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ERA Hubs Theory Of Change

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EXECUTIVE SUMMARY

This deliverable presents the Theory of Change (ToC) developed within the framework of the ERA_FABRIC project as a strategic and operational backbone for implementing the ERA Hubs concept across Europe. It provides a comprehensive, structured framework aimed at reinforcing regional research and innovation (R&I) ecosystems by aligning them with the objectives of the renewed European Research Area (ERA). The ToC serves not only as a planning instrument but also as an actionable guide for translating high-level policy ambitions into impactful, locally grounded initiatives that support excellence, inclusivity, knowledge circulation, and societal relevance.

The ERA Hubs Theory of Change follows a logic model structured around five interconnected stages: identifying systemic needs, defining inputs and activities, generating outputs, achieving outcomes, and enhancing long-term impacts. It integrates a stakeholder-informed and evidence-based approach, grounded in extensive consultation through surveys, workshops, and interregional dialogue. This process has revealed a diverse set of structural and institutional challenges across regions, which the ToC aims to address with 21 co-developed policy instruments.

These policy instruments are organized under four strategic pillars: (1) Enhancing the local impacts and synergies of EU framework programme project results; (2) Deepening the human centricity of R&I policies; (3) Connecting territories through smart specialisation complementarities; and (4) Promoting a single market for the green and digital transition. Each pillar is articulated through multiple micro-Theories of Change and provide tailored interventions.

At the operational level, the instruments lead to a series of short-term and mid-term outputs. These, in turn, yield outcomes that reinforce systemic change: testing the ERA Hubs model, increasing interregional interoperability, developing common platforms for action, and facilitating talent circulation and knowledge transfer. This leads to long-term impacts aligned with ERA's strategic goals, projected as the culmination of well-defined, cumulative steps grounded in realistic pathways for regional transformation.

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ABBREVIATIONS

ERA	European Research Area
EC	European Commission
EU	European Union
GA	Grant Agreement
ToC	Theory Of Change
R&I	Research and Innovation

INTRODUCTION

This document presents a comprehensive Theory of Change (ToC) developed within the framework of the ERA_FABRIC project, specifically designed to operationalize and implement the ERA Hubs concept. This Theory of Change provides a structured and extensive guide aimed at fostering actionable strategies to significantly enhance research and innovation (R&I) ecosystems across Europe. It serves multiple roles - as a detailed strategic blueprint, a practical roadmap, and a resource-rich repository - for stakeholders ranging from policymakers and research institutions to industry players and civil society groups, all working collaboratively to strengthen and expand innovation capabilities at local, regional, and European levels.

Rooted deeply in the strategic priorities of the European Research Area (ERA), this Theory of Change is firmly aligned with ERA's renewed focus on achieving excellence, promoting inclusivity, facilitating robust knowledge transfer, and ensuring societal relevance and alignment in research and innovation policies. ERA Hubs aim at creating transformative pathways capable of achieving meaningful and sustained improvements within European research and innovation environments by addressing fundamental systemic barriers that impede the efficient translation of policies into tangible impacts.

At the heart of the ERA Hubs Theory of Change is a robust and comprehensive stakeholder engagement process. This process involves extensive interregional dialogues, targeted workshops, in-depth consultations, and collaborative co-creation activities designed to promote inclusive participation and shared understanding of innovation strategies. ERA_FABRIC has effectively harnessed diverse regional perspectives and experiences, synthesizing these into a coherent, practical, and evidence-based model that directly addresses identified needs and gaps. This document provides detailed insights into various policy instruments available to stakeholders, along with practical guidance for their implementation.

This Theory of Change not only outlines comprehensive and targeted pathways for enhancing the effectiveness and sustainability of European innovation ecosystems, but also emphasizes the importance of robust governance structures and proactive stakeholder participation. This deliverable strives to create durable and adaptive frameworks capable of supporting innovation excellence and deploying meaningful societal impacts across Europe through bridging strategic ERA objectives with actionable policy instruments.

METHODOLOGY

This section details the comprehensive methodological approach adopted in ERA_FABRIC to construct the Theory of Change. In the ERA context and the EU's twin transition, ToC provides a structured way to plan and evaluate complex Innovation initiatives. It does so by outlining the logical pathway from Needs to Inputs through Activities to Outputs, Outcomes, and ultimately Impacts. This framework helps clarify assumptions about how Innovation policies will generate benefits. The EU's recent policy shift toward mission-oriented and transformative Innovation underscores the explicit ToCs linking investments to societal goals. Below, we review how each component of the ToC model is defined and used in ERA_FABRIC and ERA Hubs, and how its ToC is operationalized.

The starting point of a Theory of Change is a well-defined need or problem that an intervention will address. In the ERA_FABRIC context this corresponds to regional challenges towards implementing a high-performance innovation ecosystem. Due to the nature of the project, identifying these needs have involved building a joint vision among stakeholders about the desired change. This has been done through a double approach: first, a complete EU-wide stakeholder survey on the most recurrent characteristics of knowledge ecosystems, integrating 169 stakeholders across Europe. Second, four workshops developed with the participation of around 140 stakeholders where they all incorporated their vision and experiences on the present needs that they had (as representatives of regional ecosystems) and their opinion on how these needs could be solved by ERA Hubs.

Inputs (or resources) refer to the general rollout plan and the financial, human, institutional, and material resources mobilized to support policy instruments. The resources needed to execute the policy instruments linked to ERA Hubs, and how they are allocated to the chain of results, are key to obtaining the ultimate impacts. Thus, ERA Hubs ToC makes explicit how inputs and deployment strategies are expected to contribute to the implementation of ERA Hubs across the European Union. These inputs, while by definition are a previous step to implementing activities, were defined after the identification of ToC key activities during ERA_FABRIC.

Activities are the concrete actions and interventions undertaken using the inputs. These activities are policy instruments that ERA_FABRIC consortium have co-developed based on a thorough analysis of the 33 use cases identified in its **Catalogue of Measures and Tools** deliverable. Case per case, the team ran an analysis of what were the commonalities that defined the success of each use case (Figure 1). Thus, the team actively looked for common characteristics (e.g. actions, processes, instruments) that were common among successfully analyzed use cases and across the four domains of action of ERA_FABRIC and extracted those features.

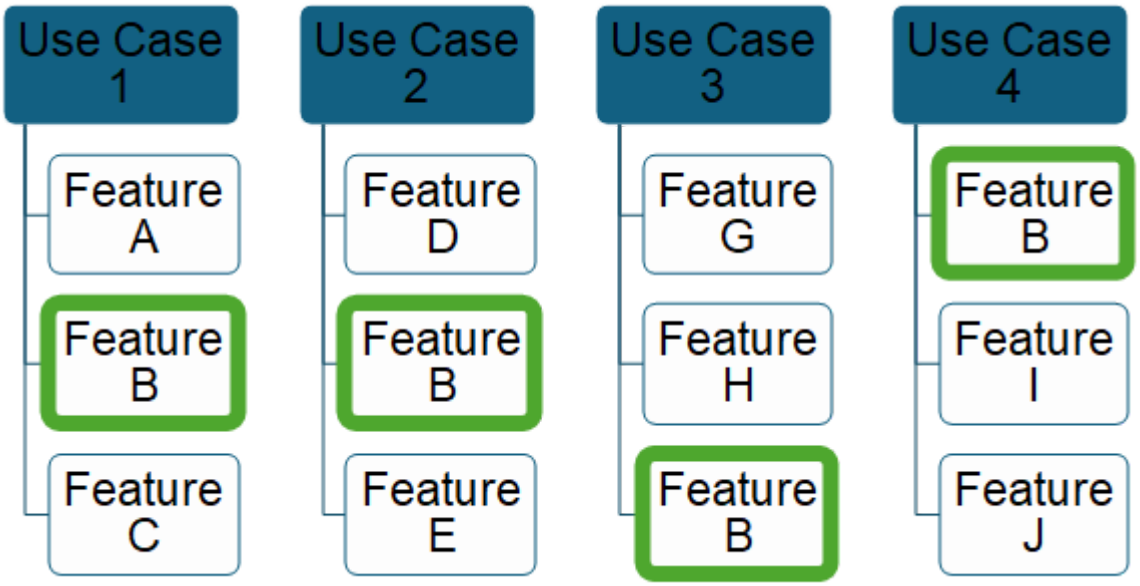

Figure 1: Identification of commonalities among use cases included in ERA_FABRIC Catalogue of Measures and Tools

Once the commonalities among use cases were identified, we developed up to 5 policy instruments per section based on the common features extracted from the use case analysis. This was also complemented with 1 innovative policy instrument per section that, although not specifically based on the success of commonalities identified in the analysis process, was aimed at actively complementing the policy instruments developed. Thus, we developed a total of 21 policy instruments (or activities, in the ToC framework), the 4 sections that correspond to the following key thematic domains and objectives in the ERA perspective:

- Promoting a single market for green and digital transition
- Connecting territories through smart specialization complementarities
- Enhancing the local impacts and synergies of EU framework program project results
- Deepening the human centricity of R&D and innovation policies

Outputs are the immediate, direct results produced by the activities. They are typically tangible or observable products resulting from the implementation of the policy instruments, and they occur in the short term. In the context of ERA_FABRIC, the outputs are the convergence of the innovation ecosystem towards the "ERA Hub" ideal type, defined in **ERA_FABRIC Partner Profiles** deliverable. Thus, thanks to the application of the identified policy instruments, regions are capable of adjusting their performance to the "ideal type" of ERA Hub emerging as a reference model. Each policy applied policy instrument leads to a direct or indirect increase on one or multiple structure levels (Figure 2).

	LEVEL 1:	LEVEL 2:	LEVEL 3:
ERA Hubs Index	S1: Access to Research & Innovation Infrastructure and Services	S1.1: R&I Collaboration Capacities	1.1. There is high alignment of research priorities and industry needs.
			1.2. There are joint strategies between private and public actors towards shared goals.
			1.3. There is some R&I infrastructure available in my region.
			1.4. There are clear and transparent modalities to access the available R&I infrastructure.
		S1.2: Innovation Support Services	1.5. Innovation service needs are identified via interactive and inclusive governance processes.
			1.6a. There are professional service providers operating close to UNIVERSITIES (e.g., TTOs, IPR experts, incubators, accelerators, etc).
			1.6b. There are professional service providers operating close to COMPANIES (e.g., R&I consulting firms, IPR experts, clusters, incubators, accelerators, etc).
			1.7. There is enough demand for innovation support services.
	S2: Policy Support & Governance Processes	S2.1: Governance	2.1. There is awareness among local policymakers of the importance and benefits of research and innovation.
			2.2. The public policies carried out locally are consistent with the needs of private actors.
			2.10. The local governance processes are balanced, transparent, open, and evidence based.

