

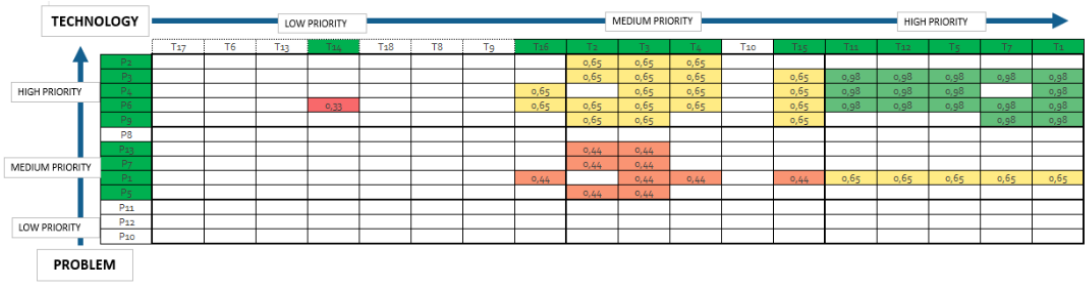


Figure 4 Final Decision-Making Matrix for the Textile Sector (source: D3.2.3 IT Action Plan, 2024)

Figure 7 shows the decision-making matrix, which provides an overview of the priority problems and the technologies for the ICT/electronics sector:

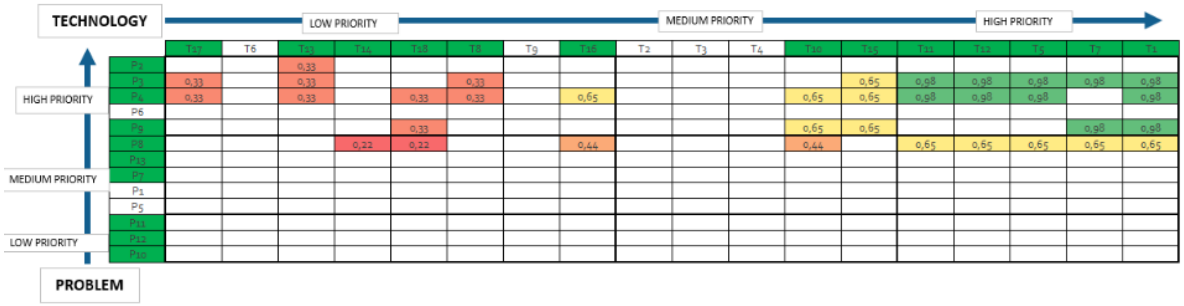


Figure 5 Final Decision-Making Matrix for the ICT/Electronics Sector (source: D3.2.3 IT Action Plan, 2024)

Figure 8 shows the decision-making matrix, which provides an overview of the priority problems and the technologies for the construction sector:

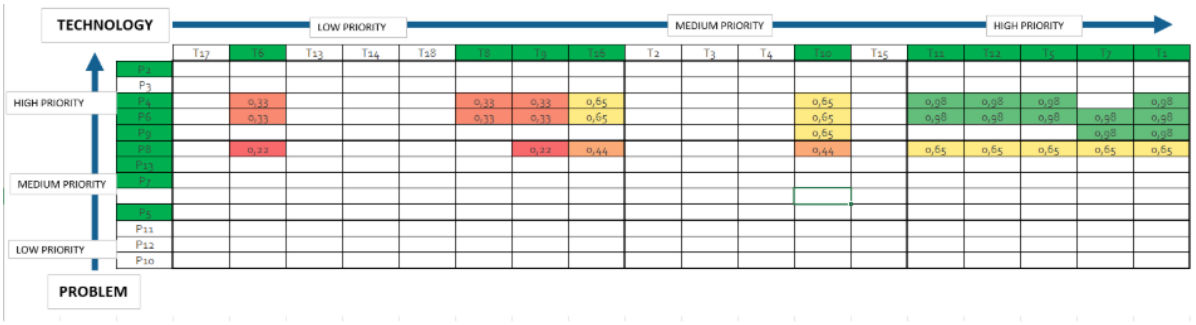


Figure 6 Final Decision-Making Matrix for the Construction Sector (source: D3.2.3 IT Action Plan, 2024)

1.3. Service Portfolios (A3.1) & FACTORY Pilots (A3.3)

Based on the key findings from stakeholder interviews and the decision-making matrix indicating the most suitable technology for overcoming identified challenges, the four Task Forces (Construction, Textiles, ICT/Electronics, and Cross-sectoral) have developed unique service portfolios to help companies implement circular practices and drive forward using advanced technological solutions.

These services were validated through the FACTORY pilot activities, which included both sector-specific (1/PP) and cross-sectoral (all PPs) initiatives, covering four value chains: Textile, Construction, ICT/Electronics, and Cross-sectoral, as presented in Table 1. During the piloting activities, the PPs tested their services with companies and received valuable feedback on necessary improvements. The PPs completed an interim evaluation, reflecting on their piloting activities, and had the opportunity to make any necessary updates and adjustments. At the end of the piloting phase, the PPs delivered reports which were summarised in D3.3.3. These reports outline the key lessons learned from the piloting activities and provide the baseline for updating the service portfolios and making necessary improvements based on real-life experience with companies. The services have been updated and summarised in the final Service Portfolio (D3.1.3).

In the D3.3.3, the clear links between the tested services and the pilots have been provided for:

ICT/Electronics Portfolio:

Table 1. Link between ICT TF Service Portfolio and Pilots (source: D3.3.3 Report, 2025)

Vertical	Objective / Value Proposition	Related Pilots	Pilot description
1. Enhancing Resource Efficiency through Technology Integration	Reduce material/energy waste by automating repeatable tasks and tightening feedback loops on the shop floor.	PBN – Automated Material Refill System	A humanoid (Poppy) plus a MiR100 monitored line status, detected shortages, issued alerts, and reinforced recycling use. The setup reduced downtime and improved material stewardship, proving that human-robot collaboration can support circularity in electronics production.

	Embed circular design early to cut scrap, extend life, and enable repair/refurb before tooling.	TECOS – Fast Prototyping and Development	Rapid CAD-print-fit-test iterations applied modularity, repairability, and traceability from day one. Recycled/bio-based filaments were validated; standardized connectors and labeled sub-assemblies supported future upgrade and recovery; documentation lifted first-pass yield and setup efficiency.
	Shorten test cycles and reduce rework through automation and operator upskilling.	PROFACTOR – Skills and Training for Automated Testing of Electronic Boards	A cobot-based demonstrator automated PCB testing and sorting. Structured training improved safe operation, troubleshooting, and workflow integration; pre/post assessments evidenced higher competence and readiness, lowering defect risk and waste.
2. Advancing Operational Proficiency with Digital Twin Technologies	Prepare DT-readiness via standardized data, traceability, and iteration loops (foundation for later simulation).	TECOS – Fast Prototyping & Circular Design	While no full digital twin was deployed in this pilot set, TECOS established DT enablers (clean BoMs, revision control, traceability, testable prototypes), creating a practical pathway for future lifecycle simulation and predictive maintenance.
3. Exploration and Utilization of Advanced Technologies	Trial emerging tech (humanoids, mobile robots) to unlock new circular workflows.	PBN – Automated Material Refill System	Demonstrated how humanoid perception + mobile logistics can close material loops, with clear lessons on current limits (payload, heat) and next-step improvements.
	Use biometric UX research to improve authenticity and impact of sustainability messaging.	FB – Website Communication Analysis	Eye-tracking and emotional analytics identified what users notice, trust, and ignore on sustainability pages, yielding concrete design changes to boost attention, trust, and conversion.
	Accelerate the adoption of advanced automation in PCB testing.	PROFACTOR – Skills and Training for Automated Testing of Electronic Boards	Cobot testing showcased accessible automation for SMEs, coupling tech trial with repeatable training and evaluation.
4. Fostering Dynamic Strategic Alliances for Service Innovation	Broker challenges and solutions to de-risk adoption and speed implementation.	COMET – Tech Challenges	A structured challenge–solution process matched SMEs with ICT providers, resulting in agreements and first deployments (e.g., AI/IoT predictive maintenance, vision recognition), while highlighting the importance of post-match facilitation.
	Lower the barrier to research collaboration and funding alignment.	SIIT – University-Industry Collaboration	A negotiation-podcast and Horizon Europe matchmaking tool helped SMEs and PhD groups find common ground and opportunities, turning knowledge transfer into an approachable, repeatable service.
5. Navigating Risks in ICT Adoption and Integration	Systematically assess circular maturity and prioritize 6R actions with measurable indicators.	KPT – 6R Strategy Design	Internal and external workshops built 6R capability, delivered structured diagnostics, and launched company road-mapping; indicators were approved at organizational level to steer adoption.
	Build reporting literacy and governance for climate-neutrality pathways.	MTSW – Learning Network Climate Neutrality	A focused CSRD/VSME workshop with readiness checks clarified data gaps, thresholds, and confidentiality; SMEs left with concrete next steps and new business links.
6. Promoting Sustainable Consumption and Product Longevity	Increase user trust and retention by communicating credible, product-level sustainability.	FB - Website Communication Analysis	Findings guided clearer, more persuasive online sustainability narratives, addressing low trust and helping firms present repair, take-back, and recyclability options more effectively.
	Design products for disassembly, upgrade, and second life.	TECOS – Fast Prototyping and Development	Modular enclosures, standardized fasteners/connectors, and labeled sub-assemblies enabled repair/refurb routes; early prototype evidence accelerated buy-in for longevity strategies.

Textile Portfolio:

Table 2 Link between Textile Service Portfolio and Pilots (source: D3.3.3 Report, 2025)

Vertical	Objective / Value proposition	Related Pilots	Pilot description
1.SMART MATERIALS (technicalities included in the textile)	Integrating technical functionalities (e.g., thermoregulation, self-cleaning, antibacterial coatings) into textiles using smart materials.		
2.Consumer Behaviour	Encouraging sustainable consumption habits, such as buying less, choosing quality, and participating in repair or resale ecosystems.	IWU – Design-driven Workshop Concept	IWU's pilot promotes sustainable behavior change by engaging SMEs in co-creative workshops focused on small, realistic steps toward circularity.

3.Extending Lifespan of Textile-Goods	Empowers consumers as active contributors to the circular economy by reducing over-consumption and waste generation.	IWU - Design-driven Workshop Concept	The design-driven approach encourages SMEs to imagine and implement longer product lifecycles through collaborative ideation and scenario-based design.
4.Waste Management of Textile	Developing systems for sorting, recycling, and upcycling of post-consumer and industrial textile waste.	IWU - Design-driven Workshop Concept	By including plastics and textiles, the pilot touches upon cross-sectoral recycling and upcycling opportunities, offering SMEs practical entry points to circularity.
5.Production where Textile is involved	Enables closed loop systems where textiles are repurposed, minimizing landfill and supporting resource recovery.	IWU - Design-driven Workshop Concept	With participation of both textile and plastics SMEs, the pilot explores how production processes can integrate repurposing and resource recovery practices.
6.Optimization with embedded AI in Textiles within the production	Improves resource efficiency, enables real-time quality control, and reduces waste through intelligent systems.	IWU - Design-driven Workshop Concept	The future integration of digital tools and AI into the workshops has potential to optimize ideation and accelerate decision-making, though this is not yet implemented.
7.Textiles used in healthcare	Enhances functionality and patient care while circular design principles reduce the environmental impact of disposable medical fabrics.		

Construction Portfolio:

Table 3 Link between Construction Service Portfolio and Pilots (source: D3.3.3 Report, 2025)

Vertical	Objective / Value proposition	Related Pilots	Pilot description
1. Reducing Environmental Footprint with Smart Data	Demonstrate how digital monitoring and MES-based optimization can minimize energy and material waste in modular construction.	INTEMAC - Digital Transformation of Modular Construction	INTEMAC applied data visualization and process optimization tools in cooperation with KOMA Modular to improve production efficiency, reduce CO_2 emissions, and strengthen data-driven management in modular construction.
	Showcase how real-time performance data can improve energy efficiency and reduce carbon emissions in residential buildings.	TUKE - Smart Heat Recovery Performance Pilot	TUKE monitored and visualized heat recovery system performance in real time, achieving measurable reductions in heating energy use and promoting awareness of sustainable building technologies.
2. Digital Product Passports & Material Databases	Generate reliable environmental performance data for construction materials to support traceability and circular design.	HGK VZ - In-depth LCA Analysis for PVC Profiles	HGK Varaždin conducted a Life Cycle Assessment (LCA) of PVC profiles produced by Strela d.o.o., providing data that supports future digital product passports and material databases for transparent circular construction.
3. Renovation Using Recycled Materials & Advanced IT Tools	Demonstrate how lifecycle evidence can support reuse potential and circular renovation processes.	HGK VZ - In-depth LCA Analysis for PVC Profiles	The LCA of recycled PVC products identified opportunities for reuse and confirmed that secondary materials can match virgin quality, reducing environmental impact and supporting evidence-based circular renovation.
4. Changing Stakeholder Mindsets	Strengthen digital readiness and promote organizational adaptation among industrial stakeholders.	INTEMAC - Digital Transformation of Modular Construction	INTEMAC fostered awareness and acceptance of digital tools within KOMA Modular, encouraging data-driven decision-making and the gradual transition toward smart manufacturing.
	Increase awareness and engagement among users and clients through transparent energy data communication.	TUKE - Smart Heat Recovery Performance Pilot	TUKE demonstrated that visualizing real-time energy savings builds trust in circular technologies and motivates behavioral change toward energy-efficient living.
	Build internal capacity and environmental awareness through LCA-based decision-making.	HGK VZ - In-depth LCA Analysis for PVC Profiles	HGK Varaždin enhanced understanding of lifecycle thinking among company staff and management, fostering a culture of sustainability and continuous circular improvement.