	LEVEL 1:	LEVEL 2:	LEVEL 3:
			2.11. Good governance models to manage shared resources are put in place.
			2.12. The processes of local governance involve active engagement of civil society.
			2.13. There is a common focus on environmental sustainability of innovation processes.
			2.14. There are none or only minor regulatory hurdles (to e.g., researcher public-private mobility, or research commercialization).
		S2.2: Stakeholders Engagement	2.3a. Major steps forward are achieved by individual champions.
			2.3b. Major steps forward are achieved by inclusive and forward-looking governance.
			2.5. There are sufficient incentives and/or resources allocated to retain talent and young researchers.
			2.6. There are sufficient incentives targeting collaboration between industry and academia actors.
			2.8. There are good levels of trust and exchange among key stakeholders.
			2.9. There is a balance of power across key stakeholder groups.
		S2.3: Funding Support	2.4a. There is long-term policy support and availability of REGIONAL funding for innovation.
			2.4b. There is long-term policy support and availability of NATIONAL funding for innovation.

	LEVEL 1:	LEVEL 2:	LEVEL 3:
			2.4c. There is long-term policy support and availability of EU funding for innovation.
			2.7. The different financial resources (private fees, public direct funding, public funding to competitive projects etc.) are well balanced.
	S3: Collaboration & Knowledge Transfer	S3.1: Collaboration Culture	3.1a. There is an affirmed collaboration culture within your region.
			3.1b. There is an affirmed collaboration culture between public and private actors in your region.
			3.1c. There is an affirmed collaboration culture between your and other European regions.
			3.3. There is a strong collaboration culture between local universities, research organisations, local key industries, large companies, and local SME clusters.
		S3.2: Collaboration Model	3.2. The regional authority supports collaboration with partners from other European regions (financial or non-financial support).
			3.4. There is extensive experience in science-industry collaboration, including shared objectives and common strategies for economic and industrial development.
			3.5. There is close collaboration between private investors and entrepreneurs.
			3.10. Leading local companies participate in one or more of the following: clustering, corporate venturing, shared

	LEVEL 1:	LEVEL 2:	LEVEL 3:
			resources, and targeted industry need initiatives (e.g., hackathons).
		S3.3: R&I Activities Outcomes	3.6. There is enough commercialisation of local research results.
			3.7. Research and project results are effectively and sufficiently communicated to the local community and relevant stakeholders.
			3.8. There is good availability of skilled staff.
			3.9. There is good knowledge transfer based on collaborations.

Figure 2: Structuring criteria of the "ideal type" ERA Hub reference model

Outcomes are the short- to mid-term effects of the activities – the changes that happen because people or organizations use the outputs or because behaviors and systems adjust. Outcomes often indicate whether the activities and outputs are on track to contribute to the ultimate goals. In the ERA Hubs context, outcomes are intrinsically related to the testing and establishment of ERA Hubs within the European Research Area context and strategy. Thus, outcomes are already defined, as, by definition, the development of a Theory of Change follows a "backward" analysis logic. Therefore, when regions converge towards the "ideal" reference ERA Hub model thanks to the application of the identified activities, this automatically leads to the following outcomes:

- Testing the ERA Hubs concept
- Ensuring new ERA's "smart directionality"
- Developing a common platform
- Increasing inter and intra-operability
- Facilitating talent circulation and absorption
- Providing a best practice toolbox

Finally, **impacts** are the long-term, high-level goals that the activities ultimately aim to achieve. They correspond to the broader societal, economic, or environmental changes resulting from the outcomes, often aligned with strategic objectives. In the case of ERA Hubs, whose goals are directly related to the European Research Area goals and strategy, the impacts that are generated by the previously identified outcomes are:

- Accelerating the green and digital transformation of the European Union

- Improving access to excellence and increase the performance of RDI systems in compliance with S3(S4)
- Improving transferability of RDI results to the economy and society
- Deepening the ERA through knowledge creation, circulation and use

When integrating these 6 elements, the ERA Hubs Theory of Change framework can be summarized in the following Figure 3:

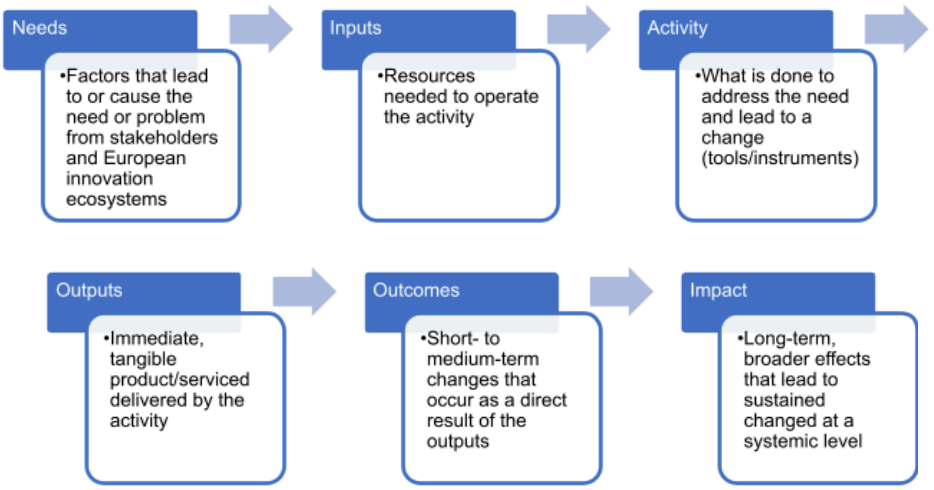

Figure 3: General structure of the ERA Hubs ToC

However, this leads to the observation that, as there are 21 different policy instruments, this could lead to 21 different Theories of Change. This is partially true; **ERA Hubs Theory of Change is actually formed by 21 micro-Theories of Change that, when merged, form one sole general Theory of Change applicable to ERA Hubs**.

To facilitate the reading process, the micro-Theories of Change have been developed following the next template (Table 1):

ERA_FABRIC thematic domain	
Needs	Factors that lead to or cause the need or problem from stakeholders and European innovation ecosystems
Activities	What is done to address the need and lead to a change (tools/instruments)
Outputs	Benefits provided by the implementation of the policy instrument
Outcomes	Short- to medium-term changes that occur as a direct result of the outputs
Impacts	Long-term, broader effects that lead to sustained changes at a systemic level

Table 1: Template for the micro-ToCs developed

Then, each micro-ToC is an aggregation of the different policy instruments per each ERA_FABRIC thematic domain and they are constructed with a similar template (Table 2):

Title of the policy instrument	
Type of policy instrument	Typology of policy instruments. Based on the classification provided by Martinez, McGlade and Stelljes (2017)[1]. They could be: • Regulatory instruments (compulsory regulation, bans, standards, limits…) • Planning instruments (regional planning, land-use, urban planning…) • Market-based/economic instruments (taxes, subsidies, property rights…) • Public investments (infrastructure investments, procurement, R&D spending…) • Cooperation-based instruments (voluntary commitments, negotiations, networks…) • Information-based instruments (information campaigns, education, advisory services, capacity building, labelling, access to information…
Needs	Factors that lead to or cause the need or problem from stakeholders and European innovation ecosystems
Activity	What is done to address the need and lead to a change (tools/instruments)
Outputs	Benefits provided by the implementation of the policy instrument
Outcomes	Short- to medium-term changes that occur as a direct result of the outputs
Impacts	Long-term, broader effects that lead to sustained changes at a systemic level

Table 2: Template of the developed policy instruments per thematic domain

[1] Stelljes, N., Albrecht, S., Martinez, G., & McGlade, K. (2017). *Proposals for new governance concepts and policy options* (BONUS SOILS2SEA Deliverable No. 6.2). Ecologic Institute. https://www.researchgate.net/publication/323607443_Proposals_for_new_governance_concepts_and_policy_options_SOILS2SEA_DELIVERABLE_NO_62

Policy instruments and micro-Theory of Change

Enhancing the local impacts and synergies of EU framework programme project results

Policy instruments

Participatory governance mechanisms at local level to promote local stakeholder collaboration	
Type of policy instrument	Planning & Cooperation-based instruments.
Needs	EU-funded programs and projects tend to fail on boosting the impact at local level, remaining at a top level with high-level objectives instead of having local stakeholder engagement and successful implementation to local needs. Moreover, local key actors of the Quintuple Helix are not often effectively mobilized during the development of EU projects. From the cases analyzed in the present document, it can be seen how collaborative governance approaches ensure that local needs are reflected as well as implementing participatory governance mechanisms.
Activity	The main point of this policy instrument is to establish effective and robust participatory governance mechanisms in which local stakeholders can co-design EU-funded programs and projects. Also, these mechanisms can be incorporated at a later stage when it is time for implementing and evaluating the outcomes from such programs and projects. ERA Hubs can coordinate the mechanisms in order to facilitate this alignment between EU objectives with regional and local needs by fostering cooperation. For the implementation of this, it is recommended to create a multi-stakeholder governance platform including representatives from all the groups in the Quintuple Helix. These platforms will serve as the decision-making bodies to ensure alignment between parties (EU schemes and regional/local priorities). Participatory activities around the platform can be citizen engagement forums, co-design workshops and community advisory boards.
Outputs	• Increased local ownership: Co-design sessions and activities at a local level fosters a stronger sense of ownership from local stakeholders to EU community priorities (S2.1/ S2.2 / S3.1 / S3.2). • Empowered local communities: Participation in tailoring EU projects to local needs and challenges induces inclusivity and collective action from local to higher levels of action. (S2.1/ S2.2 / S3.1 / S3.2)

	• Higher level of adaptability of EU projects: Collaborative and participatory approaches lead to EU initiatives with greater level of impact. (S1.1/S2.1 / S2.2 / S3.1 / S3.2 / S3.3) • Strengthened regional collaboration: When this policy instrument scales, multi-stakeholder participation can take place across regions and sectors which in turn creates synergies. (S3.1 / S3.2)
Outcomes	• Testing the ERA Hubs concept • Ensuring new ERA's "smart directionality" • Developing a common platform • Increasing inter- and intra-operability • Facilitating talent circulation and absorption • Providing a best practice toolbox
Impacts	• Accelerating the green and digital transformation of the EU • Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability • Improving transferability of RDI results to the economy and society • Deepen the ERA through knowledge creation, circulation and use

Table 3: Policy instrument 1

Capacity building and education program on enhancing local impact	
Type of policy instrument	Information-based instrument
Needs	Many regions lack the necessary knowledge to maximize the local impact of EU programs and projects. Limited understanding of how to adapt EU framework initiatives to regional and local contexts often results in missed opportunities for economic, environmental, and social benefits. Capacity-building and educational programs can empower local actors from the Quintuple Helix to better understand and implement EU initiatives. This policy instrument fosters an ecosystem that can effectively leverage EU programs for sustainable regional development through equipping stakeholders with the tools and knowledge to align EU project goals with local realities.
Activity	An initial in-depth assessment of the regional needs of the Quintuple Helix is necessary to identify specific knowledge gaps and opportunities for capacity development. This assessment will inform the design of tailored training modules and educational resources that address the unique challenges of each region. Then, a complete capacity-building activity pack will be provided by ERA HUBs. Capacity-building activities and sessions will focus on topics such as project adaptation to local contexts and strategies and tools for measuring local impact. The sessions could include case studies and best practices from EU projects to offer practical insights and relatable examples. In the future, when scaling up the instrument, ERA Hubs can establish a Community of Practice for stakeholders, as well as a digital learning platform. Both the network and the platform will serve as a collaborative space for exchanging knowledge and lessons learned.
Outputs	• Increased local Impact: Enhances the local impact of future EU projects thanks to improved knowledge by key stakeholders related to them. (S3.3) • Stronger stakeholder collaboration: Builds relationships and trust between local governments, businesses, and citizens, creating a unified approach to regional development (S1.2 / S2.1 / S2.2 / S3.1 / S3.2) • Empowered communities: Provides citizens and local organizations with the skills and confidence to actively engage in EU programs. (S1.2 / S2.1 / S2.2 / S3.1 / S3.2)

	• Knowledge spillover: Creates a culture of continuous learning and innovation, with knowledge shared across regions through the community of practice. (S3.1 / S3.2 / S3.3)
Outcomes	• Testing the ERA Hubs concept • Ensuring new ERA's "smart directionality" • Developing a common platform • Increasing inter- and intra-operability • Facilitating talent circulation and absorption • Providing a best practice toolbox
Impacts	• Accelerating the green and digital transformation of the EU • Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability • Improving transferability of RDI results to the economy and society • Deepen the ERA through knowledge creation, circulation and use

Table 4: Policy instrument number 2

Pilot programs and demonstration projects mechanisms at local level	
Type of policy instrument	Planning and Cooperation-based instrument.
Needs	To maximize the impact of EU project results the most possible, it is important to focus on the current gap between the project design and the implementation in the real world. There is some uncertainty and misalignment when adapting EU project outcomes to specific local and regional contexts. For that, pilot programs and demonstration projects can be a solution to experiment and test the outcomes at the local level, defining the refinement that should be done to align EU-level objectives with local priorities and challenges.
Activity	Pilot programs and demonstration projects should be established as practical tools for the local environment and stakeholders to test, validate and showcase the impact that EU funding programs can have at local level. ERA Hubs can contribute by facilitating the management, funding and implementation of pilot initiatives at a smaller scale. Also, the facilitation of demonstration projects can showcase more tangible and visible outcomes and they can represent a proof-of-concept to see how they can contribute to address local challenges. Moreover, throughout the execution of this policy instrument, ERA Hubs can support local stakeholders with the provision of technical and financial assistance to ensure EU projects implementation, facilitating continuous feedback and monitoring to assess impact and identifying areas for improvement, organizing public showcases and disseminating results and lessons learned.
Outputs	• Demonstrable local impact: Tangible outcomes are showcased at local context and this builds trust among local stakeholders and civil society. (S1.1 / S2.2 / S3.3) • Higher knowledge transfer and replication: Successful pilots and projects tested throughout the implementation of this policy instrument enhance scalability and replication, promoting synergies between EU programs and local development. (S1.1 / S1.2 / S3.1 / S3.2 / S3.3) • Fostering real-world testing and adaptation: This reduces the usual risks for implementing EU project outcomes and encourages citizens and local organizations with evidence that these solutions meet regional/local needs. (S1.1 / S2.2 / S3.2 / S3.3)

	• EU alignment with regional and local needs: Ensures that EU programmes contribute to induce economic growth and innovation in the local environment. (S1.1 / S2.2 / S2.3)
Outcomes	• Testing the ERA Hubs concept • Ensuring new ERA's "smart directionality" • Developing a common platform • Increasing inter- and intra-operability • Facilitating talent circulation and absorption • Providing a best practice toolbox
Impacts	• Accelerating the green and digital transformation of the EU • Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability • Improving transferability of RDI results to the economy and society • Deepen the ERA through knowledge creation, circulation and use

Table 5: Policy instrument number 3

Digital platforms for local engagement	
Type of policy instrument	Cooperation-based instrument.
Needs	There is often a lack of efficient communication and engagement mechanisms between EU policymakers and implementers with local stakeholders. For the cases analyzed in the present document, it is seen that digital platforms are useful for local engagement. These platforms tend to create interactive, inclusive and accessible spaces where local stakeholders collaborate to understand, shape and monitor the local impact from EU-funded projects.
Activity	The development and deployment of digital platforms to facilitate local engagement which in turn contributes to enhancing local impact. In order for these platforms to provide an inclusive and transparent digital space, the design and functionalities should be orientated to present a space where all relevant stakeholders present in the local context have room to actively participate and share perspectives. One of the important elements is the information hub that configures the platform, where clear and accessible information will increase the level of transparency and trust between local stakeholders and EU project implementers. Other features to be considered by ERA Hubs hosting this type of digital platforms are interactive feedback mechanisms and collaborative decision-making tools. Both are oriented to have co-creation processes and activities when defining how EU funding programs can address local challenges and needs. Besides this, it is important to ensure accessibility to maximize the scope of the local impact. This implies building easy-going dashboards while incorporating user-friendly interfaces and multilingual support for any potential local participant that may join the platform.
Outputs	• Increased transparency: User-friendly interfaces facilitate the level of understanding of users which in turn contributes to greater levels of transparency of the data and the information displayed. (S2.1 / S3.1 / S3.2 / S3.3) • Enhanced local participation: More inclusive local engagement is possible throughout the implementation of such digital tools. (S2.1 / S2.2) • Scalable and cost-effective solution: The digital infrastructure of this type of platform can be easily customized to address other challenges that from EU funding can impact the local context. (S1.1 / S1.1 / S3.2)
Outcomes	• Testing the ERA Hubs concept

	• Ensuring new ERA's "smart directionality" • Developing a common platform • Increasing inter- and intra-operability • Facilitating talent circulation and absorption • Providing a best practice toolbox
Impacts	• Accelerating the green and digital transformation of the EU • Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability • Improving transferability of RDI results to the economy and society • Deepen the ERA through knowledge creation, circulation and use

Table 6: Policy instrument number 4

Tailored financing mechanism for initiatives with local impact	
Type of policy instrument	Public investment
Needs	One of the most significant challenges in maximizing the local impact of EU programs is the misalignment between existing funding mechanisms and the needs of local stakeholders. Conventional financing schemes often prioritize large-scale projects with rigid criteria, leaving smaller, community-driven underserved. This results in missed opportunities for grassroots innovation and sustainable regional development. SMEs, local governments, and citizen-led projects, which are essential drivers of localized impact, frequently lack access to flexible financial tools that can accommodate their specific contexts and goals.
Activity	The intervention involves creating a financing mechanism specifically designed for the needs of local actors, including SMEs, start-ups, municipalities, and citizen groups. This mechanism would provide a diverse set of funding options tailored to the scale and scope of local initiatives that seek to implement or adapt EU framework program results. The financing instrument would operate through a multi-tiered approach, ensuring accessibility for projects of varying sizes and complexity. Small-scale community initiatives, such as neighbourhood-led sustainability projects or micro-innovation pilots, would benefit from micro-grants and participatory loans that feature low administrative burdens and fast approval processes. For mid-sized initiatives, such as SME innovation projects or municipal green infrastructure plans, impact-linked loans and co-financing grants would be available, tying disbursements to measurable local outcomes, such as energy efficiency gains or job creation. Additionally, the financing mechanism would incorporate citizen investment platforms and cooperative financing models. These tools would empower local communities to contribute financially to initiatives that align with their priorities while generating local returns. For example, participative financing schemes could allow residents to invest in renewable energy cooperatives, where they receive dividends based on project performance. Similarly, crowdfunding opportunities would be matched by ERA Hubs' regional financing to amplify the resources available for community-driven projects. Finally, a key feature of this mechanism would be its flexibility to address diverse local realities. Funding criteria would prioritize initiatives that demonstrate alignment with regional needs and contribute to the EU's broader priorities. To ensure the mechanisms remain accessible, regional advisory

	offices within ERA Hubs could provide support in navigating the application process.
Outputs	• Enhanced accessibility: The mechanism will enable a wider range of local actors to access funding and implement impactful projects. (S2.2 / S2.3) • Increased local ownership: Citizen investment and cooperative financing models will foster stronger local engagement, ensuring that funded initiatives reflect community priorities and generate shared benefits. (S1.1 / S1.2 / S2.1 / S2.2 / S2.3 / S3.1) • Stronger local impact: The mechanism will ensure tangible improvements in economic, social, and environmental conditions by linking funding to measurable outcomes. (S1.1 / S2.1 / S2.2 / S2.3) • Support for grassroots Innovation: Micro-grants and participatory loans will empower smaller, community-led initiatives to innovate and address regional challenges in creative ways. (S1.1 / S2.1 / S2.2 / S2.3 / S3.1)
Outcomes	• Testing the ERA Hubs concept • Ensuring new ERA's "smart directionality" • Developing a common platform • Increasing inter- and intra-operability • Facilitating talent circulation and absorption • Providing a best practice toolbox
Impacts	• Accelerating the green and digital transformation of the EU • Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability • Improving transferability of RDI results to the economy and society • Deepen the ERA through knowledge creation, circulation and use