Cross-sectoral Portfolio:

Table 4 Link between Cross-sectoral Service Portfolio and Pilots (source: D3.3.3 Report, 2025)

Vertical	Objective / Value proposition	Related Pilots	Pilot description
1. Sustainable Raw Materials and Traceability	Foster transparency and accountability in supply chains through traceability	HGK VZ - LCA Tools	Developed a user-friendly LCA tool enabling SMEs to assess carbon, water, and land footprints, raising awareness of material sustainability.

	tools, environmental data integration, and sustainable sourcing.	TUKE – Digital Twin Integration	Linked design data with environmental parameters to prepare automated waste reporting and enhance material traceability.
		SIIT – Circular and Digital Maturity Assessment	Introduced a combined diagnostic tool to guide SMEs toward adopting traceability solutions and integrating digital and circular metrics.
		KPT – Scouting & training for Sustainable Business Transformation	Provided ESG and lifecycle training for SMEs, including diagnostic tools to plan and monitor sustainable material use.
		IWU - Networking and Project Initiation for Circular Economy	Connected companies from multiple sectors to identify circular value chains and initiate projects focused on sustainable materials and reuse.
2. Circular Product Design and Competitiveness	Integrate circular principles—durability, modularity, and recyclability—into product and tool design to boost sustainability and competitiveness.	TECOS – Fast Prototyping and Development	Applied rapid prototyping and modular tool design to enable adjustable, resource-efficient, and traceable circular product development.
		TUKE – Digital Twin Integration Pilot	Implemented 3D design and automated routing tools to optimize component use and minimize design-related waste.
		PRO – Robotics & Assistance Systems	Demonstrated how robotics and AI applications can support circular production, maintenance, and reconditioning across industries.
3. Efficient Production and Remanufacturing	Promote resource efficiency and digital monitoring to reduce production waste and enable remanufacturing cycles.	INTEMAC – Test Before Invest	Tested the WORKSYS platform integrating energy and environmental data to improve resource management and reduce emissions.
		PBN – Training on Digital Technologies	Provided hands-on training on AI, robotics, and digital twins to enhance process efficiency and sustainability in manufacturing.
		PRO – Robotics & Assistance Systems	Supported SMEs in applying automation for sustainable and efficient production in wood, metal, and textile sectors.
4. Smart and Sustainable Distribution	Optimize logistics, production, and reporting systems using digital solutions to increase transparency and reduce emissions.	TUKE – Digital Twin Integration	Enabled real-time environmental data connection within design workflows, improving logistics coordination and sustainability insight.
		MTSW – Learning Network Climate Neutrality	Brought together SMEs from multiple sectors to co-create roadmaps for emission reduction and sustainable operations.
5. Circular Consumption and Behavioural Change	Encourage sustainable consumption through education, transparent communication, and community engagement.	FB – Sustainability Marketing Training	Helped SMEs learn how to effectively communicate sustainability to consumers using eye-tracking and emotional analytics.
		MTSW – Learning Network Climate Neutrality	Facilitated dialogue and learning to inspire SMEs to adopt circular practices and influence customer awareness.
6. Repair, Reuse, and Second Life	Support product longevity, repairability, and reuse through automation, modularity, and circular design.	PRO – Robotics & Assistance Systems	Showcased robotic applications for product repair, sanding, and reconditioning as enablers of circular production.
		PBN – Training on Digital Technologies	Addressed circular reuse and repair through the application of digital tools such as AI and predictive analytics.
7. Collection Systems & Collaborative Recovery	Enable effective collection, recovery, and recycling systems through collaboration and ESG-driven business models.	COMET – ESG Audit	Conducted ESG audits for SMEs to identify environmental improvement areas, including waste and resource recovery potential.
		KPT – Scouting & training for Sustainable Business Transformation	Connected SMEs with green technology providers to co-create strategies for waste reduction and recycling.
		SIIT – Circular and Digital Maturity Assessment	Guided SMEs in identifying digital enablers for recovery systems and linking them to regional DIH support services.

1.4. Towards the delivery of D3.4.2

The main aim of deliverable D3.4.2 is to present the Transnational Solution for the FACTORY with four Flagship Solution Models. The Solution provides a framework for:

- Transferring and replicating the knowledge and lessons gathered in the project, especially through D2.3.1 MoUs signed with additional DIHs
- Integrating the solutions and ensuring their continuation within PP organizations and networks

Understanding the interlinks and the delivery pathway of the Transnational Solution is important, as it provides a framework for replicating the Solution in new territories and offers valuable insights like the challenges companies face, the decision-making matrix from the IT Action Plan, and the Service Portfolios with clear instructions and guidelines on how the services can be implemented and replicated across territories.

The illustration below showcases the path towards the delivery of the four Flagship Solution Models:

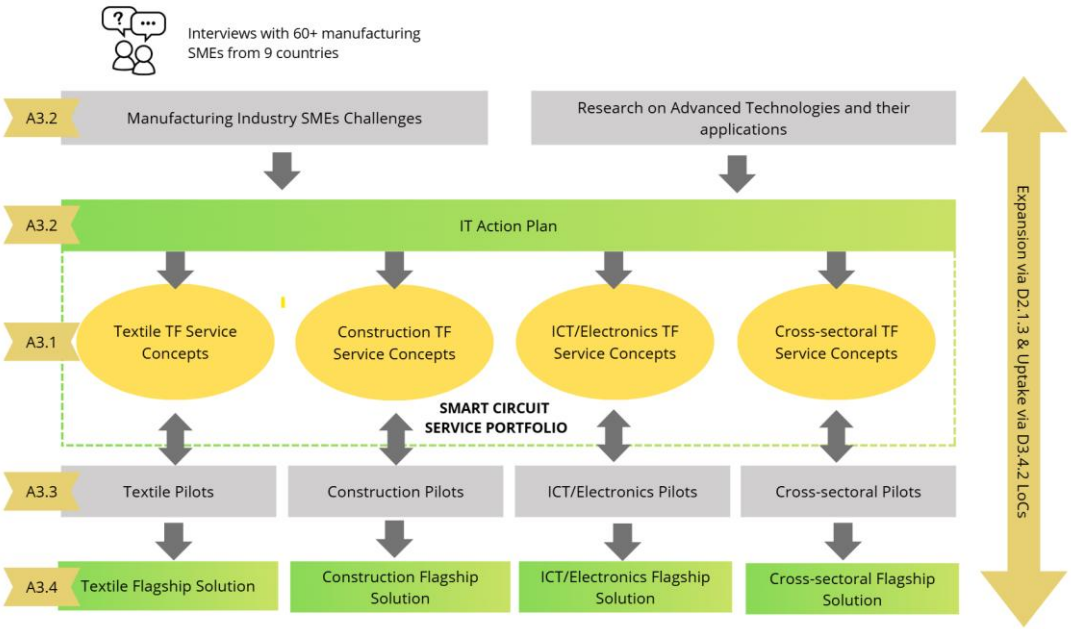


Illustration 1 Interlinks between the WP3 Activities (source: Author generated, 2025)

2. Flagship solution Model development

This section outlines a clear process for developing 4 Flagship Solution Models.

As showcased in Illustration 1, it can be seen that the four Flagship Solution Models have been linked with different project activities and have been developing throughout the duration of the whole project. To ensure the further development of the project results, project partners have been working on the Flagship Projects.

When it comes to the timeline, PPs have also been working on the Flagship Projects throughout the duration of the whole project, as different knowledge and results have been emerging. However, to structure the process and gather the data, PPs started discussing the Flagship Projects with a small brainstorming session during the in-person PP meeting in March 2025.

Following this meeting, a Flagship monitoring table (Annex 1) was created to ensure a structured approach to delivering information on the Flagship Projects. It has been agreed that PPs can deliver Transnational (where a minimum of two PPs from the consortium or partnering regions are participating) or Individual (where only one PP from the consortium is participating, but is building on Smart Circuit results) Flagship Projects.

Table 5Flagship Monitoring Table (source: Project Generated, 2025)

	partner providing data	Task Force name	Flagship title (Concise title of the initiative)	Field/Industry targeted	Short description (Max 1,000 characters - explain main concept and aims of the flagship initiative)	Steps to achieve objectives	Smart Circuit partners involved (List all participating PPs and their roles)	External DIHs/ Industry Digital Centres involved	Describe the results the flagship builds upon, TF services or pilot results (DT3.2 / DT3.3) – if applicable	Targeted funding opportunity – source of funding	full project title or acronym (if you have)	status	project submission deadline	Duration of Flagship Project (Intended Start and End)	main topic	short description	budget euro	link to the call/ supporting matrials etc	other comments
1	KPT	TF All	EDIH #2	All	digital transformation of SME	approved	none	T-Mobile Polska, T-Mobile Polska Business Solutions, Klaster BIM, Entra Group, Autor, Improvement Factory, Cyfronet AGH, Jagiellonian University, Intermarium & Profesal.	to be completed	Digital Europe	European Digital Innovation Hub #2	Approved		1.10.2026 + 36 mths	Enhancement and professionalization of services provided by the EDIH, including the integration of solutions developed and validated through Task Forces and pilot projects within SMART CIRCUIT		4,5 mln eur		
2	KPT	TF ICT/ Electronics, TF Construction	CIRC22zero	ICT/ Electronics, Construction	digital transformation of SME	approved	Partnering regions	Linea Business Development – Finland, Tallinn University of Technology – Estonia, Tallinn Science Park Tehnopol – Estonia, Krakow Technology Park Ltd. – Poland, KX Institute for Strategic Aesthetics – Germany, Academy of Fine Arts Saar – Germany, Riga Technical University – Latvia, Business Union of Latvia – Latvia, Luleå University of Technology – Sweden, VMG Lignum Systems – Lithuania, "VIZULO" Ltd. – Latvia, Industriélt	to be completed	Interreg Baltic Sea	Driving Collaborative Innovation towards Decarbonization and Advanced Manufacturing in SMEs across the Baltic Sea Region	Selected for funding		01/03/2025 - 29/02/2028	Driving Collaborative Innovation towards Decarbonization and Advanced Manufacturing in SMEs across the Baltic Sea Region, implemented under the Interreg Baltic Sea Region Program.	The project's goal is to support small and medium-sized enterprises (SMEs) in the Baltic Sea Region (BSR) in their decarbonization process and enhance their ability to adopt modern manufacturing technologies in the in their decarbonization process and enhance their ability to adopt modern manufacturing technologies in the wood and electronics sectors. The project helps companies develop more sustainable and advanced	3,296,687.00		This initiative will also engage regional authorities, facilitating knowledge exchange and co-creation activities at the international level.
3	KPT	Construction	ReConstruct4CE	Circular Economy in construction sector	The ReConstruct4CE project helps the construction industry in Central Europe become greener and more efficient. We have combined the best tools, training programs, and digital solutions from seven previous initiatives into one accessible framework. Our "hub-of-hubs" platform provides the practical services needed to build a competitive, waste-free, and climate-friendly economy.	in progress	There are Smart Circuit regions involved in the new project proposal as Slovenia, Italy, Slovakia, Austria etc.however there is none of the Partners from SMART CIRCUIT .	Slovenian National Building and CivilEngineering Institute (Slovenija (SI), Eurac Research PP Italia (IT) Krakow Technology Park (PL), Association Cluster of Information Technologies in Building Industry (PL), Future Agency of Construction PP Österreich (AT), Active Slovakian Innovation and Energy Agency (AT)	WP1 - Circular Innovation Academy D.1.4, WP2 - DIH NET WP 3 - service portfolio D.3.3	Interreg Central Europe Capitalisation Call	Recovery in Construction across borders: leveraging digital knowledge hubs, applied trainings, and material solutions for a more resilient and competitive Central Europe.	Under evaluation	11.2025	Autumn 2026 - 2028	Circular economy	ReConstruct4CE accelerates the transition to a circular economy in Central Europe's construction sector—one of the region's most resource-intensive industries. By consolidating the results of seven successful Interreg projects (including ReBuilt, BIM4CE, and VIRIDI), project turns individual tools and digital platforms into a unified regional powerhouse. Through a central "hub-of-hubs," project provides stakeholders with easy access to proven innovations,	1.214.213,00 EUR		
					The main objective of the REUSE project is to increase skills and knowledge through a cross-border mentoring program that aims to increase the use of technological and non-technological solutions for introducing the cascade use model for residual raw materials from	Circular economy	none		Circular business models, "Green product innovations"	EFRE SI-AT		Approved	already ongoing	01/11/2023 - 01/11/2026	Circular economy	Closing material cycles therefore presents us with new challenges, and we must pay more attention to the use of recycled or processed materials, renewable raw	206 595,90 €		

During each PP meeting, from March 2025 to December 2025, PPs were doing a short update on the Flagship Monitoring Table, as new projects were submitted.

Finally, during the in-person PP meeting in Croatia in October, PPs started discussing the potential for future collaboration and identified the topics of interest. It was decided that PPs will keep meeting once per year after Smart Circuit ends, as a Cross-Sectoral Flagship, and each PP will bring knowledge from the Individual Flagships, ensuring the ongoing exchange and the basis for future projects. The fresh promising insight for maintaining collaboration sets the October 2025 renewal of DIGITAL funding for 83 EDIHs (with a reinforced AI focus). It creates a clear opportunity to maintain and deepen collaboration because it signals (1) continuity of the EDIH network, (2) new/extended resources to deliver services, and (3) a shared EU-wide priority around AI adoption and compliance support. In practice, this makes it easier for partners to plan multi-year joint activities (pilots, test-before-invest services, SME support pathways), align roadmaps around "AI-first" use cases, and keep cooperation active through a stable, funded interface rather than ad-hoc projects. Three project partners: KPT, PROFACTOR and PBN have been granted for EDIH2.0.