Table 7: Policy instrument number 5

Cross-regional mobility schemes *(Innovative instrument)*	
Type of policy instrument	Cooperation-based instrument.
Needs	The implementation of EU-funded programs and projects often faces significant discrepancies in success rates across regions due to varying levels of expertise and institutional capacity. Key local stakeholders frequently operate in isolated ecosystems, limiting their ability to learn from successful approaches adopted in other regions. There is a clear opportunity to address this by fostering business mission-style cross-regional mobility schemes.
Activity	The cross-regional mobility scheme would function as a business mission for program ideators and implementers (such as project managers, policymakers, regional officers, and other stakeholders) to engage in structured visits to regions with exemplary practices in implementing EU programs with a high degree of local impact. These missions would serve as hands-on learning experiences, allowing participants to directly observe successful models and interact with peers. Each mission would focus on a specific thematic area, such as climate resilience, digital transformation, circular economy, or innovation ecosystems, aligning with EU priorities and regional challenges. Participants would be selected based on their role in implementing EU programs, ensuring they can apply the insights gained to their local strategies and projects. Participants would visit successful EU-funded projects and programs in the host region, gaining first-hand exposure. These site visits could be complemented by interactive workshops where participants can analyze case studies and discuss the methodologies behind successful outcomes. On the other hand, host regions would pair visiting participants with local experts, program managers, and policymakers who have overseen successful projects. Structured roundtable could encourage dialogue between participants and host regions stakeholders; networking sessions would also create long-term collaborations, strengthening interregional partnerships.
Outputs	• Accelerated knowledge transfer: Regions with successful practices will serve as models, accelerating the adoption of proven solutions for implementing EU programs and maximizing their local impact. (S3.2 / S3.3) • Capacity Building: Program implementers will gain know-how to enhance their expertise and address region-specific challenges effectively. (S1.2 / S3.3)

	• Improved program outcomes: The Exchange of best practices and successful governance models will lead to higher-quality project implementation, benefiting local economies and communities. (S3.3) • Strengthened interregional collaboration: The mobility scheme would establish networks for long-term partnerships, promoting mutual learning and cross-regional cooperation. (S3.2)
Outcomes	• Testing the ERA Hubs concept • Ensuring new ERA's "smart directionality" • Developing a common platform • Increasing inter- and intra-operability • Facilitating talent circulation and absorption • Providing a best practice toolbox
Impacts	• Accelerating the green and digital transformation of the EU • Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability • Improving transferability of RDI results to the economy and society • Deepen the ERA through knowledge creation, circulation and use

Table 8: Innovative policy instrument number 1

Micro – Theory of Change

Enhancing the local impacts and synergies of EU frameworks programme project results	
Needs	• EU-funded programs often fail to engage local stakeholders effectively, missing alignment between high-level objectives and local needs • Regions frequently lack necessary knowledge and skills to adapt and maximize the local impact of EU initiatives • There's significant uncertainty and misalignment when adapting EU projects to real-world local contexts, requiring practical testing and demonstration • Inefficient communication mechanisms hinder meaningful collaboration between EU policymakers and local stakeholders • Existing financing mechanisms are inadequate for small-scale and community-driven projects, limiting grassroots innovation • Varying expertise across regions creates isolated ecosystems, necessitating structured knowledge transfer and interregional collaboration
Activity	• Participatory governance mechanisms at local level to promote local stakeholder collaboration • Capacity building and education program on enhancing local impact • Pilot programs and demonstration projects mechanisms at local level • Digital platforms for local engagement • Tailored financing mechanisms for initiatives with local impact • Cross-regional mobility schemes
Outputs	Improved: • R&I collaboration capacities (S1.1) • Access to innovation support services (S1.2) • Governance procedures (S2.1) • Stakeholders' engagement (S2.2) • Funding support (S2.3) • Collaboration culture (S3.1) • Collaboration model (S3.2)

	• R&I activities outcomes (S3.3)
Outcomes	• Testing the ERA Hubs concept • Ensuring new ERA's "smart directionality" • Developing a common platform • Increasing inter- and intra-operability • Facilitating talent circulation and absorption • Providing a best practice toolbox
Impacts	• Accelerating the green and digital transformation of the EU • Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability • Improving transferability of RDI results to the economy and society • Deepen the ERA through knowledge creation, circulation and use

Table 9: Micro-ToC of Enhancing local impact

Deepening the human centricity of R&D and innovation policies

Policy instruments

Participatory and co-creation mechanisms	
Type of policy instrument	Planning & Cooperation-based instruments
Needs	This participatory mechanism responds to the gap identified that Research and Innovation policies tend to fail to adequately the needs, values and expertise of the diversity of stakeholders and actors that are involved which leads to a misalignment between policy actions and societal challenges. This can contribute to improving the level of trust and perceived alignment by local and regional stakeholders regarding the matchmaking between policy actions and the need of private, public and civic actors. Moreover, from this policy instrument, ERA Hubs can also empower local communities, including the most underrepresented groups.
Activity	This policy instrument encourages the identification of the key groups including mainly citizens but also researchers, policymakers, industry representatives and marginalized communities (e.g. elderly people, rural population). Apart from the stakeholder mapping, it is also crucial for ERA Hubs to spend efforts on engaging the interested stakeholders by launching awareness campaigns and inviting them to participate actively within and across regions. This should be complemented with digital platforms that enable the organization of co-creation sessions where the stakeholders involved in the initiative can freely collaborate with each other to define challenges, bring solutions and design innovation projects. Besides this, iterative feedback loops should be considered so that ERA Hubs implement some mechanisms to allow continuous feedback from stakeholders, which contributes to incorporating human-centric values on the development of innovation projects and policies.
Outputs	• **Enhancement of human-centric innovation:** Participatory mechanisms ensure this diverse, social and human-centric perspective by involving citizens, researchers, policy makers and marginalized communities. Therefore, there is higher alignment with real societal challenges, reflecting shared values and needs. (S1.2 / S2.1 / S2.2 / S3.1 / S3.2) • **Increased level of trust and legitimacy:** Policymakers can benefit from stronger public support from civil society and other relevant

	stakeholders while citizens have more confidence in the innovation policies taking place. (S2.1 / S2.2 / S3.1) • **Empowerment of local communities:** Co-creation processes empower communities to take a more active role in shaping innovation, which also contributes to create a stronger sense of ownership and responsibility, enhancing then human-centric values at a social level. (S1.2 / S2.1 / S2.2 / S3.1) • **Alignment with societal challenges:** Incorporation of citizen feedback at all stages of policy development that contributes to have alignment with the real societal challenges. (S1.2 / S2.1 / S2.2 / S3.1 / S3.2) • **Fostered innovation ecosystems with diversity values:** there is sparking of creativity from different segments of the population encouraged in co-creation sessions performed by different segments of the population. (S1.2 / S2.1 / S2.2 / S3.1 / S3.2)
Outcomes	• Testing the ERA Hubs concept • Ensuring new ERA's "smart directionality" • Developing a common platform • Increasing inter- and intra-operability • Facilitating talent circulation and absorption • Providing a best practice toolbox
Impacts	• Accelerating the green and digital transformation of the EU • Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability • Improving transferability of RDI results to the economy and society • Deepen the ERA through knowledge creation, circulation and use

Table 10: Policy instrument number 6

Mechanisms to enhance the human perspective from pilot programs	
Type of policy instrument	Planning instrument & Public investment (due to the infrastructure investment of the pilot program itself).
Needs	Traditional R&I frameworks often lack the ability to make efforts on building testing environments, and this is what limits the scalability potential of the innovative solutions. Pilot programs present an opportunity for those rigid structures as they provide dynamic real-word environments (e.g. living labs) in a certain domain of innovation to collaborate and validate the innovative solutions (e.g. circular economy, energy transition, etc.). This need was manifested by stakeholders in the ERA_FABRIC survey, who missed the linking of innovation project results to final user feedback and regional specific needs. Therefore, this instrument directly responds by including a human-centric perspective at the core of the pilot program at design and execution phases.
Activity	To design and implement adequate pilot programs with the aim of testing new R&I policies, ERA Hubs must consider several mechanisms to adopt them in an efficient way. Since the beginning it is important to collaborate with regional stakeholders to identify the challenges that the R&I policies will address. Then, based on that the definition of the scope, goals and KPIs should be done for each pilot program. For implementing such a program, Living Labs are attractive as they provide open and real-world environments where testing can happen outside from traditional laboratories or abstract simulations. ERA Hubs can consider this approach to ensure that pilots are evaluated in dynamic settings, which contributes to improving scalability and enhancing human-centric values in the development of R&I outcomes. To enhance the latest the most possible, iterative feedback tools and analysis of performance data should be included during the testing of pilot programs.
Outputs	• **Maximized impact of innovation expenditures and projects:** Pilot developers and end-users benefit from this policy instrument as pilot programs ensure that innovation expenditures are better strategically allocated and solutions are tested. (S1.1 / S1.2 / S2.2 / S3.2) • **Increased level of inclusivity and human-centric values in R&I:** Pilot programs encourage inclusivity by involving a diverse sample of population located in the place where the pilot is settled. (S1.1/ S1.2 / S2.2 / S3.1) • **Higher acceleration in the innovation cycle:** This level of iteration during the development of project solutions enables faster market

	deployment of human-centric solutions in the real world. (S2.2 / S3.1 / S3.2 / S3.3) ● Specially for Living Labs, they build **stronger regional innovation ecosystems** as they involve a great level of local collaboration and knowledge exchanges. (S1.1 / S2.2 / S3.1 / S3.2 / S3.3)
Outcomes	● Testing the ERA Hubs concept ● Ensuring new ERA's "smart directionality" ● Developing a common platform ● Increasing inter- and intra-operability ● Facilitating talent circulation and absorption ● Providing a best practice toolbox
Impacts	● Accelerating the green and digital transformation of the EU ● Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability ● Improving transferability of RDI results to the economy and society ● Deepen the ERA through knowledge creation, circulation and use

Table 11: Policy instrument number 7

Capacity building and education programs on RRI principles	
Type of policy instrument	Information-based instrument
Needs	The lack of integration of Responsible Research and Innovation (RRI) principles into R&I processes often limits the human-centricity of innovation policies. This gap arises due to several challenges, including insufficient awareness and understanding of RRI among key stakeholders such as policymakers, researchers, industry actors and citizens. This gap really concerns regional stakeholders as stated in the ERA_FABRIC survey, which in turn contributes to misalignment between innovation policy strategies and real societal needs. Therefore, there is a significant opportunity to address these gaps through structured capacity-building and education programs focused on RRI principles. It is necessary to equip Quintuple Helix actors with the necessary tools and knowledge to embed human-centric approaches into every stage of innovation processes.
Activity	The capacity-building and education programs on RRI principles aim to create a comprehensive learning structure that empowers all stakeholders to apply responsible and inclusive practices in innovation processes. To begin, an in-depth assessment of regional needs would be conducted to identify knowledge gaps and opportunities for training. Then the program would provide practical, targeted content, offering training on core RRI concepts such as ethics in innovation, participatory co-creation processes, sustainability integration, and transparent governance models. The modules would be adapted to suit the needs of each group: for instance, policymakers would focus on ethical policymaking and public trust-building, while researchers would explore how to co-create innovations with end-users and ensure societal relevance. Alongside formal training, the program would feature hands-on workshops and webinars that facilitate collaborative learning. Digital tools and platforms could complement these efforts by offering open access to resources such as toolkits, case studies, video lectures, and practical guides on implementing RRI principles. To ensure continued engagement and shared learning, the program could establish Communities of Practice (CoPs) within ERA Hubs. These CoPs would serve as dynamic networks for peer-to-peer learning, connecting regions and stakeholders to exchange experiences and best practices in implementing RRI.

Outputs	● **Enhanced RRI Integration:** Innovation actions will reflect societal values through ethical, inclusive, and transparent processes. (S1.1/ S2.2) ● **Empowered stakeholders:** Key stakeholders will gain tools to engage in co-creation and participatory R&I. (S1.1/ S2.1/ S2.2) ● **Reduced capacity gaps**: Regions with Limited institutional expertise will be able to implement human-centric policies more effectively. (S1.1/ S2.2 / S3.1 / S3.2) ● **Increased societal impact**: Solutions will better address societal challenges, improving public trust in Innovation processes. (S1.1/ S2.2)
Outcomes	● Testing the ERA Hubs concept ● Ensuring new ERA's "smart directionality" ● Developing a common platform ● Increasing inter- and intra-operability ● Facilitating talent circulation and absorption ● Providing a best practice toolbox
Impacts	● Accelerating the green and digital transformation of the EU ● Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability ● Improving transferability of RDI results to the economy and society ● Deepen the ERA through knowledge creation, circulation and use

Table 12: Policy instrument number 8

Targeted financial mechanisms for human-centric innovation	
Type of policy instrument	Public investment instrument
Needs	Despite the growing emphasis on human-centric innovation, financial resources often fail to prioritize projects that align with RRI principles. Traditional funding schemes tend to focus on technological or economic outputs, overlooking critical elements such as societal impact and sustainability. As a result, regions and innovators with strong human-centric proposals often face challenges in accessing the financial support needed to design and scale such projects. This gap really concerns regional stakeholders as there are no sufficient incentives to support knowledge creation and transfer based on RRI values. Therefore, throughout this policy instrument which introduces targeted financial mechanisms can incentivize and enable the development of human-centric innovations could address this identified gap.
Activity	The targeted financial mechanisms would support the implementation of R&I projects aligned with human-centric principles. “Human-centric innovation grants” would provide direct financial support to projects that demonstrate clear societal benefits Furthermore, social impact-linked financing would incentivize societal outcomes through flexible financial instruments, such as loans with repayment terms linked to achieving predefined societal targets. Additionally, micro-funding programs would be developed to provide smaller-scale, flexible financial support to community-led projects and grassroots innovators tackling local societal challenges. Private sector participation could be encouraged through tax credits and co-financing schemes that reward businesses for contributing to human-centric innovations. Lastly, region-specific funds could target areas with limited institutional capacity, ensuring equitable access to financial resources and fostering balanced innovation ecosystems.
Outputs	• **Incentivized human-centric innovation:** Aligns financial support with societal needs, fostering projects that prioritize human-centric principles. (S1.1/ S2.3 /S3.3) • **Empowered local communities:** Provides financial resources to grassroots innovators, amplifying local impact and societal ownership. (S1.1/ S2.3 /S3.1/ S3.2/ S3.3) • **Increased private sector engagement:** Encourages businesses to contribute to human-centric Innovation through targeted incentives. (S1.1/ S2.3 / S3.1/ S3.2/ S3.3)

Outcomes	• Testing the ERA Hubs concept • Ensuring new ERA's "smart directionality" • Developing a common platform • Increasing inter- and intra-operability • Facilitating talent circulation and absorption • Providing a best practice toolbox
Impacts	• Accelerating the green and digital transformation of the EU • Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability • Improving transferability of RDI results to the economy and society • Deepen the ERA through knowledge creation, circulation and use

Table 13: Policy instrument number 9

Digital platforms for engagement and data sharing	
Type of policy instrument	Cooperation-based instrument
Needs	Many R&I policies and projects lack effective mechanisms for continuous engagement and valuable data exchange between relevant stakeholders and local participants. This leads to poor access to reliable, transparent and useful data for further policymaking and the design of innovation projects. From the use cases analyzed in the present document, it can be observed how digital platforms configure an efficient tool for engagement and data sharing. ERA Hubs can support their R&I activity by establishing similar digital platforms for having interactive and accessible spaces that enable multi-stakeholder collaboration and open data sharing which contributes to improve the level of transparency and decision-making. This in turn will improve the perception of stakeholders identified regarding lack of transparent and interactive processes.
Activity	If the design of the platforms is user-friendly, multi-stakeholder engagement and real-time data exchange can be possible. It is crucial to adopt inclusiveness in each feature of the design like multilingual translations, simple interfaces and help assistance for the less non-technical users. Besides this, ERA Hubs should include interactive dashboards or other similar tools for real-time engagement in order to gather rapid input from stakeholders. For the dashboards it is also important to provide visual ones to help stakeholders understand the data insights and how they can contribute to proceed.
Outputs	• **Increased stakeholder participation and diversity:** Human-centric tailored digital platforms provide inclusive and accessible tools for a wider range of stakeholders which can participate. (S2.1 / S2.2 / S3.1 /S3.2) • **Improved level of transparency and trust:** Builds relationships and trust between local governments, businesses, and citizens, creating a unified approach to regional development. (S2.1/ S2.2 / S3.1/ S3.2) • **Better informed decision-making:** Policymakers can improve their policy planning based on evidence gathered from society. Also, individuals can improve their own activity (e.g. DATALOG). (S3.1 / S3.2)
Outcomes	• Testing the ERA Hubs concept • Ensuring new ERA's "smart directionality" • Developing a common platform • Increasing inter- and intra-operability

	• Facilitating talent circulation and absorption • Providing a best practice toolbox
Impacts	• Accelerating the green and digital transformation of the EU • Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability • Improving transferability of RDI results to the economy and society • Deepen the ERA through knowledge creation, circulation and use

Table 14: Policy instrument number 10

Human-centric innovation certification program (Innovative policy instrument)	
Type of policy instrument	Information-based.(Innovative instrument)
Needs	There is a growing emphasis on human-centric values in R&I policies, led by the European Commission. However, there is no standardized way to recognize or reward projects, organizations, or policies that embed Responsible Research and Innovation principles, and human-centric principles, into their processes and outcomes. This gap limits the visibility and adoption of innovations that follow these principles. Moreover, there is some perceived lack of transparency in governance processes that include RRI principles from stakeholders involved in the consultation activities within the ERA_FABRIC project. This certification program offers a unique opportunity to address these challenges by establishing a clear framework to evaluate and recognize R&I projects and policies that align with RRI and human-centric principles.
Activity	The Human-centric innovation certification program would recognize initiatives and organizations that demonstrably embed RRI principles into their innovation processes. Certifications would be awarded based on a transparent and standardized evaluation framework, covering multiple key criteria. Clear benchmarks and criteria would be co-designed with stakeholders, considering factors such as level of stakeholder engagement, societal impact, inclusivity, and ethical governance in innovation projects. The program could include multiple certification levels to recognize varying degrees of human-centric alignment and incentivize continuous improvement among applicants. Certified entities would undergo periodic evaluations to ensure compliance with human-centric standards and maintain their certification status. Certified entities would gain public recognition through ERA Hubs and affiliated programs, along with potential access to exclusive resources.
Outputs	• **Increased visibility of human-centric innovations:** Certification raises awareness of initiatives that prioritize societal impact and RRI principles. (S1.2/ S3.1/ S3.2) • **Continuous improvement**: The tiered certification System motivates participants to progressively enhance their alignment with human-centric principles. (S1.2/ S3.1/ S3.2) • **Access to resources and collaboration opportunities:** Certified entities gain preferential access to exclusive opportunities, enhancing stakeholder engagement and motivating their certification. (S1.2 / S2.2 / S3.1 / S3.2)

Outcomes	• Testing the ERA Hubs concept • Ensuring new ERA's "smart directionality" • Developing a common platform • Increasing inter- and intra-operability • Facilitating talent circulation and absorption • Providing a best practice toolbox
Impacts	• Accelerating the green and digital transformation of the EU • Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability • Improving transferability of RDI results to the economy and society • Deepen the ERA through knowledge creation, circulation and use

Table 15: Innovative policy instrument number 11

Micro-Theory of Change

Deepening the human centricity of R&D and innovation policies	
Needs	• Lack of inclusive stakeholder engagement and misalignment between innovation policies and the diverse societal needs and values that are aimed to serve • Need of having real-world testing environments that integrate user feedback and regional needs • Existing capacity and knowledge gap among stakeholders on how to include RRI values on innovation processes • Insufficient funding and incentives for innovations prioritizing societal impact and inclusivity • Lack of transparent and inclusive mechanisms for stakeholder interaction • Need for having a standardized framework to recognize, validate, and promote innovations that demonstrate alignment with RRI and human-centric principles.
Activity	• Participatory and co-creation mechanisms • Mechanisms to enhance the human perspective from pilot programs • Capacity building and education programs on RRI principles • Targeted financial mechanisms for human-centric innovation • Digital platforms for engagement and data sharing • Human-centric innovation certification program
Outputs	Improved: • R&I collaboration capacities (S1.1) • Access to innovation support services (S1.2) • Governance procedures (S2.1) • Stakeholders' engagement (S2.2) • Funding support (S2.3) • Collaboration culture (S3.1) • Collaboration model (S3.2) • R&I activities outcomes (S3.3)
Outcomes	• Testing the ERA Hubs concept • Ensuring new ERA's "smart directionality" • Developing a common platform • Increasing inter- and intra-operability • Facilitating talent circulation and absorption

	• Providing a best practice toolbox
Impacts	• Accelerating the green and digital transformation of the EU • Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability • Improving transferability of RDI results to the economy and society • Deepen the ERA through knowledge creation, circulation and use

Table 16: Micro-ToC of Deepening the human centricity of R&D and innovation policies

Connecting territories through Smart Specialisation

Policy instruments

Participation in European Networks and Platforms aligned with Strategic Goals	
Type of policy instrument	Planning & Cooperation-based instruments
Needs	Researchers, innovative companies as well as many regional administrations and policy makers collaborate with European partners are internationally networked. However, an effective inter-regional collaboration also needs strong collaboration of quintuple-helix actors within the region. Often there are untapped synergies between the European networks the different regional stakeholders are involved in. The benefits of European networks and projects multiply when the players in the region are well aligned and pool resources and expertise in order to link regional strategies and funding with European excellence research and the translation of its results into the regional economy. "Strengthening the domestic innovation ecosystem around key priorities is a key 'entry condition' for engaging in international collaboration networks and projects, as it provides strong local nodes for interregional collaboration." (Source: S3CoP members of the WG on IC – Policy Brief 2024)
Activity	There is a broad variety of networks and platforms fostering interregional collaboration of innovation actors addressing specific target groups and topics. It is important that regional actors do not get lost, but bundle and mutually reinforce their international activities. ● The first step is to create an overview of the main networks regional actors are involved in, then analyze the quality of the cooperation and identify interfaces and synergies. ● Based on the analysis, actors in the innovation ecosystem can support each other, e.g. by opening doors to new cooperation partners and projects. ● Another option is the joint participation in European calls asking for the active involvement of the whole innovation ecosystem, i.e. science, business and policy makers. ● Last but not least, the region can decide which common topics identified in the analysis it wants to make ERDF/regional funds available for, in order to strengthen interregional cooperation of companies and research institutions.
Outputs	● Affirmed collaboration culture within the region, but also with other European regions (S3.1).