To ensure this exchange, PP2/FB created the template (see Annex 2) for the workshop. PPs had to indicate the topics they were interested in to continue collaboration and later were connected to continue talks with matching partners.

Table 6 Future Flagships Identification Table (source: Project Generated, 2025)

Project Partner	Construction	Artificial Intelligence	Electronics	Textiles	Circular Econmy Topics in General	Communication of Circular Economy	Robotics	Smart Materials	Manufacturing Processes	Additive Manufacturing	Healthcare	Data Analytics
FB	Yes	Yes	Yes	Maybe	Yes	Yes	Maybe	Maybe	Maybe	Maybe	Maybe	Yes
KPT	Yes	Yes	Yes	No	Yes	Yes	No	Maybe	Maybe	Maybe	No	Maybe
Pro												
IWU	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
mTSW	No	Yes	Yes	Yes	Maybe	Maybe	Maybe	Maybe	Yes	Yes	Yes	Maybe
SIIT	Maybe	Yes	Maybe	Maybe	Maybe	Maybe	Yes	Yes	Yes	Yes	No	No
COMET	No	Yes	Maybe	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes
TECOS	Maybe	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Maybe
PBN	Maybe	Yes	Yes	Maybe	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TUKE	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
INTEMAC	Maybe	Yes	Yes	No	Yes	Maybe	Yes	Maybe	Yes	Yes	No	Maybe
HGK	Yes	Yes	Maybe	Yes	Yes	Yes	Maybe	Yes	Yes	Maybe	Maybe	Maybe

This process can be used in yearly meetings after the project ends, ensuring that PPs indicate their key topics every year and are matched based on common interests to discuss future cooperation opportunities.

To start the process, PPs will have a workshop during the last in-person PP meeting in Slovenia, where they will map all available funds in the upcoming years, update each other on the projects they are currently working on, indicate their topics of interest, and then be grouped based on the indicated topics to brainstorm. PP2/FB will create and coordinate this workshop and provide a model for the PPs for the upcoming years. The workshop will later be switched to an online format: Year 2027: KPT; Year 2028: mtSW; Year 2029: TUKE; Year 2030: TECOS; Year 2031: PBN (see Section 3.4 for more information).

According to the D2.4.1 Guidance document, the timeline for the document delivery was as follows:

Table 7 The timeline for the delivery of the A3.4 deliverables (source: Project generated, 2025)

Task to Achieve	Deadline	Responsibility
Draft of the guidance document and template - incl. criteria for Flagships	10 June 2025	TECOS (Lead Partner of A3.4)
Review this guidance and share feedback	20 June 2025	All Partners
Submission of draft Flagship Solution descriptions	20 July 2025	All Interested PPs / TF Leads
Consolidate proposals, align with partners and target funding	July - September 2025	TF Leaders, FB, TECOS, PBN, Funding Experts
Secure Letters of Commitment and external partner Memorandum of Understanding	August - December 2025	All Interested PPs
Submit proposals to EU/regional programmes	August - December 2025	All Interested PPs
Initiate promotion of Flagship system	From October 2025 onward	PBN (Communication Lead)
Contribute to DT3.4.2 & DT3.4.3 preparation	Period 6 (by March 2026)	All Partners (led by FB and PBN)

The deadline for signing the LoCs has been moved, as it has been decided to combine the LoCs from WP1, WP2, and WP3 into one document. As this requires coordination of three WPs and the PPs responsible for their delivery, as well as gathering information from the PPs, the deadline has been extended to the end of March. More information on the LoCs can be found in Section 4.

3. Four Flagship Solution Models

This section showcases the four Flagship Solution Models, presenting the transnational solution for each Task Force. The Transnational Solution consists of a roadmap developed based on the PPs' piloting activities and key takeaways; Transnational Flagship projects submitted to ensure the continuation of the project's results, with a minimum of two PPs or partnering regions from Smart Circuit participating; individual Flagships where PPs build on the Smart Circuit results and are the only ones participating from the consortium, ensuring an even broader transfer of results; and finally, a plan to take up the service portfolios, ensuring that the knowledge generated in the project is embedded in the regional ecosystem and that the PPs continue to support SMEs in addressing circular challenges.

The section is split into four parts:

- Textile Flagship Solution Model
- Construction Flagship Solution Model
- ICT/Electronics Flagship Solution Model
- Cross-Sectoral Flagship Solution Model.

3.1. Textile Flagship Solution Model

This section outlines the Textile Flagship Solution Model, starting with an analysis of the main feedback on the challenges faced by textile manufacturing SMEs. This analysis led to the development of a decision-making matrix for selecting the most suitable technologies to address the identified challenges, which in turn informed the development of Textile Service Portfolios. These portfolios were tested through the FACTORY pilots and culminated in a final Flagship Project that ensures the continued transfer of knowledge and best practices through new initiatives.

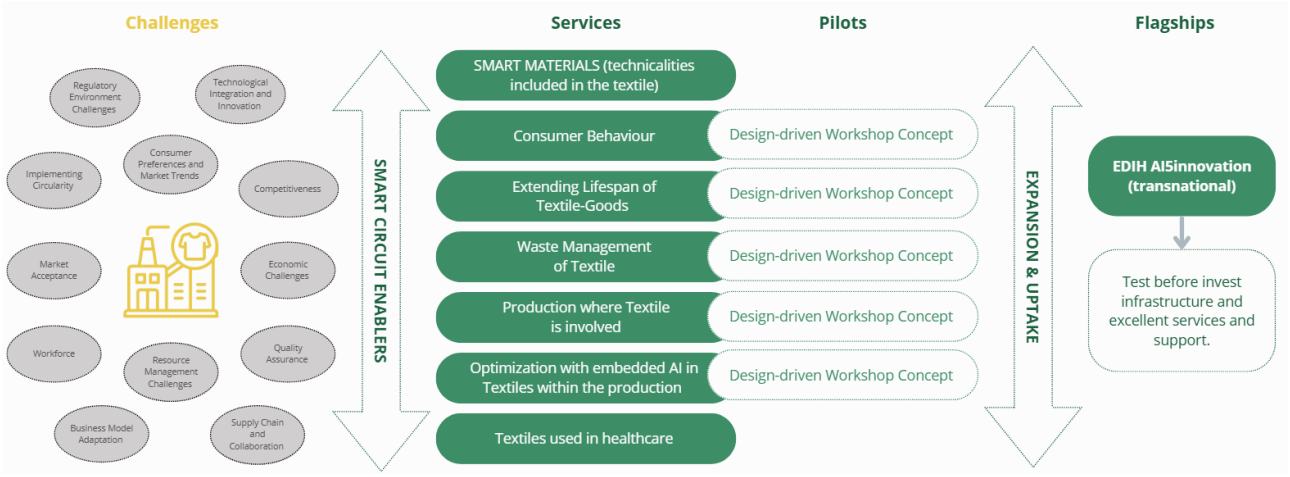


Illustration 2 Textile Flagship Solution Model (source: Author generated, 2025)

The Transnational Solution, which addresses the challenges in the textile sector, has been created based on the textile pilot and the service portfolios delivered by the Task Force. This solution provides a creative approach towards involving SMEs (including the ones in rural areas) into workshops aimed at developing innovative solutions and approaches in the field of circularity:

Design-Driven Workshop Concept for Circularity in Textiles

This category showcases a design-driven workshop concept and outlines the key steps required for companies, clusters, or BSOs to deliver the solution from preparation to expected outcomes, enabling the creative co-creation of circular solutions for textile sector.

Step 1: Identification of SME Needs and Expectations

The first step is the selection of participating SMEs from different sectors to ensure diverse perspectives. Interviews are conducted with company representatives to understand their expectations, current challenges, and perceptions of circular economy concepts. This step ensures that the workshop design responds to the real challenges of SMEs, particularly limited capacity and hesitation toward large-scale solutions.

Step 2: Definition of Workshop Concept and Methodology

Based on the insights collected, a design-driven workshop concept is defined. The methodology combines scenario design, futures thinking, and experimental formats to create unconventional and motivating entry points to circularity. The focus is placed on creativity, co-creation, and practical relevance, ensuring that activities remain accessible for SMEs with limited time and resources.

Step 3: Selection of Experts, Trainers, and Locations

Relevant experts and trainers are identified to facilitate the workshops and guide the creative process. Workshop locations are selected to suit rural contexts as well and support hands-on collaboration.

Step 4: Integration of Digital Tools and AI for Ideation Support

Digital tools and AI-based approaches are prepared for integration into the workshops to support faster ideation, visualization of scenarios, and decision-making.

Step 5: Co-creative Workshop Implementation

The workshop series is implemented with participating SMEs, bringing together diverse groups to work on concrete circular challenges. Through co-creation and experimentation, participants develop initial circular solutions tailored to their specific contexts. The focus remains on small, achievable actions rather than complex transformation.

Step 6: Development of Tailored Circularity Roadmaps

Based on the outcomes of the workshops, tailored circularity roadmaps are prepared for each participating SME. These roadmaps translate creative ideas into structured next steps, providing clarity on how companies can continue their circular transition.

Challenges addressed:

Competitiveness, Market Acceptance, Workforce, Business Model Adaptation, Implementing Circularity, Supply Chain and Collaboration

The Flagship Solution Model consists of the Transnational Flagship developed by PP3/PRO and PP9/PBN, which ensures the continuation of the piloted solutions and their expansion to new stakeholders. In addition, the Solution Model outlines the services from the service portfolio to be taken up by the PPs/ASPs, ensuring that the knowledge generated within the project reaches end users and supports them in addressing circularity challenges through the use of advanced technologies.

Transnational Flagship

Flagship name: EIDH AI5innovation - Eurpean Digital Innovation Hub AI5innovation

Field/industry targeted: All with focus on production & manufacturing

Main topic: Digital transformation of SME

Status: Approved

Smart Circuit PPs involved: PP3/PRO, PP9/PBN

External DIHs/ Industry Digital Centres/ other organizations involved: EDIH Innovate, EDIH AI5production, Mechatronic-Cluster

The results the flagship builds upon, TF services or pilot results (DT3.2 / DT3.3): Trainings & Skill Development, Test before Invest

Targeted funding opportunity - source of funding: Digital Europe

Duration: 01.11.2026 – 31.10.2029

Short description: The EDIH AI5innovation has a regional focus to the north-east of Austria and mainly addresses manufacturing SMEs and mid-caps in Austria. The overall objective of the EDIH AI5innovation is to consolidate the Industry 4.0 maturity of SMEs and mid-caps in the region and transfer them to Industry 5.0 companies by providing all four foreseen service pillars of an EDIH. This will be achieved by offering established test before invest infrastructure and excellent services and support.

Budget: around 6.725.424€

Useful links: here

Long-term uptake of the service portfolios

After the project ends, PPs plan to adopt the following services from the Textile service portfolio and offer them to their ecosystem as support to enable digitally driven circularity:
LPP3/PRO: The topics and services developed by the Textile Task Force will be integrated into AI5innovation's service portfolio; however, they will be adapted to align with the EDIH's production focus.

PP4/IWU: IWU will transfer the knowledge and the design-driven workshop concept to the innovation cluster Circular Saxony and smart3 - they will use it in their daily consulting, training and inspiration work with their members from various industries.

PP5/mtSW: microTEC Südwest will provide trainings with a mix of knowledge transfer and best practice parts, e.g. as part of the microTEC SkillsLab project and/or as part of the annual event To Connect - Smart Textiles & Mikrosystemtechnik.

PP6/SIIT: SIIT plans to continue producing podcasts and refining the matchmaking process after the project's completion, ensuring that knowledge transfer between academia and SMEs becomes a long-term, sustainable practice.

PP7/COMET: COMET is committed to offered services that are aimed at enhancing SMEs efficiency and productivity by leveraging lean principles and cutting-edge digital technologies to streamline processes and minimize waste and integrating this concept in the whole EDIH ecosystem. This include the access to test bed and living lab facilities such as LEF Lean Experience Factory.

PP9/PBN: PBN will integrate the design-driven workshop concept and circular textile topics developed by the Textile Task Force into its SME support activities, including training programmes and co-creation workshops. The results will also be linked to the AI5innovation EDIH ecosystem, enabling SMEs to access digital innovation services such as test-before-invest and support for digital and circular transformation in manufacturing sectors

PP11/INTEMAC:Intemac will build on the the knowledge obtained through textile service portfolio and where appropriate, will use this information to EDIH services to optimize the services provided.

PP12/HGK: The HGK Varaždin will continue to foster links between companies in the textile sector and the research community, particularly the Faculty of Textile Technology, Varaždin Department and will strive to initiate new projects related to emerging technologies in the textile sector, especially those supporting the transition towards a circular economy in the textile sector.

3.2. Construction Flagship Solution Model

This section outlines the Construction Flagship Solution Model, starting with an analysis of the main feedback on the challenges faced by construction manufacturing SMEs. This analysis led to the development of a decision-making matrix for selecting the most suitable technologies to address the identified challenges, which in turn informed the development of Construction Service Portfolios. These portfolios were tested through the FACTORY pilots and culminated in a final Flagship Project that ensures the continued transfer of knowledge and best practices through new initiatives.

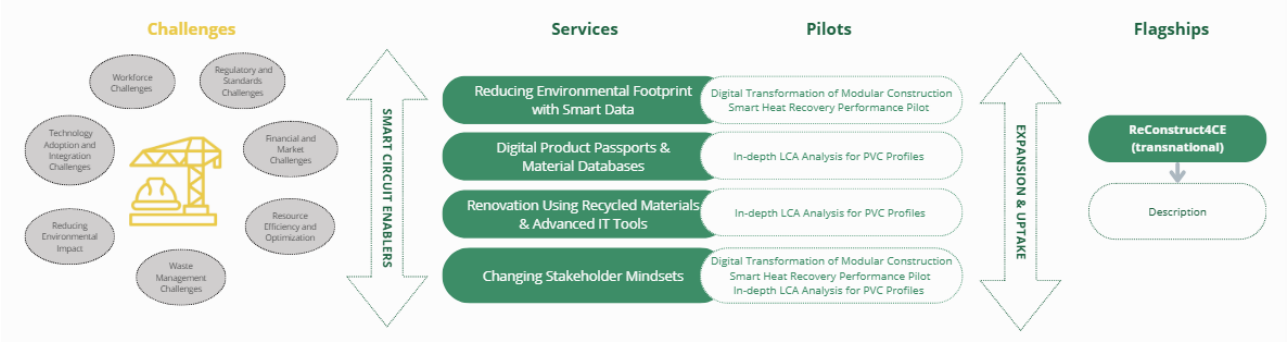


Illustration 3 Construction Flagship Solution Model (source: Author generated, 2025)

The Transnational Solution, which addresses the challenges in the construction sector, has been created by combining the results of the Piloted solutions and the service portfolios delivered by the Task Force. This solution provides a digitally driven roadmap for the circular transformation of the construction sector:

Phase 1: Using Digital Tools to Embed Sustainability and Process Efficiency from the Production

This category focuses on helping construction companies introduce digital tools to improve transparency, coordination and sustainability during the production and planning stages. The approach emphasizes aligning technological ambition with operational feasibility to ensure that digitalization supports daily processes rather than making them more complex.

Step 1: Analysis of Production Setup and Operational Needs

A detailed analysis of the company's production environment is conducted to identify bottlenecks, data gaps, and sustainability-relevant processes. This step ensures that digital tools address real operational challenges.

Step 2: Screening and Selection of Suitable Digital Tools

Any available digital solutions (e.g. digital twins), including open-source tools, are reviewed and compared with the company's needs, level of digital maturity and budget constraints. Any unrealistic solutions are excluded.

Step 3: Testing Real-Time Data Visualization

Simple demonstrators, such as real-time dashboards, are developed to visualise production data and enhance process transparency, providing a cost-effective solution prior to investing in more complex systems.

Step 4: Gradual Introduction of Structured Systems

Based on testing results, companies are supported in implementing digital solutions, such as Manufacturing Execution Systems or digital twins, as a practical next step for data-driven production management and traceability.

Step 5: Definition of a Realistic Digitalization Roadmap

Clear next steps are defined, supporting continued digital transformation beyond the pilot and aligning sustainability goals with production efficiency.

Challenges addressed:

Technology Adoption and Integration Challenges, Resource Efficiency and Optimization, Financial and Market Challenges, Technology Adoption and Integration Challenges, Workforce Challenges.

Phase 2: Digital Monitoring and Communication of Energy Performance

This category showcases how digital tools can make energy efficiency and circular construction solutions more visible and understandable for residents, clients and stakeholders. The emphasis is on combining technical monitoring with transparent communication.

Step 1: Installation and Calibration of Monitoring Systems

Sensors and data collection systems are installed to capture real-time energy performance and environmental indicators, with careful calibration to ensure reliable results.

Step 2: Reliable Data Transfer and Validation

Data flows are stabilized and validated to account for user behaviour and external conditions. This ensures that performance indicators remain meaningful.

Step 3: Development of Simple Digital Communication Tools

A user-friendly online platform is created to display energy savings, CO_2 reduction, and financial benefits in a clear and accessible way.

Step 4: Communication of Measurable Benefits

Digital dashboards are used as communication tools to build trust and improve understanding of sustainable construction solutions among residents, clients and other stakeholders.

Step 5: Preparation for Replication

Key lessons are documented to support future deployment in additional buildings or projects.

Challenges addressed:

Reducing Environmental Impact, Resource Efficiency and Optimization, Technology Adoption and Integration Challenges, Customer and Market Readiness Challenges, Financial and Market Challenges.

Phase 3: Life Cycle Assessment as a Tool for Waste Reduction and Circular Material Use

This category focuses on using Life Cycle Assessment to identify environmental hotspots, improve waste management, and support circular material choices in construction-related manufacturing.

Step 1: Selection of Products for Assessment

Relevant construction products are selected for LCA to ensure that results are directly applicable to daily operations.

Step 2: Mapping of Material Flows and Waste Streams

Production processes are analysed to document material inputs, recycled content, waste streams, and emissions.

Step 3: Identification of Environmental Hotspots

LCA results are used to identify stages with the highest environmental impact, including handling of complex or contaminated waste.

Step 4: Definition of Circular Improvement Measures

Companies are supported to use LCA insights to define practical improvements, such as increasing the use of recycled materials, improving sorting processes, and enhancing the traceability of materials.

Step 5: Internal Awareness and Capacity Building

Employees are actively involved in the assessment process, strengthening internal understanding of circular practices and environmental performance.

Challenges addressed:

Regulatory and Standards Challenges, Reducing Environmental Impact, Waste Management Challenges, Resource Efficiency and Optimization, Customer and Market Readiness Challenges.

The Flagship Solution Model has been created to bring the Transnational Solution to the market and expand it to new regions and organizations. The Model consists of the Transnational Flagship developed by KPT and the following CE regions: Zahodna Slovenija, provincia Autonoma di Bolzano/Bozen, Salzburg, Košický kraj, which ensures the continuation of the piloted solutions and their expansion to new stakeholders. In addition to the transnational Flagship, LP1/KPT also submitted an individual Flagship, as the only organisation from the Smart Circuit consortium. This enables the expansion of Smart Circuit knowledge to new partners and a new region, namely the Interreg Baltic Sea Region. Finally, the Solution Model outlines the services from the service portfolio to be taken up by the PPs/ASPs, ensuring that the knowledge generated within the project reaches end users and supports them in addressing circularity challenges through the use of advanced technologies.

Transnational Flagship

Flagship name: ReConstruct4CE

Field/industry targeted: Construction

Main topic: Circular Economy in construction sector

Status: Pending approval

Smart Circuit PPs involved: LP1/KPT

External DIHs/ Industry Digital Centres involved: Slovenian National Building and CivilEngineering Institute (Slovenija (SI), Eurac Research PP Italia (IT), Association Cluster of Information Technologies in Building Industry (PL), Future Agency of Construction PP Österreich (AT), Active Slovakian Innovation and Energy Agency (AT)

The results the flagship builds upon, TF services or pilot results (DT3.2 / DT3.3): WP1 - Circular Innovation Academy A1.4, WP2 - DIH NET, WP3 - service portfolio A3.3

Targeted funding opportunity - source of funding: Interreg CE

Duration: Autumn 2026 - 2028

Short description: ReConstruct4CE accelerates the transition to a circular economy in Central Europe's construction sector, one of the region's most resource-intensive industries. By consolidating the results of seven successful Interreg projects (including ReBuilt, BIM4CE, and VIRIDI), project turns individual tools and

digital platforms into a unified regional powerhouse. Through a central "hub-of-hubs," project provides stakeholders with easy access to proven innovations, regardless of their location. The goal is to bridge the gap between urban and rural areas, making the construction industry more competitive, resilient, and climate-neutral.

Budget: 1.214.213,00 EUR

Long-term uptake of the service portfolios

After the project ends, PPs plan to adopt the following services from the Construction service portfolio and offer them to their ecosystem as support to enable digitally driven circularity:

LP1/KPT: KPT will continue offering trainings, digital maturity assessment, test-Before-Invest services through hub4industry (eDIH of KPT) to help SMEs validate circular product and process improvements in the construction-related manufacturing ecosystem. KPT has also a large ecosystem of organizations focused on construction ready to take the action to be more sustainable. However KPT will continue to strengthen cooperation between companies in the construction sector and the research community, particularly those that contribute to the shift towards a circular economy in the construction companies.

PP2/FB: FB is involved in many projects aimed at changing attitudes towards sustainability. Therefore, this focus will also be maintained in future projects. Reducing the environmental footprint and creating a digital product passport are also expected to be the focus of some of the following projects.

PP8/TECOS: TECOS will continue offering Test-Before-Invest services through DIH INDUSTRY to help SMEs validate circular product and process improvements in the construction-related manufacturing ecosystem. The uptake will focus on rapid prototyping and testing/validation of design changes and material substitutions, alongside guidance on design for disassembly, repair and longer product lifetime. Where feasible, TECOS will further develop these elements and transfer the Factory approach through relevant national networks.

PP10/TUKE: TUKE will continue offering tranings and expert consultation services focusing on digital and circular assessments and innovation piloting and scaling up for industry, and will continue in preparation and implementation of innovation projects supporting the industry and society in digital and circular transition, especially in the domains of digital monitoring of energy performance and Life-cycle Assessment as a tool for waste reduction and circular material use for environmental impacts improvement

PP11/INTEMAC: Intemac will further provide Test-Before-Invest support under EDIH DIGIMAT, enabling SMEs to assess and de-risk circular upgrades in products and manufacturing processes within the construction manufacturing value chain. The service portfolio will emphasize accelerated prototyping together with practical testing and verification of revised designs and alternative material solutions. It will also include advisory support focused on designing for easy disassembly, enhanced repairability, and increased product durability.

PP12/HGK: The HGK Varaždin will continue to strengthen cooperation between companies in the construction sector and the research community, particularly those that contribute to the shift towards a circular economy in the construction companies. In this regard, attention will be given to the promotion and further enhancement of the Light LCA and other services offered by DIH Connect Varaždin, as useful instruments for helping companies evaluate and improve the environmental performance of their products and processes.

3.3. Electronics Flagship Solution Model

This section outlines the ICT/Electronics Flagship Solution Model, starting with an analysis of the main feedback on the challenges faced by ICT/Electronics manufacturing SMEs. This analysis led to the development of a decision-making matrix for selecting the most suitable technologies to address the identified challenges, which in turn informed the development of ICT/Electronics Service Portfolios. These portfolios were tested through the FACTORY pilots and culminated in a final Flagship Project that ensures the continued transfer of knowledge and best practices through new initiatives.

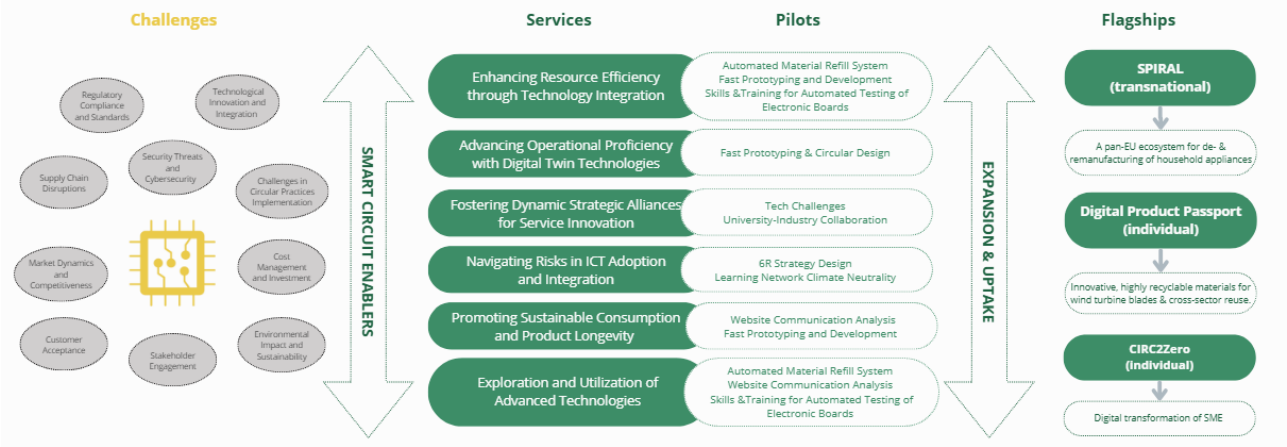


Illustration 4 ICT/Electronics Flagship Solution Model (source: Author generated, 2025)

The Transnational Solution, which addresses the challenges in the ICT/electronics sector, has been created by combining the results of the Piloted solutions and the service portfolios delivered by the Task Force. This solution provides a digitally driven roadmap for the circular transformation of the ICT/electronics sector:

Phase 1: SMEs Capacity Building on Circular Topics Through Workshops

This category focuses on enhancing SMEs' understanding of the principles of the circular economy, ESG requirements and pathways to climate neutrality, through structured, practice-oriented capacity-building activities. The approach involves workshops, learning networks and facilitated peer exchanges to ensure that companies progress from awareness to concrete strategic and operational action.

Step 1: Building Internal Expertise Within Support Organizations

Before engaging SMEs, internal teams within clusters, technology parks, and other BSOs are trained on circular economy frameworks such as 6R (Reduce, Reuse, Recycle, Recover, Rethink, Redesign), ESG integration, sustainability reporting standards (e.g. CSRD, VSME), etc. This creates a shared knowledge base and ensures consistency and quality in external delivery.