	● Good knowledge transfer based on collaborations (S3.3). ● Public-private collaboration around shared objectives and common strategies for economic and industrial development S3.2). ● There is high alignment of research priorities and industry needs (S1.1).
Outcomes	● Testing the ERA Hubs concept ● Ensuring new ERA's "smart directionality" ● Developing a common platform ● Increasing inter- and intra-operability ● Facilitating talent circulation and absorption ● Providing a best practice toolbox
Impact	● Accelerating the green and digital transformation of the EU ● Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability ● Improving transferability of RDI results to the economy and society ● Deepen the ERA through knowledge creation, circulation and use

Table 17: Policy instrument number 12

Capacity Building and Training for Inter-Regional Collaboration	
Type of policy instrument	Information-based instrument
Needs	European concepts, initiatives and programmes are constantly evolving and have reached a level of specialisation and complexity that makes it very difficult for inexperienced actors to get started without external support. There is a lack of common understanding of concepts and terminology. Interregional cooperation often depends on a few key people whose knowledge is not effectively shared. There is a need to involve regional actors more closely and to improve institutional support.
Activity	ERA-Hubs can ensure efficient support structures with contact persons (NCPs) who not only provide information about calls but can also offer answers to specific questions during the application process. They can provide training for applicants, but also for intermediaries (train-the-trainer scheme) in order to disseminate knowledge as widely as possible. In recent decades, a whole market of consultants has developed for support in the preparation of EU project applications. If new players are to be given fair access to EU programmes, financial support is needed for this external support.
Outputs	● Improved Innovation Support Services (S1.2) ● Professional service providers operating close to universities (e.g., TTOs, IPR experts, incubators, accelerators, etc). (S3.1)
Outcomes	● Testing the ERA Hubs concept ● Ensuring new ERA's "smart directionality" ● Developing a common platform ● Increasing inter- and intra-operability ● Facilitating talent circulation and absorption ● Providing a best practice toolbox
Impact	● Accelerating the green and digital transformation of the EU ● Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability ● Improving transferability of RDI results to the economy and society ● Deepen the ERA through knowledge creation, circulation and use

Table 18: Policy instrument number 13

Financial Support and Incentives for Inter-Regional Collaboration	
Type of policy instrument	Market-based/economic instruments and Public investments
Needs	Collaboration helps regions share knowledge and best practices, fostering innovation and technological advancements. By working together, regions can develop stronger economic ties, leading to increased investment and job creation. Regions can tackle shared issues more effectively. Joint efforts can boost the competitiveness of regional industries on a global scale. Collaboration allows for resource optimization. Various European programmes are available for interregional cooperation. However, the resources are limited. Regions and member states can additionally support co-operation along important value chains with the help of their own or ERDF funds. (Source: S3 CoP Working Group Interregional Collaboration, Leveraging funding for Interregional Collaboration)
Activity	By bringing together the relevant innovation actors, ERA Hubs can help designing and implementing joint interregional calls (such as VINNOVATE, source: Call 2025 | Vanguard Initiative) and then make sure that companies are activated to participate. They can also facilitate the decision which European Partnerships to join. European Partnerships are initiatives in which the EU Commission and private and/or public partners commit themselves to jointly supporting the development and implementation of a research and innovation programme. (Source: www.era-learn.eu).
Outputs	● There is a long-term policy support and availability of well aligned regional, national and European funding for innovation (S2.3) ● Polic makers are aware of the importance and benefits of research and innovation and support interregional collaboration consistent with the needs of private actors (S2,1/S3.2)
Outcomes	● Testing the ERA Hubs concept ● Ensuring new ERA's "smart directionality" ● Developing a common platform ● Increasing inter- and intra-operability ● Facilitating talent circulation and absorption ● Providing a best practice toolbox
Impact	● Accelerating the green and digital transformation of the EU

	● Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability ● Improving transferability of RDI results to the economy and society ● Deepen the ERA through knowledge creation, circulation and use

Table 19: Policy instrument number 14

Better Communication, Mapping and Information Sharing	
Type of policy instrument	Cooperation-based instruments and Information-based instruments
Needs	Many projects are still implemented in isolation and do not have an impact beyond duration and consortium. A good overview of interregional projects and collaborations of regional actors is needed, a mapping of interesting results and the identification of synergies and gaps. There is a lot of communication about bureaucratic burden, little about benefits of interregional collaboration. There is a need for better communicating results and impact, not only on a project-level but on a "portfolio-level" for the regional innovation ecosystem.
Activity	The main point of this policy instrument is improving information and communication. ERA Hubs can help mapping existing projects (e.g. RIS3-MCAT Platform Catalonia), facilitate peer learning or peer reviews to assess the quality and effectiveness of projects, allowing for adjustments and improvements. It can support comprehensive impact assessments to evaluate the long-term benefits and sustainability of projects and last but not least the impact of European collaboration on the region.
Outputs	● Good knowledge transfer and use of synergies based on portfolio management of European collaborations (S3.1 / S3.3) ● Better communication of value added to interregional collaboration due to improved mapping and evaluation of projects. (S2.1 / S2.2 / S3.1 / S3.3)
Outcomes	● Testing the ERA Hubs concept ● Ensuring new ERA's "smart directionality" ● Developing a common platform ● Increasing inter- and intra-operability ● Facilitating talent circulation and absorption ● Providing a best practice toolbox
Impact	● Accelerating the green and digital transformation of the EU ● Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability ● Improving transferability of RDI results to the economy and society ● Deepen the ERA through knowledge creation, circulation and use

Table 20: Policy instrument number 15

Participatory and Co-Creation Processes	
Type of policy instrument	Cooperation-based instruments
Needs	Engaging stakeholders is needed to build trust and social capital within and between regions. This trust is essential for successful collaboration, as it fosters commitment to the projects. It also encourages continuous engagement and cooperation, leading to more sustainable and impactful outcomes. Stakeholders need to work together to develop joint strategies and solutions to tackle common issues more effectively. This collaborative effort ensures that resources are used efficiently and that solutions are tailored to the specific needs of each region.
Activity	This policy instrument is about setting up participatory processes and co-creation sessions with stakeholders as part of European collaboration. ERA Hubs can facilitate innovation forums bringing together businesses, research institutions, public authorities and civil society representatives to discuss common challenges and opportunities. They can organize hackathons and innovation challenges to encourage creative solutions to shared problems. This fosters a sense of ownership and commitment to collaborative efforts and anchors interregional collaboration on common regional needs. By showcasing successful interregional projects and highlighting the benefits of collaboration, stakeholders are motivated to participate and contribute their expertise.
Outputs	● Affirmed collaboration culture among different stakeholder types within the region and between regions based on shared objectives and supported by the regional policy makers (S3.1 / S3.2 / S3.3) ● Effective European collaboration fostering challenge driven innovation involving lead companies and entrepreneurs (S3.2)
Outcomes	● Testing the ERA Hubs concept ● Ensuring new ERA's "smart directionality" ● Developing a common platform ● Increasing inter- and intra-operability ● Facilitating talent circulation and absorption ● Providing a best practice toolbox
Impact	● Accelerating the green and digital transformation of the EU ● Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability ● Improving transferability of RDI results to the economy and society ● Deepen the ERA through knowledge creation, circulation and use

Table 21: Policy instrument number 16

Participatory and Co-Creation Processes	
Type of policy instrument	Cooperation-based instruments
Needs	Engaging stakeholders is needed to build trust and social capital within and between regions. This trust is essential for successful collaboration, as it fosters commitment to the projects. It also encourages continuous engagement and cooperation, leading to more sustainable and impactful outcomes. Stakeholders need to work together to develop joint strategies and solutions to tackle common issues more effectively. This collaborative effort ensures that resources are used efficiently and that solutions are tailored to the specific needs of each region.
Activity	This policy instrument is about setting up participatory processes and co-creation sessions with stakeholders as part of European collaboration. ERA Hubs can facilitate innovation forums bringing together businesses, research institutions, public authorities and civil society representatives to discuss common challenges and opportunities. They can organize hackathons and innovation challenges to encourage creative solutions to shared problems. This fosters a sense of ownership and commitment to collaborative efforts and anchors interregional collaboration on common regional needs. By showcasing successful interregional projects and highlighting the benefits of collaboration, stakeholders are motivated to participate and contribute their expertise.
Outputs	● Affirmed collaboration culture among different stakeholder types within the region and between regions based on shared objectives and supported by the regional policy makers (S3.1 / S3.2 / S3.3) ● Effective European collaboration fostering challenge driven innovation involving lead companies and entrepreneurs (S3.2)
Outcomes	● Testing the ERA Hubs concept ● Ensuring new ERA's "smart directionality" ● Developing a common platform ● Increasing inter- and intra-operability ● Facilitating talent circulation and absorption ● Providing a best practice toolbox
Impact	● Accelerating the green and digital transformation of the EU

	● Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability ● Improving transferability of RDI results to the economy and society ● Deepen the ERA through knowledge creation, circulation and use

Table 22: Policy instrument number 17

Think Global Act Local *(Innovative instrument)*	
Type of policy instrument	Planning instruments, Market-based/economic instruments, Public investments, Cooperation-based instruments and Information-based instruments
Needs	Facing multiple global challenges, it is even more important to empower local communities to become active in their environment. There is a lot of local knowledge and experience available in neighborhood initiatives, micro businesses, etc. It is absolutely important to mobilize this local expertise and niche innovations to solve societal challenges. However, this local community is not necessarily connected to the European level. These grassroots movements should not remain isolated but reinforce each other and leverage results to higher levels. On one hand, there is a need to build capacities of local actors to become part of the European innovation ecosystem. On the other hand, policy makers need to rethink their programmes to make it more attractive to local communities.
Activity / Intervention	The European Partnership 'Driving Urban Transition' serves as an excellent example of a funding programme that combines local implementation, national funding and European cooperation: 1. European Partnership: Funding agencies and ministries from all European countries join forces using national funds for interregional collaboration for solving common societal challenges, here: green urban transformation. 2. Introduction of funding requirements fostering civil society engagement, e.g. the obligation to include local public administration and other urban actors in the consortia. 3. Establishing "arenas" for structured exchange and collaboration between programme owners and local stakeholders, e.g. city panels to set priorities and reflect results with regional/local policy makers and public administration, agora to have strategic discussions all kinds of local stakeholders, etc. 4. Setting up small scale grants to empower and build capacity of local initiatives and allow for local co-creation (e.g. "Urban Doers") (Source: Johannes Riegler, Driving Urban Transitions, ERA_Fabric Webinar Human Centricity of R&D & Innovation Policies: Video - ERA FABRIC; Urban

	Doers Community Policy Paper: New Publication: Urban Doers Community Policy Paper - DUT Partnership)
Outputs	● Civil society, private and public actors collaborate towards shared goals with a common focus on environmental sustainability (S1.2 / S2.2) ● Major steps forward are achieved by inclusive and forward-looking governance, based on interactive and inclusive processes (S1.3, S2.3) ● Long-term policy support and availability of regional / national funding for innovation (S2.3). ● Improved collaboration culture among different stakeholder groups within the region and between regions (S3.1 / S3.2 / S3.3) ● Local level / civil society is directly involved in the project and therefore well informed about the results and benefits (S3.3)
Outcomes	● Testing the ERA Hubs concept ● Ensuring new ERA's "smart directionality" ● Developing a common platform ● Increasing inter- and intra-operability ● Facilitating talent circulation and absorption ● Providing a best practice toolbox
Impact	● Accelerating the green and digital transformation of the EU ● Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability ● Improving transferability of RDI results to the economy and society ● Deepen the ERA through knowledge creation, circulation and use

Table 23: Innovative policy instrument number 18

Micro-Theory of Change

Connecting territories through Smart Specialisation complementarities	
Needs	• Lack of internal regional coordination across networks, which leads to fragmentation in participation and lack of strategic alignment • Insufficient institutional and knowledge capacity for interregional engagement • Lack of inclusive governance mechanisms for collaboration, needing participatory spaces for co-design and mutual learning • Limited financial instruments to support interregional collaboration • Poor visibility and communication of collaboration benefits • Underutilized local knowledge and grassroots innovation • Lack of structured learning mechanisms across regions • Insufficient support for embedding S3 in European Partnerships
Activity	• Participation in European networks and platforms aligned with strategic goals • Capacity building and training for inter-regional collaboration • Financial support and incentives for inter-regional collaboration • Better communication, mapping and information sharing • Participatory and co-creation processes • Think global act local
Outputs	Improved: • R&I collaboration capacities (S1.1) • Access to innovation support services (S1.2) • Governance procedures (S2.1) • Stakeholders' engagement (S2.2) • Funding support (S2.3) • Collaboration culture (S3.1)

	• Collaboration model (S3.2) • R&I activities outcomes (S3.3)
Outcomes	• Testing the ERA Hubs concept • Ensuring new ERA's "smart directionality" • Developing a common platform • Increasing inter- and intra-operability • Facilitating talent circulation and absorption • Providing a best practice toolbox
Impacts	• Accelerating the green and digital transformation of the EU • Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability • Improving transferability of RDI results to the economy and society • Deepen the ERA through knowledge creation, circulation and use

Table 24: Micro-ToC of Connecting Territories through Smart Specialisation

Promoting a single market for green and digital transition

Policy instruments

Large-Scale, Targeted Funding Mechanisms	
Type of policy instrument	Public investment instrument
Needs	Large-scale targeted funding mechanisms such as the Recovery and Resilience Facility (RRF) aims to mitigate the impact of the COVID-19 pandemic and accelerate the green and digital transitions through national Recovery and Resilience Plans (RRPs). However, ensuring these national plans effectively translate into impactful, place-based investments that leverage regional R&I strengths presents a challenge. Local support actions can offer a significant opportunity to bridge this gap by connecting national objectives with the specific needs and innovation potential of regional ecosystems.
Activity	Access to large-scale targeted funding mechanisms is contingent upon the submission and approval of concerted national plans that must detail a coherent package of reforms and public investments to be implemented in a given period of time, identifying minimum spending targets spread across twin transition objectives. Supported projects span a wide range, including investments in clean technologies, renewable energy, energy efficiency (e.g., building renovation), sustainable transport, digital connectivity (broadband, 5G), digitalisation of public administration and businesses, and digital skills development. Cross-regional ERA Hubs can support regional R&I twin transition initiatives, skills development and SME digitalisation efforts identified within Recovery and Resilience Plans adopted by participating regions. This would ensure better alignment with regional priorities, such as those outlined in Smart Specialisation Strategies, and leverage the Hubs' capacity for quadruple/quintuple helix collaboration.
Outputs	● Improved impact measurement mechanisms and pilot actions: focus group sessions in regions ensures impact measurement schemes are shared, harmonised and agreed upon (S1.1 / S2.1) ● Improved Feedback and Monitoring activities: collection of regional-level data, qualitative feedback on diverse regions' project implementation supports regional authorities in verifying the achievement of specific milestones and targets related to R&I and the twin transition (S2.3 / S3.1) ● Higher level of policy integration and sustainability: regional communication and coordination points facilitates interaction between

	national managing authorities and local project implementers (S2.3 / S3.1 / S3.2)
Outcomes	● Testing the ERA Hubs concept ● Ensuring new ERA's "smart directionality" ● Developing a common platform ● Increasing inter- and intra-operability ● Facilitating talent circulation and absorption ● Providing a best practice toolbox
Impacts	● Accelerating the green and digital transformation of the EU ● Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability ● Improving transferability of RDI results to the economy and society ● Deepen the ERA through knowledge creation, circulation and use

Table 25: Policy instrument number 19

Funding Mechanisms for Just Transition Towards a Climate-Neutral Economy	
Type of policy instrument	Public investment instrument
Needs	The transition towards a climate-neutral economy, while beneficial for the EU overall, poses significant socio-economic challenges for specific regions and sectors heavily dependent on fossil fuels (like coal, peat, oil shale) or greenhouse gas-intensive industrial processes. These regions often have less capacity to absorb the costs of transition, risking job losses, economic decline, and widening regional disparities. Funding Mechanisms for Just Transition address this by aiming to ensure a "just transition," ensuring fairness and that "no one is left behind". Such schemes provide an opportunity to support economic diversification, foster new sustainable industries, create quality jobs, and reskill the affected workforce.
Activity	This policy is fueled by a combination of public and private funding, structured around two pillars: 1. Direct financial support to the most affected territories for a range of activities aimed at alleviating the socio-economic costs. Eligible interventions include investments in SMEs and start-ups for economic diversification, creation of new firms, research and innovation activities. 2. Investments in energy and transport infrastructure, decarbonisation projects, district heating networks, building renovation, and social infrastructure, aiming to attract significant sustainable investments into eligible regions. ERA Hubs in eligible territories could be formally mandated as central actors in the co-creation and implementation of Just Transition Plans, ensuring R&I perspectives are embedded in regional transition strategies. Specific budget lines could be allocated for collaborative R&I projects, specialised skills programmes linked to ERA Actions, and innovation support services managed or coordinated by the ERA Hub. ERA Hubs could act as regional intermediaries, guiding local stakeholders (SMEs, research centres, public bodies) towards the most appropriate funding pillar for their needs.

Outputs	● Integrated R&I facilitation within funding mechanisms: kickstart of regional platform for the multi-stakeholder dialogue on Just Transition Funding Mechanism (S1.1 / S2.2 / S2.3). ● Supported R&I priorities: promotion of key R&I needs in transition territories highlights needs of SMEs, research centres, public bodies (S2.3/ S3.2). ● Fostered inter-regional connections: Publication of lessons learnt, structured KPIs, comprehensive case study portfolio highlights R&I interventions (S3.3)
Outcomes	● Testing the ERA Hubs concept ● Ensuring new ERA's "smart directionality" ● Developing a common platform ● Increasing inter- and intra-operability ● Facilitating talent circulation and absorption ● Providing a best practice toolbox
Impacts	● Accelerating the green and digital transformation of the EU ● Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability ● Improving transferability of RDI results to the economy and society ● Deepen the ERA through knowledge creation, circulation and use

Table 26: Policy instrument number 20

Regulatory Sandboxes for Twin Transition Technologies	
Type of policy instrument	Regulatory Instrument
Needs	The accelerated pace of innovation inherent in the Twin Transition, especially concerning disruptive digital technologies (AI, IoT, blockchain) applied to environmental challenges or used in novel sustainable ways, often outstrips the capacity of traditional regulatory frameworks to adapt. This creates significant legal uncertainty for innovators, potentially hindering the development and market entry of beneficial solutions. Existing regulations, designed for established technologies and business models, may inadvertently block or unduly burden innovative approaches necessary for achieving breakthroughs in areas like deep decarbonisation, resource efficiency, or sustainable digital infrastructure. There is a clear opportunity to create controlled environments where such innovations can be tested safely and effectively, allowing regulators and innovators to learn collaboratively. This experimentation can help reconcile potentially conflicting policy goals (e.g., maximizing data use for environmental monitoring vs. upholding strict privacy standards) and generate empirical evidence to guide the evolution of future-proof regulations.
Activity	The proposed instrument involves establishing Regulatory Sandboxes specifically designed for twin transition innovations. These are legally defined frameworks that allow selected companies or research organisations to test innovative products, services, processes, or business models in a live market environment for a limited duration, under specific conditions, and with regulatory flexibility. This flexibility might involve temporary waivers or modifications of certain existing regulatory requirements, granted under the close supervision of competent authorities. ERA Hubs can play a role in supporting cross-regional sandboxes that would target specific Twin Transition challenges or technology areas (e.g., AI for smart grids, blockchain for circular supply chains, sustainable data centre technologies) and ensure transparent criteria for selecting participants based on the innovativeness, potential impact (both positive and negative) and maturity of proposal. ERA Hubs can also engage with key ecosystem players such as AI Factories, European Digital Innovation Hubs (EDIHs), Testing and Experimentation Facilities (TEFs), and other relevant EU initiatives (such as the EUSAiR project) to enhance the intervention impact.