Step 2: Introductory Workshops for SMEs on a Chosen Circular Economy Topic

Short, targeted workshops to introduce SMEs to the concepts of the circular economy, its regulatory drivers and the practical implications for ICT and electronics SMEs. The format is adapted according to company maturity level, with separate sessions for start-ups, growing SMEs and more established companies.

Step 3: Diagnostic and Readiness Assessments

Participating companies carry out structured diagnostics, such as 6R analyses and ESG readiness checks, to identify gaps in data, processes and governance. These assessments provide a basis for prioritizing actions and investments.

Step 4: Co-creation of Company-Specific Roadmaps

Based on diagnostic results, SMEs are supported in co-creating tailored roadmaps for circular transformation, climate neutrality, sustainability reporting, etc. The learning-by-doing approach ensures ownership and relevance.

Step 5: Peer Learning and Learning Networks

Where possible, SMEs are brought together in small learning networks to share experiences, visit production sites and discuss specific challenges. This trusted environment reduces engagement barriers and encourages continuous improvement.

Challenges addressed:

Challenges in Circular Practices Implementation, Regulatory Compliance and Standards, Stakeholder Engagement, Environmental Impact and Sustainability, Customer Acceptance, Market Dynamics and Competitiveness

Phase 2: Tech Matchmaking Between SMEs and Innovation Providers

This category connects SMEs with universities, research organizations and ICT solution providers to help companies identify and address the right technological challenges, and to give them access to relevant knowledge and innovation. The focus is on structured matchmaking formats that facilitate meaningful collaboration and go beyond one-off contacts.

Step 1: Mapping Innovation Suppliers and SMEs Needs

Research groups, PhD projects, ICT solution providers, and digital solution portfolios are systematically mapped, together with SME challenges related to digitalisation, circularity, and sustainability.

Step 2: Awareness-Raising on Collaboration Models

SMEs are introduced to collaboration formats such as joint R&D, pilot projects, and Horizon Europe partnerships through workshops, podcasts, and practical examples. This helps to simplify cooperation with universities and research organizations.

Step 3: Structured Matchmaking Formats

Matchmaking is implemented through needs-based calls, tech challenges, or facilitated brokerage events. SMEs bring concrete problems, while ICT providers and research teams propose solutions in a transparent and co-creative format.

Step 4: Facilitation of Negotiation and Partnership Building

Dedicated facilitation helps to align expectations, timelines, IP issues and resource commitments. Tools such as negotiation simulations and templates can help to reduce disagreement between partners.

Step 5: Post-Match Support and Follow-Up

Following the matchmaking process, companies receive support to help them progress from the conceptual stage to implementation. This support includes technical validation, funding alignment and coordination between partners.

Challenges addressed:

Technological Innovation and Integration, Market Dynamics and Competitiveness, Stakeholder Engagement, Cost Management and Investment, Supply Chain Disruptions.

Phase 3: Assisting Companies in Testing and Implementing Advanced Solutions

The focus of this category is to reduce the risks associated with adopting advanced technologies and circular solutions by providing access to testing, prototyping, demonstrations and hands-on training. The aim is to transition innovations from the conceptual stage to real-world application in a controlled environment.

Step 1: Identification of Use Cases and Pilot Scenarios

Together with SMEs, define concrete use cases, such as circular product redesign, automated testing, robotics integration, or material flow optimization.

Step 2: Rapid Prototyping and Testing

Short design-prototype-test loops are used to validate concepts at an early stage, before significant investment is made. These loops include reverse engineering, additive manufacturing and modular design approaches.

Step 3: Demonstrators and Training-Based Implementation

Demonstrators, such as automated testing cells or robotic assistants, are used to train staff and validate workflows in realistic environments. Skills development is integrated into the implementation process.

Step 4: Integration into Production and Operations

Validated solutions are adapted for integration and scaling within existing production systems, documentation practices and digital infrastructures.

Step 5: Evaluation and Replication

Results are evaluated in terms of performance, sustainability impact, and usability. Successful solutions are documented as best practices that can be replicated for other SMEs and regions.

Challenges addressed:

Technological Innovation and Integration, Environmental Impact and Sustainability, Cost Management and Investment, Challenges in Circular Practices Implementation, Stakeholder Engagement, Supply Chain Disruptions, Security Threats and Cybersecurity, Market Dynamics and Competitiveness.

Phase 4: Sustainability Communication and Website Usability

This category ensures that SMEs communicate their sustainability and circular economy efforts in a clear, credible, and engaging way. By improving website usability and monitoring user impressions, companies can strengthen trust, transparency, and market positioning.

Step 1: Assessment of Current Sustainability Communication

Company websites are analysed to gain an understanding of how sustainability information is presented and structured, and how it is perceived by users.

Step 2: Usability and Perception Testing

Advanced methods such as eye-tracking and emotional analysis are used to identify which content attracts attention, triggers engagement, or causes confusion.

Step 3: Development of Practical Recommendations

Companies receive concrete, actionable recommendations based on test results to improve the clarity, credibility and emotional impact of their sustainability communications.

Step 4: Monitoring and Continuous Improvement

Companies are encouraged to regularly monitor user behaviour and feedback. This allows sustainability communication to evolve alongside regulatory and market developments.

Challenges addressed:

Customer Acceptance, Market Dynamics and Competitiveness, Stakeholder Engagement, Environmental Impact and Sustainability, Regulatory Compliance and Standards

The Flagship Solution Model has been created to bring the Transnational Solution to the market and expand it to new regions and organisations. The Model consists of the Transnational Flagship developed by PP8/TECOS and PP9/PBN, which ensures the continuation of the piloted solutions and their expansion to new stakeholders. In addition to the transnational Flagship, PP6/SIIT also submitted an individual Flagship, as the only organisation from the Smart Circuit consortium. This enables the expansion of Smart Circuit knowledge to new partners and a new region, in this case at the regional level. Finally, the Solution Model outlines the services from the service portfolio to be taken up by the PPs/ASPs, ensuring that the knowledge generated within the project reaches end users and supports them in addressing circularity challenges through the use of advanced technologies.

Transnational Flagship

Flagship name: SPIRAL – Systemic Pathways for Innovative Remanufacturing Loops

Field/industry targeted: ICT/ Electronics and Household appliances Sector / ICT / Electronics (AI platforms, digital manufacturing & remanufacturing)

Main topic: The project builds a pan-EU ecosystem for de- and remanufacturing of household appliances, anchored by the SPIRAL label.

Status: Submitted, pending approval

Smart Circuit PPs involved: PP8/TECOS, PP9/PBN

External DIHs/ Industry Digital Centres involved: Core consortium incl. Elettrotecnica ROLD (coord.), POLIMI, ARÇELIK, ENVIE, CCIS (Slovenia), CHALMERS, AFIL, Intellico, LOMARTOV, others.

The results the flagship builds upon, TF services or pilot results (DT3.2 / DT3.3):

New project application SPIRAL builds on the SMART CIRCUIT Circular Industry Factory results, notably the D3.1.3 service portfolios and the piloted solutions, including TECOS' "Fast Prototyping and Development of Circular Products" test-before-invest approach, partner PBN reinforces uptake through its communication and digital campaign experience and the wider CIRCUIT DIH ecosystem for replication and market uptake.

Targeted funding opportunity - source of funding: HORIZON-CL4-INDUSTRY-2025-01-TWIN-TRANSITION-01

Duration: 48 months.

Short description: SPIRAL project proposal aims to establish a pan-European, multi-stakeholder ecosystem for demanufacturing and remanufacturing of household appliances, anchored by the SPIRAL label and supported by distributed HUBs. The project develops and demonstrates an AI-based decision-support platform (ARI) using multi-criteria decision-making that integrates environmental, social, and economic dimensions (including LCA/LCC/S-LCA), and validates remanufacturing/repurposing approaches in real operational environments, progressing from TRL5 to TRL7 across three circular flows (household-to-household, household-to-other-sectors, and other-sectors-to-household).

Budget: Total eligible costs: €7,737,750
Requested EU contribution (max grant): €6,929,925

Individual Flagship

Flagship name: MASE EOS - Eco-design for sustainable and recyclable

Field/industry targeted: ICT/Electronics

Main topic: Digital Product Passport and carbon footprint monitoring

Status: Submitted, pending approval

Smart Circuit PPs involved: PP6/SIIT

External DIHs/ Industry Digital Centres involved: EDIH CETMA DIHSME

The results the flagship builds upon, TF services or pilot results (DT3.2 / DT3.3): Waste reduction, Digital Product Passport

Targeted funding opportunity - source of funding: MASE (Ministry of Environment)

Duration: 01.01.2026 - 31.12.2026

Short description: Use of innovative materials (highly recyclable or involving innovative processes) to build wind turbine blades, manage their recycling to reuse the materials both to make other wind turbine blades and in other supply chains such as the construction or space sectors.

Budget: 4.400.000 EURO

Useful links: here

Individual Flagship

Flagship name: CIRC2Zero - Driving Collaborative Innovation towards Decarbonization and Advanced Manufacturing in SMEs across the Baltic Sea Region

Field/industry targeted: ICT/ Electronics, Construction

Main topic: Digital transformation of SME

Status: Approved

Smart Circuit PPs involved: LP1/KPT

External DIHs/ Industry Digital Centres/ other organizations involved: Linna Business Development – Finland, Tallinn University of Technology – Estonia, Tallinn Science Park Tehnopol – Estonia, K8 Institute for Strategic Aesthetics – Germany, Academy of Fine Arts Saar – Germany, Riga Technical University – Latvia, Business Union of Latvia – Latvia, Luleå University of Technology – Sweden, VMG Lignum Systems – Lithuania, "VIZULO" Ltd. – Latvia, Industriellt Utvecklingscentrum Norr AB – Swedena nd associated partners (regional authorities).

The results the flagship builds upon, TF services or pilot results (DT3.2 / DT3.3): Test before invest (digital twin), trainings and skill development and a tailored program of webinars and workshops focused on Digital Twin technology in the electronics sector. Furthermore, advanced simulations enable the optimization of value chains, leading to reduced raw material consumption and improved logistical efficiency.

Targeted funding opportunity - source of funding: Interreg Baltic Sea

Duration: 01.03.2025 – 29.02.2028

Short description: The project's goal is to support small and medium-sized enterprises (SMEs) in the Baltic Sea Region (BSR) in their decarbonization process and enhance their ability to adopt modern manufacturing technologies in the in their decarbonization process and enhance their ability to adopt modern manufacturing technologies in the wood and electronics sectors. The project helps companies develop more sustainable and advanced processes, contributing to environmental responsibility and improving their market competitiveness. A key element of the project is the development and implementation of a Digital

Twin platform, enabling businesses to simulate and optimize their production processes. As a result, the project will directly educate entrepreneurs on circular solutions, resource utilization, and sustainable practices. This initiative will also engage regional authorities, facilitating knowledge exchange and co-creation activities at the international level.

Budget: 3.296.687 EUR

Long-term uptake of the service portfolios

After the project ends, PPs plan to adopt the following services from the Electronics service portfolio and offer them to their ecosystem as support to enable digitally driven circularity:
LP1/KPT: Test before invest (digital twin), trainings and skill development and a tailored program of webinars and workshops focused on Digital Twin technology in the electronics sector. Furthermore, advanced simulations enable the optimization of value chains, leading to reduced raw material consumption and improved logistical efficiency.

PP2/FB: Promoting sustainable consumption will be the focus of future projects, building on the success of previous initiatives. Digital twins will also be a key component of these projects and projects aiming at enhancing resource efficiency.PP5/mtSW: microTEC Südwest will provide trainings with a mix of knowledge transfer and best practice parts, e.g. as part of the microTEC SkillsLab project.

PP6/SIIT: Through their DIHs, SIIT Ligurian Technological District Integrated Intelligent Systems offers the maturity assessment; extends it toward an environment assessment. In the future, based on results, it is consideed to customize parts of CIA modules for DIHs/users.

PP7/COMET: through its EDIHs COMET will provide a living lab facility to test before invest digital and advanced manufacturing technologies like robotics, AI-integrated systems, and digital twins in a risk-free environment.

PP8/TECOS: TECOS will continue providing the “Fast Prototyping and Development of Circular Products” service as a permanent Test-Before-Invest offer for ICT/electronics SMEs within DIH INDUSTRY. The service will include rapid prototyping/rapid tooling, reverse engineering where relevant, validation of bio-based/recycled materials for housings and components, and practical guidance for design-for-repair and design-for-disassembly. In parallel, TECOS will actively explore follow-up initiatives and joint applications with Smart Circuit partners and other DIHs/EDIHs to scale the uptake and market readiness of the flagship solutions.

PP9/PBN: PBN will integrate the ICT/Electronics service portfolio into its digital innovation ecosystem and SME support activities, including workshops, matchmaking events and technology demonstrations. The knowledge generated in the project will also support the uptake of the SPIRAL flagship initiative, helping SMEs explore circular manufacturing, digital product lifecycle management and remanufacturing opportunities in the electronics sector.

PP10/TUKE: TUKE will continue offering trainings and expert consultation services focusing on digital and circular assessments and innovation piloting and scaling up for industry, and will continue in preparation and implementation of innovation projects supporting the industry and society in digital and circular transition, especially in the domains of monitoring of waste flows, assistance in improvement of operations and delivering the environmental impacts improvement.

PP11/INTEMAC: To ensure the continuity and long-term impact of the results achieved within the electronics sector service portfolio, we will place a strong emphasis on fostering sustainable consumption in upcoming projects. Building on previous successes, we will further integrate digital twins as a core element of our approach, particularly in initiatives aimed at increasing resource efficiency and optimizing the use of materials and energy.