Outputs	● Integrated Regulatory Sandbox initiatives: connection between represented ecosystems and national authorities responsible for sandbox regulation ensures identification and engagement of key R&I players within represented ecosystems (S2.1 / S2.2). ● Co-created Policy: support to key R&I players within pilot sandboxes in areas identified as high-priority for the twin transition ensures consistency of experimentation and feedback collected within pilot sandboxes to facilitate cross-border learning (S2.1 / S2.2 / S3.1). ● Improved policy scalability to national level and EU orchestration: promotion of case studies from regional ecosystems supports the uptake of common regulatory tools that can be discussed between different national and EU-level authorities (S2.1 / S2.2 / S3.2).
Outcomes	● Testing the ERA Hubs concept ● Ensuring new ERA's "smart directionality" ● Developing a common platform ● Increasing inter- and intra-operability ● Facilitating talent circulation and absorption ● Providing a best practice toolbox
Impacts	● Accelerating the green and digital transformation of the EU ● Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability ● Improving transferability of RDI results to the economy and society ● Deepen the ERA through knowledge creation, circulation and use

Table 27: Policy instrument number 21

Micro-Theory of Change

Promoting a single market for the green and digital transition	
Needs	• Mismatch between national funding priorities and regional innovation capabilities • Social disparities in transition readiness: certain regions and sectors face disproportionate socio-economic challenges during the shift to climate neutrality, lacking the resources to adapt or reskill effectively • Regulatory lag: Rapid innovation in twin transition technologies often outpaces existing regulations, creating uncertainty • Limited integration of R&I in funding instruments: Regional innovation and research capacities are often not fully leveraged in transition-related funding, missing opportunities for systemic change • Fragmentation of policy implementation: National and regional efforts towards the green and digital transition lack coordinated mechanisms to ensure consistency and mutual reinforcement
Activities	• Large-scale, targeted funding mechanisms • Funding mechanisms for just transition towards a climate-neutral economy • Regulatory sandboxes for twin transition technologies
Outputs	Improved: • R&I collaboration capacities (S1.1) • Access to innovation support services (S1.2) • Governance procedures (S2.1) • Stakeholders' engagement (S2.2) • Funding support (S2.3) • Collaboration culture (S3.1) • Collaboration model (S3.2) • R&I activities outcomes (S3.3)
Outcomes	• Testing the ERA Hubs concept • Ensuring new ERA's "smart directionality" • Developing a common platform • Increasing inter- and intra-operability • Facilitating talent circulation and absorption • Providing a best practice toolbox
Impacts	• Accelerating the green and digital transformation of the EU • Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability • Improving transferability of RDI results to the economy and society • Deepen the ERA through knowledge creation, circulation and use

Table 28: Micro-ToC of Promoting a single market for the green and digital transition

ERA Hubs Theory of Change

The Theory of Change for ERA Hubs serves as a comprehensive strategic and operational framework to guide the implementation of the ERA Hubs concept across European regions. It reflects the European Union's commitment to reinforcing R&I ecosystems through excellence, inclusivity, knowledge circulation, and societal relevance. The ERA Hubs ToC aligns systemic needs with targeted interventions to facilitate structural transformation in R&I governance and performance. It acts both as a strategic blueprint and a policy toolbox, enabling Quintuple Helix stakeholders to co-create innovation ecosystems that are more effective and responsive to local and European priorities.

The ToC framework adopts a results chain logic and is structured across the four previously-developed strategic pillars: (1) Enhancing the local impacts and synergies of EU framework programme project results, (2) Deepening the human centricity of R&D and innovation policies, (3) Connecting territories through smart specialisation complementarities, and (4) promoting a single market for the green and digital transition. Each developed pillar includes a cluster of micro-Theories of Change, corresponding to a set of co-designed policy instruments that collectively operationalize the ERA Hubs Theory of Change.

ERA Hubs ToC	
Needs	● EU-funded programs often fail to generate impact at the local level due to lack of stakeholder involvement ● Key local actors of the Quintuple Helix are not effectively mobilized ● Regions lack knowledge and skills to adapt EU initiatives to local realities ● There is a gap between project design and practical, real-world implementation ● Communication between EU implementers and local stakeholders is inefficient ● Financing mechanisms often exclude small-scale, community-led initiatives ● Regional ecosystems are often isolated and need structured interregional knowledge transfer ● R&I policies often do not reflect the values and diversity of societal actors ● Innovation processes lack real-world testing environments that include user feedback ● There is a knowledge and capacity gap regarding Responsible Research and Innovation ● Current funding mechanisms overlook societal impact and inclusivity

	• Engagement and data-sharing mechanisms are often neither inclusive nor transparent • No standards exist to recognize or promote RRI-compliant innovations • Lack of alignment between regional actors' international activities and regional priorities • Missed synergies in European network participation • Limited awareness and institutional capacity for interregional collaboration • Lack of financial incentives and support structures for interregional collaboration • Fragmented communication around the benefits and outcomes of interregional collaboration • Civil society and local actors are not sufficiently mobilized or integrated into cooperation processes • National plans often do not align with regional innovation strengths • Vulnerable regions face disproportionate socio-economic barriers in the twin transition • Regulatory frameworks lag behind fast-evolving twin transition technologies • Funding instruments do not sufficiently integrate regional R&I capacities • Lack of coherence between national and regional policy actions on twin transitions
Activities	• Participatory governance mechanisms at local level to promote local stakeholder collaboration • Capacity building and education programs on enhancing local impact • Pilot programs and demonstration project mechanisms at local level • Digital platforms for local engagement • Tailored financing mechanism for initiatives with local impact • Cross-regional mobility schemes • Participatory and co-creation mechanisms integration • Mechanisms to enhance the human perspective from pilot programs • Capacity building and education programs on RRI principles • Targeted financial mechanisms for human-centric innovation • Digital platforms for engagement and data sharing • Human-centric innovation certification program • Participation in European networks and platforms aligned with strategic goals

	● Capacity building and training for inter-regional collaboration ● Financial support and incentives for inter-regional collaboration ● Better communication, mapping and information sharing ● Participatory and co-creation processes for inter-regional collaboration ● Think global, act local ● Large-scale, targeted funding mechanisms ● Funding mechanisms for just transition towards a climate-neutral economy ● Regulatory sandboxes for twin transition technologies
Outputs	Improved: ● R&I Collaboration capacities (S1.1) ● Innovation support services (S1.2) ● Governance (S2.1) ● Stakeholders' engagement (S2.2) ● Funding support (S2.3) ● Collaboration culture (S3.1) ● Collaboration model (S3.2) ● R&I Activities outcomes (S3.3)
Outcomes	● Testing the ERA Hubs concept ● Ensuring new ERA's "smart directionality" ● Developing a common platform ● Increasing inter- and intra-operability ● Facilitating talent circulation and absorption ● Providing a best practice toolbox
Impacts	● Accelerating the green and digital transformation of the EU ● Improving access to excellence and increase the performance of RDI systems in compliance with Smart Specialization Strategies for Sustainability ● Improving transferability of RDI results to the economy and society ● Deepen the ERA through knowledge creation, circulation and use

Table 29: ERA Hubs Theory of Change

CONCLUSIONS

The Theory of Change presented in this deliverable emerges as a multidimensional framework designed to concretely operationalize the ERA Hubs concept. It acts simultaneously as a strategic vision and a pragmatic implementation guide that reflects the ambitions of an innovation-driven and sustainable Europe. By grounding itself in a backward mapping logic – from long-term impacts to foundational needs – this ToC ensures that interventions are systematically aligned with the evolving challenges of R&I systems and the strategic orientations of the ERA.

One of the core strengths of this Theory of Change lies in its deep contextual awareness of the systemic obstacles that limit the optimal functioning of European regional innovation ecosystems. The identification of needs was not based solely on theoretical assumptions, but rather in a solid and participatory evidence base, incorporating more than 150 stakeholders' inputs across methodologies such as surveys, workshops, and consultation exercises. This inclusive process guarantees that the subsequent layers of the ToC – from activities to impacts – are firmly rooted in real-world insights and reflect the diverse voices of actors within the Quintuple Helix, ranging from civil society and academia to industry and public authorities.

The ToC advances a novel yet methodologically rigorous model built around the four ERA_FABRIC interlinked strategic pillars. Each of these dimensions has been translated into a cluster of co-created micro-Theories of Change, each anchored in a tailored policy instrument. Altogether, 21 instruments have been carefully constructed, incorporating a wide typology of tools. Their implementation logic is structured to produce tangible outputs, trigger adaptive outcomes, and contribute to a systemic, long-term transformation. The operationalization of these policy instruments demonstrates the maturity of ERA Hubs design logic. Outputs across the different pillars reflect clear and measurable transformations at the regional level. Importantly, they converge around a unifying goal: to reorient fragmented innovation landscapes towards the "ideal type" ERA Hub as defined in the project. These Hubs are envisioned not as static entities but as dynamic, context-sensitive mechanisms capable of responding to regional particularities while remaining aligned with European-level strategic priorities.

Moreover, the ToC demonstrates how such outputs generate a cascade of interconnected outcomes. In doing so, it bridges the gap between the design of innovation policy and its practical, locally adapted application. Thus, the outcomes reaffirm the role of ERA Hubs as transformative anchors in the European innovation landscape. The anticipated impacts of this Theory of Change reflect its ambition to contribute meaningfully to overarching EU goals. These impacts are not seen as distant aspirations but as attainable trajectories conditioned upon the successful and context-sensitive deployment of the identified instruments.

This deliverable positions the ERA Hubs Theory of Change as a living, adaptable framework that synthesizes analytical rigor with policy relevance and actionable guidance. It demonstrates that the transformation of Europe's R&I ecosystems requires a blend of participatory governance, targeted financial and educational interventions, inclusive digital engagement, and strategic regulatory innovation. It also illustrates the critical importance of integrated governance structures that can navigate across levels of actions – from the grassroots to the supranational – and promote synergies among fragmented efforts.