3.4. Cross-sectoral Flagship Solution Model

This section outlines the Cross-sectoral Flagship Solution Model, starting with an analysis of the main feedback on the challenges faced by SMEs from different sectors from 9 EU countries. This analysis led to the development of a decision-making matrix for selecting the most suitable technologies to address the identified challenges, which in turn informed the development of Cross-sectoral Service Portfolios. These portfolios were tested through the FACTORY pilots and culminated in a final Flagship Project that ensures the continued transfer of knowledge and best practices through new initiatives.

Figure 7 Cross-sectoral Flagship Solution Model (source: Author generated, 2025)

The Transnational Solution, which addresses the challenges in the Cross-sectoral sector, has been created by combining the results of the Piloted solutions and the service portfolios delivered by the Task Force. This solution provides a digitally driven roadmap for the circular transformation applicable for different manufacturing sectors:

Phase 1: Capacity Building, Skills Development and Circular Roadmapping

This category addresses the early stages of circular transition, where companies require structured guidance, skills development, and clarity on regulatory and strategic requirements. It builds on pilots focused on training, diagnostics, ESG readiness, eco-design, and sustainability communication.

Step 1: Needs identification and baseline diagnostics

Companies get the support with structured assessments of sustainability, ESG readiness, and circular maturity (e.g. ESG audits, VSME and CSRD readiness checks, simplified LCA screenings, and co-developed diagnostic tools).

Step 2: Targeted training and skills development

Based on identified gaps, SMEs get the focused training on ESG reporting, EU regulatory frameworks, circular economy principles (including 6R), eco-design, sustainability marketing, climate neutrality, and similar topics. Training formats combine workshops, practical examples, and peer exchange across sectors.

Step 3: Roadmapping and strategy definition

Companies get the support to translate assessment results into concrete roadmaps, defining priorities for circular business models, product redesign, reporting obligations, and internal capacity development. Eco-design strategies, ESG action plans, and sustainability communication guidelines are formalized at this stage.

Step 4: Communication and internal alignment

Support is provided to prepare clear and credible sustainability communication, particularly product-level environmental information, traceability elements, and circular service options. This ensures internal understanding and prepares companies for customer and market-facing communication.

Challenges addressed:

Regulatory Environment and Compliance, Lack of Qualified Workforce and Training, Environmental Challenges, Customers Awareness and Preferences, Competitiveness.

Phase 2: Networking, Matchmaking and Project Initiation

This category helps companies transition from individual readiness to collaborative action. The focus is on building trust, enabling cooperation and initiating concrete circular projects across value chains and sectors.

Step 1: Structured networking and facilitated exchange

SMEs are brought together through moderated meetings, workshops, and company visits. These settings allow participants to present challenges, exchange practices, and explore synergies across sectors such as manufacturing, construction, energy, food, and ICT.

Step 2: Expert matchmaking and knowledge transfer

Companies are connected with research organizations, technology providers, DIHs and other SMEs. Their areas of expertise include materials, plastics, composites, energy systems, digital tools, circular process design, etc.

Step 3: Project scoping and initiation

Identified collaboration opportunities are translated into concrete project ideas, circular value chains or pilot initiatives. This involves defining shared objectives, outlining resource requirements and pinpointing digitisation or automation enablers.

Step 4: Embedding continuity through clusters and hubs

To ensure follow-up, replication, and long-term cooperation beyond individual meetings, networking activities are integrated in existing structures such as clusters, innovation hubs, and EDIHs.

Challenges addressed:

Lack of Cooperation, Sustainable Supply-Chain Management, Market Dynamics, Financial Challenges, and Competitiveness.

Phase 3: Digital Tools for Monitoring, Assessment and Decision Support

This category focuses on supporting SMEs with practical digital tools that translate sustainability and circularity goals into measurable insights. The emphasis is on assessment, monitoring, and data-driven prioritization rather than full-scale automation.

Step 1: Introduction of accessible assessment tools

SMEs apply lightweight digital tools such as circular and digital maturity assessments, simplified LCA tools, and ESG diagnostics to identify gaps and opportunities.

Step 2: Linking assessments to learning and services

Assessment results are directly connected to tailored training modules, advisory services, and DIH service catalogues, covering topics such as circular business models, impact management, IoT, AI, BIM, digital twins, etc.

Step 3: Data visualization and sustainability dashboards

Companies are supported in visualizing key sustainability indicators through dashboards and basic data pipelines, enabling clearer internal decision-making and prioritization of actions.

Step 4: Preparation for compliance and reporting

Tools and guidance help companies prepare for regulatory requirements and future reporting by structuring data, clarifying indicators, and improving understanding of environmental and digital performance.

Challenges addressed:

Technology Dynamics, Adoption and Risks, Regulatory Environment and Compliance, Sustainable Resource Management, Environmental Challenges and Financial Challenges.

Phase 4: Testing and Validation of Advanced Technologies Before Investment

This category enables companies to experiment with advanced digital and manufacturing technologies in controlled environments, reducing investment risks and supporting informed decision-making before full deployment.

Step 1: Test-before-invest environments and prototyping

SMEs get the support to test solutions such as energy and environmental monitoring platforms, modular tooling concepts, rapid prototyping methods, and digital twin-ready design tools, etc. without large upfront investments.

Step 2: Integration of digital and circular functionalities

Tested solutions combine digitalization with circular objectives, including energy and resource monitoring, automated material calculations, waste reduction, traceability, and preparation for environmental reporting.

Step 3: Operational validation and skills transfer

During testing phases, employees receive targeted training to ensure the practical usability of new tools and systems, reduce resistance to change, and build internal capacity.

Step 4: Decision support for scaling and implementation

Based on testing results, companies assess cost-benefit ratios, environmental gains, and operational impacts, supporting informed decisions on scaling, further investment, or adaptation.

Challenges addressed:

Technology Dynamics, Adoption and Risks, Financial Challenges, Sustainable Resource Management, Environmental Challenges and Competitiveness.

The Flagship Solution Model has been created to bring the Transnational Solution to the market and expand it to new regions and organizations. The cross-sectoral solution model differs from sector-specific ones. Each PP contributes to the cross-sectoral Flagship by: (1) submitting projects during the Smart Circuit project duration, building on the knowledge and results gathered within the project, or (2) transferring the knowledge and results of Smart Circuit to other ongoing projects.

To ensure knowledge exchange and cooperation, PPs will continue meeting after the project ends, once per year, bringing knowledge and results from other projects, capitalizing on Smart Circuit results and creating a baseline for the submission of new projects. PPs will meet annually for five years after the project ends. During each meeting, PPs will discuss their current topics of interest, share knowledge and resources gathered in other projects, invite each other to events and conferences, and participate in ideation workshops that will help them build consortia for new projects, especially for the next programme period.

Each year, one of the WP/WS leaders will be responsible for scheduling and facilitating the meeting, creating a structure for online brainstorming and information exchange. **Year 2027: KPT; Year 2028: mtSW; Year 2029: TUKE; Year 2030: TECOS; Year 2031: PBN.**

All PPs confirm their participation and commit to these meetings by signing LoCs (more details in Section 4). All PPs agree on the most suitable period/month for these meetings, and each year the meeting should be held in the same month. KPT is responsible for ensuring that these meetings are organized. PPs may also invite associated partners or other organizations to join these meetings in order to extend partnerships and potential consortia for new projects.

PPs will bring knowledge from the following cross-sectoral projects:

LP1/KPT

Flagship name: EDIH #2

Description: Enhancement and professionalization of services provided by the EDIH, including the integration of solutions developed and validated through Task Forces and pilot projects within SMART CIRCUIT.

Duration: 01.10.2026 – 30.09.2029

Funding source: Digital Europe

Status: Approved

PP2/FB

Flagship name: REUSE

Description: The main objective of the REUSE project is to increase skills and knowledge through a cross-border mentoring program that aims to increase the use of technological and non-technological solutions for introducing the cascade use model for residual raw materials from production processes.

Duration: 01.11.2023 – 31.10.2026

Funding source: EFRE SI-AT

Status: Ongoing

PP3/PRO

Flagship name: EDIH AI5innovation

Description: AI5innovation is a forward-looking initiative focused on turning cutting-edge AI into practical, real-world solutions. It brings together technology, creativity, and business expertise to help organizations explore, build, and scale AI-driven products—responsibly, securely, and with measurable impact.

Duration: 01.11.2025 - 31.10.2028

Funding source: EU, Federal Ministry of Economy, Energy and Tourism

Status: Ongoing

PP4/IWU

Flagship name: CIRCULAR SAXONY (second period)

Description: To establish a circular economy in Saxony, the CIRCULAR SAXONY innovation cluster, which is funded by the Free State of Saxony, has been initiated. The aim is to design the entire value chain of products and services in a sustainable manner in order to address resource issues and reduce the costs of transitioning to climate neutrality. Together with stakeholders from industry, science, and politics, the circular economy is to be translated from rhetoric into practice within the framework of topic-specific working groups.

Duration: 15.03.2026-14.03.2032

Funding source: SAB - Sächsische Aufbaubank

Status: Pending approval

PP5/mtSW

Flagship name: microTEC SkillsLab (re-named from Microtec Academy)

Description: This project aims to develop and test training measures, particularly for different target groups from microelectronics/microsystems technology-related organizations. Technological focal points include digitalization, AI, Industry 4.0, robotics, photonics and quantum technologies. The application scenarios address resource efficiency, energy transition, advanced production technology or the circular economy as well as the healthcare industry.

Duration: 16.07.2025 – 30.09.2028

Funding source: EFRE BW

Status: Ongoing

PP6/SIIT

Flagship name: CISUTAC

Description: CISUTAC aims to remove current bottlenecks in order to increase textile circularity in Europe. The objective is to minimise the sector's total environmental impact by developing sustainable, novel, and inclusive large-scale European value chains. CISUTAC covers a relevant part of the textile sector and shows how to close loops at product and at material level.

Duration: 01.09.2022 – 30.09.2026

Funding source: Horizon Europe

Status: Ongoing

PP7/COMET

Flagship name: RE-INCITE

Description: RE-INCITE tackles the challenge of establishing and implementing circular economy practices in the Alpine region. The project aims to create a new cross-sectorial and cross-border governance nucleus that might serve as a new role model connecting clusters and municipalities. It helps regional public authorities to implement (macro)-regional CE strategies.

Duration: 24 months (01.01.2025 - 31.12.2026)

Funding source: Interreg Alpine Space

Status: Ongoing

PP8/TECOS

Flagship name: ADDCIRCLES

Description: The main goal of the ADDCIRCLES project is to empower regional businesses and networks for additive manufacturing (AM). The project aims to promote the implementation of AM in a way that improves resource efficiency in production, while also encouraging recycling and the use of natural materials. This goal will be achieved through the establishment of cross-border value chain cooperation networks and two pilot projects that facilitate knowledge transfer at various stakeholder levels.

Duration: 01.11.2023 – 31.10.2026

Funding source: Interreg SI-AT

Status: Ongoing

PP9/PBN

Flagship name: INNOSKILLS-CE

Description: This project focuses on supporting the manufacturing sector in Central Europe through skills development, training strategies and pilot actions. It brings together organisations from Italy, Hungary and Poland to address labour-market needs, improve digital and innovation-related competencies, and test new training solutions for SMEs. PBN contributes by developing learning management systems, training modules and supporting pilot testing.

Duration: 01.02.2025 – 31.01.2027

Funding source: Intereg CE

Status: Ongoing

PP10/TUKE

Flagship name: REUSE2030

Description: The REUSE2030 project analyses current waste streams and circular practices in the mechanical sector. This leads to a new digital circular inventory, which empowers mechanical companies to autonomously choose sustainable practices. The inventory is complemented by a newly developed zero carbon toolkit. Both tools are tested in companies and inform a new strategy with circular solutions to reduce the mechanical sector's waste streams.

Duration: June 2024 – November 2026

Funding source: Interreg CE

Status: Ongoing

PP11/INTEMAC

Flagship name: CROSS-IN

Description: CROSS-IN applies a downstream capitalisation and policy-uptake approach, transferring results from five Interreg projects to strengthen innovation capacities in the automotive and mobility ecosystem.

In line with EU competitiveness recommendations, the project acts as a “twin-transition accelerator”, translating European R&D assets into SME practice. Its ecosystem approach connects SMEs, OEMs, clusters, research and creative industries into a learning community. CROSS-IN strengthens innovation capacities, improves transformation readiness and creates long-term linkages across Central Europe. SMEs benefit from accessible tools, creative training formats and a trusted expert network that remains active beyond the project’s lifetime. By embedding all results into the CROSS-IN Transformation Platform, the project ensures that knowledge and success stories remain openly available. Transnational cooperation is at the heart of CROSS-IN – enabling regions to benchmark automation maturity, share solutions and jointly bridge the innovation gap between industrial centres and border regions.

Duration: 24 months

Funding source: Interreg CE

Status: Pending approval

PP12/HGK

Flagship name: CE-PACT

Description: CE-PACT aims to raise awareness and build policymakers' capacities to enhance circular economy policy frameworks and support measures across 6 CE regions. By adapting and uptaking solutions, action plans, and strategies from Interreg (3 CE & 2 CBC) projects, it drives a coordinated policy boost for circularity while reducing regional disparities. As a result, innovation actors (SMEs, RTOs, etc.) are empowered by policy to develop circular solutions and value chains, driving a greener, more resilient CE.

Duration: October 2026 – September 2028

Funding source: Interreg CE

Status: Pending approval

Long-term uptake of the service portfolios

After the project ends, PPs plan to adopt the following services from the Cross-sectoral service portfolio and offer them to their ecosystem as support to enable digitally driven circularity:

LP1/KPT: The topics and services developed by the Task Force will be integrated into hub4industry service portfolio; however, they will be adapted to align with the EDIH's production focus. Thanks to the Smart Circuit projekt and pilots 2 specific services were included under portfolio. 1st service offering workshop to train SME employees to implement Industry 4.0 solutions aligned with Circular Economy principles and ESG reporting requirements. The program focuses on identifying specific green innovation opportunities within the enterprise to enhance sustainability. Participants gain the practical skills needed to integrate advanced technologies with eco-friendly business strategies. 2nd service is a comprehensive audit and a strategic roadmap to transition from linear to circular business models. It focuses on redesigning core processes by integrating modern Industry 4.0 technologies to drive sustainable growth. The final output is a tailored transformation concept that aligns future operations with circular economy principles.

PP2/FB: Following the conclusion of the project, the services circular, consumption and behavioural change will be continued at FB. The same will apply to the repair, reuse and second life services.

PP3/PRO: The topics and services developed by the Task Force will be integrated into AI5innovation's service portfolio; however, they will be adapted to align with the EDIH's production focus.

PP4/IWU: IWU will transfer the knowledge and collected experiences of the cross-sectoral pilot back to the innovation cluster Circular Saxony to refine and expand the range of services they will use it in their daily consulting, training and inspiration work with their members from various industries.

PP5/mtSW: microTEC Südwest will provide trainings with a mix of knowledge transfer and best practice parts, e.g. as part of the microTEC SkillsLab project.

PP6/SIIT: SIIT foresees using the cross-sectoral pilot as the baseline for developing the official Sustainability Maturity Assessment of DIH Liguria, ensuring continuity and long-term impact.

PP7/COMET: COMET will keep providing also by leveraging on the competences of its partner and main shareholder Polo Tecnologico Alto Adriatico ESG audits aimed at assessing environmental, social and governance criteria, enhancing sustainability practices and regulatory compliance.

PP8/TECOS: TECOS will keep the cross-sectoral prototyping and circular product development service available to SMEs beyond the three main value chains, providing quick feasibility checks, prototype validation and actionable circular design recommendations (resource efficiency, durability, repairability, disassembly). The service will be embedded in DIH INDUSTRY as a practical **Test-Before-Invest** environment and promoted via relevant national networks to support broader replication of the Factory approach.

PP9/PBN: PBN will transfer the cross-sectoral knowledge and circular innovation approaches developed within SMART CIRCUIT to the INNOSKILLS-CE project, integrating them into training modules and pilot learning activities for manufacturing SMEs. Through its digital innovation ecosystem and regional stakeholder

network, PBN will further promote skills development and knowledge exchange supporting circular and digital transformation across multiple manufacturing sectors.

PP10/TUKE: TUKE will continue offering tranings and expert consultation services focusing on digital and circular assessments and innovation piloting and scaling up for industry, and will continue in preparation and implementation of innovation projects supporting the industry and society in digital and circular transition, especially in the domains digital and circular skills development and circular roadmapping; Networking, matchmaking and project initiations; Digital tools for monitoring, assessment and decision support.

PP11/INTEMAC: The topics and services developed by the Task Force are expected to be reflected in the EDIH DIGIMAT service portfolio, as they build on existing EDIH activities. Where relevant, they may be further adjusted to better correspond with the EDIH's production-oriented focus.

PP12/HGK: HGK VZ, linking companies, academia and the policy level, will continue to support the adoption of circular economy principles in the business sector and to provide cross-sectoral services aimed at helping companies improve their environmental performance.

3.4.1. Kick-Off of the Cross-sectoral exchange

PP2/FB will organize a workshop during the in-person PP meeting in March in Slovenia, where PPs will discuss how they want to proceed with these yearly exchanges. During the workshop, PPs will agree on the following:

- The dates they want to have these exchanges in the next five years (or at least the starting date)
- The structure of the workshop they want to have
- Whom they want to involve (ASPs, other colleagues, etc.)
- The content of the workshop
- The tools and communication channels PPs want to use

Also, during the kick-off workshop in March and other upcoming online exchanges, PPs will continue identifying their topics of interest based on the Excel table created by FB and continue mapping funding opportunities. Based on this information, PPs will be matched and split into break-out rooms during the online workshops or teams during the in-person workshop in March to discuss the topics of interest.

This will allow partners to form new partnerships and project ideas and prepare the baseline for upcoming calls, as well as for the new term.

Finally, during these exchanges, PPs should also bring knowledge and experience from identified cross-sectoral Flagship projects, ensuring knowledge exchange, and the possibility to build new projects on already existing results.

4. Ensuring Long-Term Sustainability

This section reflects the approach of the consortium to ensure the long-term sustainability of the results created in WP3. As already demonstrated, long-term sustainability will be achieved through four transnational Flagship projects and through PPs' individual initiatives, individual Flagship projects, as well as through the uptake of the service portfolios by PPs' organizations.

To demonstrate this, PPs will sign Letters of Commitment showcasing their plans to ensure the long-term sustainability of the project's results in their regions.

Besides this, the aim is also for the results to be taken up not only by the PPs but also by Associated Partners, expanding the impact of the project.

Considering this, two types of LoCs are created:

- LoC for the Consortium
- LoC for the partnering organizations

4.1. LoC for the consortium

It has been agreed by the consortium that the commitment for the uptake and expansion of the results from all three WPs (linked with D1.4.2, D2.4.3, and D3.4.2) will be combined into one document, to reduce bureaucratic efforts and showcase the interlinks between different activities.

The LoC (see Annex 3) has been divided into three parts, one for each WP. PPs indicated their commitment for each WP, but in this deliverable the main focus will be on WP3.

The WP3 section is mainly focused on the services from the four service portfolios (Textile, Construction, ICT/Electronics, and Cross-sectoral) that PPs aim to uptake and offer to organizations in their regional ecosystems. Additionally, the section outlines PPs' commitment to participate in yearly consortium meetings in the five years following the end of the project, bringing knowledge and best practices from the projects they have identified as cross-sectoral pilots, as well as insights into key topics that their organizations are interested in and funding opportunities, laying the baseline for project development and bridging to the new term.

Signing process:

One LoC document will be created through the efforts of D1.4.2, D2.4.3, and D3.4.2, in this case PP2/FB, PP3/PRO, and PP6/SIIT, combining all inputs from PPs outlining their commitment. All PPs will sign one document in 12 copies, ensuring that each PP receives a copy, meaning that the document will be signed multilaterally.

The document will be ready by **1 February 2026**, and PPs will have time until **15 February 2026** to check the content and until **6 March 2026** to sign it. During the in-person PP meeting in Slovenia, PPs will exchange the signed documents.

All PPs should upload their LoCs here (path: WP3 -> A3.4 -> D3.4.2 -> LoCs -> LoC for the Consortium).

4.2. LoC for the partnering organizations

In addition to the Consortium LoC, PPs will also sign LoCs with their partnering organizations, Associated Partners. The aim is to ensure the uptake of the project results beyond the consortium, enabling knowledge transfer and wider impact.

Each PP is tasked with creating the content of the LoC with their ASPs, documenting which results will be taken up by the ASPs from WP1, WP2, and WP3.

The template is created (see Annex 4), allowing PPs the freedom to enter information depending on the agreement and the interests of the ASPs in specific results. ASPs can take up one result or more, and it is not mandatory to take up all of them. When it comes to WP3, ASPs can take up services from the four Transnational service portfolios (Construction, Textile, ICT/Electronics, Cross-sectoral) or commit to joining the Cross-sectoral Flagship and participating in yearly Smart Circuit consortium meetings focused on the development of new projects and opportunities.

Signing process:

The LoC document template will be created by the joint effort of partnering organizations responsible for D1.4.2, D2.4.3, and D3.4.2, in this case PP2/FB, PP3/PRO, and PP6/SIIT. Each PP will discuss with their ASPs, agree on the results they want to take up, and sign the document bilaterally.

The template (Annex 4) is created, ensuring freedom for PPs to determine its content. Some examples will be included for WP3, but PPs do not have to follow the suggested approach and can add the agreed commitments, ensuring maximized impact.

The document will be ready **by 1 February 2026** for signature, with the final deadline for PPs being **20 March 2026**.

All PPs should upload their LoCs here (path: WP3 -> A3.4 -> D3.4.2 -> LoCs -> LoC for Partnering Organizations).

The table below showcases the timeline:

Task to achieve	**Deadline**	**Responsibilities**
LoCs for the consortium created	01.02.2026	PP2/FB, PP3/PRO, PP6/SIIT
LoC template for partnering organizations ready	01.02.2026	PP2/FB, PP3/PRO, PP6/SIIT
LoC for the consortium reviewed by PPs	15.02.2026	All PPs
LoC for the consortium signed by all PPs	06.03.2026	All PPs
LoC for the consortium exchanged	13.03.2026	LP1/KPT
LoC for the partnering organizations signed by PPs and ASPs	20.03.2026	All PPs

Conclusion and Next Steps

1. Conclusion

The purpose of this document is to report on the activities of PPs that led to the delivery of the Transnational Solution for the FACTORY with four Flagship Solution Models, to present the Solution, and to explain how PPs aim to ensure the long-term sustainability of the WP3 results. The report showcases:

- The interlinks between different project activities that have led to the development of the Transnational Solution for the FACTORY with four Flagship Solution Models.
- The process for the delivery of four Transnational Flagship Projects.
- An overview of the Transnational Solution with four Transnational Flagship Projects.
- The pathway towards ensuring long-term sustainability through LoCs.

The document has provided critical background knowledge about the project and the key steps for above-mentioned activities.

2. Next Steps

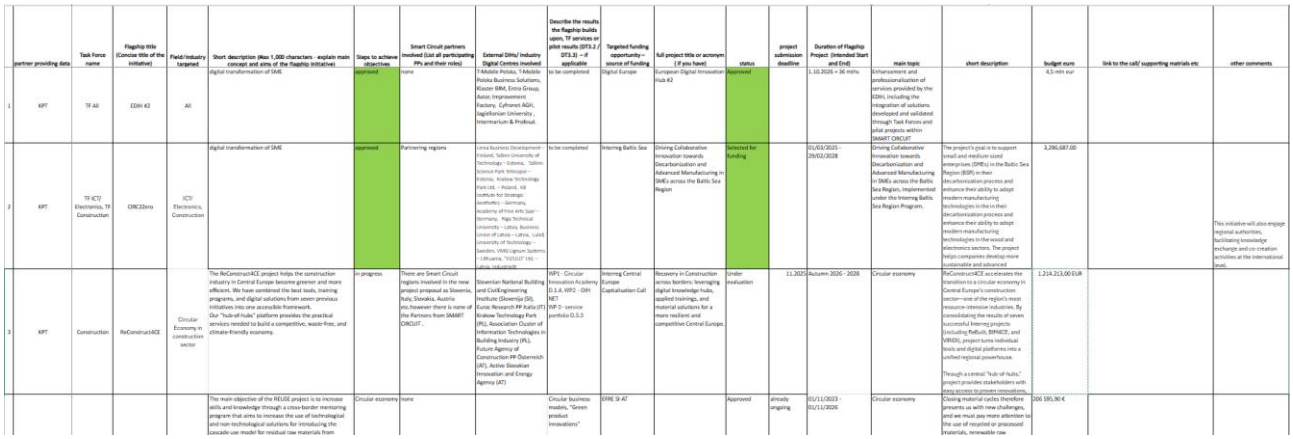
This section outlines all the necessary steps to successfully establish a long-term CIA Solution concept.

Task to achieve	**Deadline**	**Responsibilities (RACI methodology)**
LoCs for the consortium created	01.02.2026	R: PP2/FB (WP1, WP3), PP3/PRO, PP6/SIIT (WP2); A: PP2/FB (WP1, WP3), PP3/PRO, PP6/SIIT (WP2); C: All PPs
LoC template for partnering organizations ready	01.02.2026	R: PP2/FB (WP1, WP3), PP3/PRO, PP6/SIIT (WP2); A: PP2/FB (WP1, WP3), PP3/PRO, PP6/SIIT (WP2); C: All PPs
Draft version of the report ready for the review by the consortium	15.02.2026	R: PP2/FB; A: PP2/FB; C: LP1/KPT; PP8/TECOS
LoC for the consortium reviewed by PPs	15.02.2026	R: All PPs; A: PP2/FB (WP1, WP3), PP3/PRO, PP6/SIIT (WP2);
PPs review the report and send their feedback	06.03.2026	R: All PPs; A: PP2/FB
LoC for the consortium signed by all PPs	06.03.2026	R: All PPs; A: PP2/FB (WP1, WP3), PP3/PRO, PP6/SIIT (WP2);
LoC for the consortium exchanged	13.03.2026	R: All PPs; A: LP1/KPT
LoC for the partnering organizations signed by PPs and ASPs	20.03.2026	R: All PPs; A: PP2/FB (WP1, WP3), PP3/PRO, PP6/SIIT (WP2);
FB integrates the signed LoCs and PPs feedback into the report	23.03.2026	R: PP2/FB; A: PP2/FB
The final version of D3.4.2 ready	25.03.2026	R: PP2/FB; A: PP2/FB

D. Annexes

Annex 1 – Flagship Monitoring Table

This annex showcases the table that has been used by PPs to identify and describe four Transnational Flagship Projects and individual Flagship Projects. It was created by PP8/TECOS within D3.4.1. It can be found here.



	partner providing data	Task Force name	Flagship title (Concise title of the initiative)	Field/industry targeted	Short description (Max 1,000 characters - explain main concept and aims of the flagship initiative)	Steps to achieve objectives	Smart Circuit partners involved (List all participating PPs and their roles)	External DIHs/ Industry Digital Centres involved	Describe the results the flagship builds upon, TF services or pilot results (DT3.3 / DT3.3) – if applicable	Targeted funding opportunity – source of funding	full project title or acronym (if you have)	status	project submission deadline	Duration of Flagship Project (intended Start and End)	main topic	short description	budget euro	link to the call/ supporting matrials etc	other comments
1	KPT	TF All	EDIH #2	All	digital transformation of SME	approved	none	T-Mobile Polska, T-Mobile Polska Business Solutions, Kloster BIM, Emma Group, Aston Improvement Factory, Cyfronet AGH, Jagiellonian University, Intermarium & Profeual.	to be completed	Digital Europe	European Digital Innovation Hub #2	Approved		1.10.2026 + 36 mths.	Enhancement and professionalisation of services provided by the EDIH, including the integration of solutions developed and validated through Task Forces and pilot projects within SMART CIRCUIT		4,5 mln eur		
2	KPT	TF ICT/ Electronics, TF Construction	CIRC2Zero	ICT/ Electronics, Construction	digital transformation of SME	approved	Partnering regions	Uma Business Development Finland, Tallinn University of Technology – Estonia, Tallinn Science Park Tehnopol – Estonia, Krakow Technology Park Ltd. – Poland, Kit Institute for Strategic Aesthetics – Germany, Academy of Fine Arts Saar – Germany, Riga Technical University – Latvia, Business Union of Latvia – Latvia, Lulea University of Technology – Sweden, VMG Ligetum Systems – Lithuania, "VIZIUO" Ltd. – Latvia, Industrial	to be completed	Interreg Baltic Sea	Driving Collaborative Innovation towards Decarbonization and Advanced Manufacturing in SMEs across the Baltic Sea Region	Selected for funding		01/03/2025 - 28/02/2028	Driving Collaborative Innovation towards Decarbonization and Advanced Manufacturing in SMEs across the Baltic Sea Region, implemented under the Interreg Baltic Sea Region Program.	The project's goal is to support small and medium-sized enterprises (SMEs) in the Baltic Sea Region (BSR) in their decarbonization process and enhance their ability to adopt modern manufacturing technologies in the in their decarbonization process and enhance their ability to adopt modern manufacturing technologies in the wood and electronics sectors. The project helps companies develop more sustainable and advanced	3,396,687.00		This initiative will also engage regional authorities, facilitating knowledge exchange and co-creation activities at the international level.
3	KPT	Construction	ReConstruct4CE	Circular Economy in construction sector	The ReConstruct4CE project helps the construction industry in Central Europe become greener and more efficient. We have combined the best tools, training programs, and digital solutions from seven previous initiatives into one accessible framework. Our "hub-of-hubs" platform provides the practical services needed to build a competitive, waste-free, and climate-friendly economy.	in progress	There are Smart Circuit regions involved in the new project proposal as Slovenia, Italy, Slovakia, Austria etc.however there is none of the Partners from SMART CIRCUIT .	Bavarian National Building and Civil Engineering Institute (Slovenija (SI), Eurac Research PP Italia (IT) Krakow Technology Park (PL), Association Cluster of Information Technologies in Building Industry (PL), Future Agency of Construction PP Österreich (AT), Active Slovakian Innovation and Energy Agency (AT)	WP1 - Circular Innovation Academy (L2.4, WP2 - DIH NET (DP 7 - service portfolio O.3.3	Interreg Central Europe Capitalisation Call	Recovery in Construction across borders: leveraging digital knowledge hubs, applied trainings, and material solutions for a more resilient and competitive Central Europe.	Under evaluation	11.2025	Autumn 2026 - 2028	Circular economy	ReConstruct4CE accelerates the transition to a circular economy in Central Europe's construction sector—one of the region's most resource-intensive industries. By consolidating the results of seven successful Interreg projects (including ReBuilt, BIM4CE, and VIRIDIS), project turns individual tools and digital platforms into a unified regional powerhouse. Through a central "hub-of-hubs," project provides stakeholders with easy access to proven innovations,	1,214,213.00 EUR		
					The main objective of the REUSE project is to increase skills and knowledge through a cross-border mentoring program that aims to increase the use of technological and non-technological solutions for introducing the cascade use model for residual raw materials from	Circular economy	none		Circular business models, "Green product innovations"	ERNE 9-AT		Approved	already ongoing	01/11/2023 - 01/11/2026	Circular economy	Closing material cycles therefore presents us with new challenges, and we must pay more attention to the use of recycled or processed materials, renewable raw	206 595,90 €		

Annex 2 – Future Flagships Identification Table

This annex showcases the table that has been used by PPs during one of the workshops to identify the topics of common interest and brainstorm on potential project ideas. This approach will serve as a baseline for the yearly PPs meetings after the project ends. It was created by PP2/FB. It can be found here.

Project Partner	Construction	Artificial Intelligence	Electronics	Textiles	Circular Economy Topics in General	Communication of Circular Economy	Robotics	Smart Materials	Manufacturing Processes	Additive Manufacturing	Healthcare	Data Analytics	Water	Green Marketing	Wood se
FB	Yes	Yes	Yes	Maybe	Yes	Yes	Maybe	Maybe	Maybe	Maybe	Maybe	Yes	Maybe	Yes	Maybe
KPT	Yes	Yes	Yes	No	Yes	Yes	No	Maybe	Maybe	Maybe	No	Maybe	No	Maybe	No
Pro															
IWU	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No
mTSW	No	Yes	Yes	Yes	Maybe	Maybe	Maybe	Maybe	Yes	Yes	Yes	Maybe	No	No	No
SIIT	Maybe	Yes	Maybe	Maybe	Maybe	Maybe	Yes	Yes	Yes	Yes	No	No	Yes	No	No
COMET	No	Yes	Maybe	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	Maybe	No
TECOS	Maybe	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Maybe	No	Yes	No
PBN	Maybe	Yes	Yes	Maybe	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
TUKE	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Maybe	Yes	Yes
INTEMAC	Maybe	Yes	Yes	No	Yes	Maybe	Yes	Maybe	Yes	Yes	No	Maybe	No	No	No
HGK	Yes	Yes	Maybe	Yes	Yes	Yes	Maybe	Yes	Yes	Maybe	Maybe	Maybe	No	Yes	Maybe

Annex 3 - LoC for the Consortium

This section showcases the Letter of Commitment signed by all PPs. The main aim of the document is to showcase PPs' commitment to ensuring the long-term sustainability of the project's results. The template can be found here. PPs have to upload the signed letters by 6 March 2026 here.

1. Objective of the Letter of Commitment

The objective of SMART CIRCUIT is to promote the role of the DIH network and its actors in accelerating the adoption of a digital/tech-driven circular economy, enabling a resource-efficient and competitive transition in CE manufacturing. To achieve this, project partners fostered three transnational solution systems: WP1 - the Circular Innovation Academy (CIA); WP2 - the Circular Industry Strategy Lab (STRATLAB); and WP3 - the Circular Industry Factory (FACTORY). These systems bring benefits to multiple stakeholders (enterprises, policymakers, RTOs, BSOs, etc.) and deliver a transnational approach at the intersection of digital, RIS3 and circular economy strategies.

This Letter of Commitment (hereinafter referred to as Letter or LoC) serves to outline the commitment of project partners (PP) to ensure the integration and transfer of the three transnational solution systems (CIA, STRATLAB, FACTORY), to support their long-term sustainability, and to maintain continuous cooperation with the Smart Circuit consortium after the completion of the project.

By signing this Letter, **the fill consortium** commits to ensuring the long-term sustainability of (1) the WP1 Circular Innovation Academy for ongoing upskilling of professionals in a pan-EU context (linked to D1.4.2); (2) the WP2 transnational solution method for policy-industry engagement via the Circular and RIS3 Strategy Lab (linked to D2.4.3); and (3) the WP3 transnational solution on the Factory, including the next steps to bring four Flagship Solution Models to the market (linked to D3.4.2).

2. Scope and goals of LoC

To ensure the long-term sustainability of the three Smart Circuit solution systems, **Project Partner** commit:

- In relation to the WP1 Circular Innovation Academy (CIA) for ongoing upskilling of professionals in a pan-EU context (linked to D1.4.2) to:
    - LP1/KPT: B2Green Project PPT Presentation, Task Force by European Network of Living Labs. EU circular innovation Academy? Translate some of the modules into Polish and offer them locally.
    - PP2/FB: Keep the Moodle platform running for at least 5 years
    - PP3/PRO : a link to the Moodle platform will be provided on the EDIH AI5innovation Webpage, which will be shown in the section of International Networks & Collaborations within AI5innovation (Networking | AI5innovation). FB continues to keep the Moodle platform running.
    - PP4/IWU: contact to universities / maybe there is the possibility to find connections to advertise them / updating difficult
    - PP5/mtSW: EFRE project of mTSW (project accepted); exact way to use content to be defined, e.g. translating the Electronics Module into German and using it as a base for a new regional project.
    - PP6/SIIT: Their digital innovation hubs offer the maturity assessment and as part of our pilot activities we are helping the digital innovation hubs in extending their maturity assessment into an environment assessment and based on the results of the assessment they can customize some part of the modules within the CIA
    - PP7/COMET: Promotion to RE-INCITE and BeSoGreat project partners. Eventually available to create from scratch a new "module" more linked to our industry (Mechanical engineering / injection moulding). Also dependings on the follow up projects.
    - PP8/TECOS: Can be linked to CIRCOTRONIC I need to CIRCOTRONIC coordinator how
    - PP9/PBN: Explore integration of selected CIA modules into the PBN Digital Innovation Hub services, especially those related to the current activity of the DIH. Module 3 & 4 (but of course all) / updating dependings on the follow up projects

Annex 4 – LoC for the Partnering Organizations

This section showcases the Letters of Commitment signed by PPs and their partnering organizations (bilaterally). The main aim of the document is to showcase the transfer and uptake of the project results by new organizations.

PPs have to upload the signed letters by 20 March 2026 here.

1. Objective of the Letter of Commitment

The objective of SMART CIRCUIT is to promote the role of the DIH network and its actors in accelerating the adoption of a digital/tech-driven circular economy, enabling a resource-efficient and competitive transition in CE manufacturing. To achieve this, project partners fostered three transnational solution systems: WP1 - the Circular Innovation Academy (CIA); WP2 - the Circular Industry Strategy Lab (STRATLAB); and WP3 - the Circular Industry Factory (FACTORY). These systems bring benefits to multiple stakeholders (enterprises, policymakers, RTOs, BSOs, etc.) and deliver a transnational approach at the intersection of digital, RIS3 and circular economy strategies.

The objective of this letter is to formalize the relationship between [name of the PP] and the [name of the partnering organization] regarding the follow-up steps to ensure the project results (CIA, STRATLAB and FACTORY) long-term sustainability through collaboration and knowledge transfer.

2. Scope and goals of LoC

1. In relation to the WP1 Circular Innovation Academy (CIA) for ongoing upskilling of professionals in a pan-EU context, [name of the partnering organization] commits to:
    - Promote the CIA on their social media channels and make it available on their website.
    - Promote the CIA on the websites of their associated Digital Innovation Hubs.
    - Offer the CIA as internal training for the employees in their organization.
    - Establish connections between the CIA and other relevant platforms (how, which platforms, which Modules)
2. In relation to the WP2 transnational solution method for policy-industry engagement via the Circular and RIS3 Strategy Lab, [name of the partnering organization] commits to:
    - Add
    - Add
    - Add
3. In relation to the the WP3 transnational solution on the Factory, including the next steps to bring four Flagship Solution Models to the market, [name of the partnering organization] commits to:
    - Learn form and/or uptake the following services from the D3.1.3 Service Portfolios and D3.3.3 Piloted Solutions into their offer or to their ecosystem: name the services
    - Participate in the cross-sectoral Flagship with the entire consortium, consisting of **yearly meetings** (once per year). This includes sharing unique knowledge, experiences, and insights from new projects, inviting the consortium to events, conferences, and other activities, and ensuring ongoing knowledge exchange.

3. Duration and Timeline

- This Letter of Commitment demonstrates the comitment between the [name of the PP] and the [name of the partnering organization] and shall remain in force until all obligations set out herein have been fulfilled, and in any case no later than five years after the end of the project (31.03.2031).
- This Letter has been created to ensure the commitment of the project partners and associated partners to the long-term sustainability of the three transnational solution systems (CIA, STRATLAB, FACTORY) developed within the project, committing them to expanding the knowledge generated, integrating the results into their own ecosystems or disseminating them within their networks, and continuing their cooperation within the Smart Circuit consortium.
- The signature of a Party affixed either as a scanned image of a handwritten signature (e.g., in PDF format) or via an electronic signature (e.g., through DocuSign or a similar platform) shall have the same legal force and effect as an original handwritten signature for the purposes of validity, enforceability, and admissibility. Delivery of the signed version of this Letter by email or through an

Abbreviations

Abbreviation	Explanation
AF	Application Form
ASP	Associated Partner
CA/PA	Consortium Agreement/ Partnership Agreement
CE	Central Europe
CIA	Circular Innovation Academy
CIDCs	Circular Innovation and Development Corridors
CiVEs	Circular Value Translation Engineers
DIH	Digital Innovation Hub
PP	Project Partner
RIS3	Research and Innovation Strategies for Smart Specialisation
SB	Strategic Board
TF	Task Force
TP	Technical Panel/Expert
TMM	Transnational Mobility Missions
WP	Work Package