I4-GREEN

SME Guide on Transition Support Instruments

D5.3

17/10/2024

Authors: Anna Jorquera, Alicia García

Entity: ISMC

Funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or EISMEA. Neither the European Union nor the granting authority can be held responsible for them.

General information				
Work Package	WP5			
Deliverable	D5.3			
Due Data	M24 (October 2024)			
Submission Date	17/10/2024			
Deliverable Lead	ISMC			
Dissemination Level	X	Public (PU)		Confidential (CO)
Document Nature	X	Report (R)		Other (O)
Description of the related task and the deliverable. Extract from DoA	T5.3 Integration of circular & sustainability practices within SMEs (M18-M24) Lead Beneficiary: ISMC, Contributors: ACPMR This task will consist in building sustainable capacity within SMEs and will be threefold: 1/ […] 2/ Transition support instruments. A compilation of specialisation analyses (incl. RIS3, regional policy, etc.) will allow for the identification of available financial instruments at EU and sub-EU levels (regional/national) that can support the transition toward circular and sustainable models. Potential sources can be identified in regional policy mixes but also thanks to more advanced programmes such as LIFE+, ETS Innovation Fund, Cohesion funds, Horizon Europe, ESIF, EFSI, Innovation and Modernization Fund. Cluster collaborations tools like the European Cluster Collaboration Platform (ECCP) and the European Strategic Cluster Partnerships (ECSP) but also the liaisons developed with INNOSUP-01 MINE.THE.GAP will be mobilized. Special emphasis will be put on the Strategic Implementation Plan compiled by the European Innovation Partnership in Raw Materials (to which ICA, ISMC and ACPMR are taking part – operational groups). 3/ […]			
Authors	Anna Jorquera, Alicia García			
Reviewers	María Fernández, Álvaro de Diego, Santiago Cuesta-López			
Status		Draft	X	Final

Revision History				
Version	Date	Author	Organisation	Status
v1	27/09/2024	Anna Jorquera, Alicia García	ISMC	Draft
V1.1	08/10/2024	Ramón Cabrera, Adriana Gutiérrez	ICA	Draft
V1.1	11/10/2024	André Carvalho, Giulia Resta, Marta Peres, Luís Martins	ACPMR	Draft
V2	11/10/2024	Anna Jorquera, Alicia García, María Fernández, Álvaro de Diego, Santiago Cuesta-López	ISMC	Final

TABLE OF CONTENTS

INDEX

List of Figures		
Figure 1	European funding instruments	14
Figure 2	ESI Funds instruments	15
Figure 3	Structure of Horizon Europe and EURATOM	19

List of Tables		
Table 1	RIS3 objectives and description	8
Table 2	RIS3 implementation process	9
Table 3	Specialisation analyses' key impacts on regional policy	10
Table 4	RIS3 strategies of the I4-GREEN regions	11
Table 5	RIS3 mining priorities in the I4-GREEN regions	11
Table 6	Pillars of the SIP	12
Table 7	Spanish National and Regional Funding in the I4-GREEN Regions	26
Table 8	Portuguese National and Regional Funding in the I4-GREEN Regions	27
Table 9	Usual components of a regional policy mix	28
Table 10	Potential sources for transition support within regional policy mixes	28
Table 11	Cluster collaboration tools' key support points	31

Glossary	
Acronym	Meaning
EU	European Union
RIS3	Research and Innovation Strategies for Smart Specialization
ESI	European Structural and Investment
ESFI	European Fund for Strategic Investments
ECCP	European Cluster Collaboration Platform
ESCP	European Strategic Cluster Partnerships
SMEs	Small and Medium Enterprises
SIP	Strategic Implementation Plan
MMF	Multiannual Financial Framework

ERDF	European Regional Development Funds
EDP	Entrepreneurial Discovery Process
R&D	Research and Development
ICT	Information and Communication Technology
EIPs	European Innovation Partnerships
STEP	Strategic Technologies for Europe Platform
MSs	Member States
PO	Policy Objective
I3	Interregional Innovation Investments
S3	Smart Specialisation Strategies
ESF	European Social Fund
CF	Cohesion Fund
HE	Horizon Europe
EIT	European Institute of Innovation and Technology
KICs	Knowledge and Innovation Communities
EIT RIS	EIT Regional Innovation Scheme
EIC	European Innovation Council
TRL	Technology Readiness Level
ETS	Emissions Trading System
CCUs	Carbon Capture, Use and Storage
EIB	European Investment Bank
EIF	European Investment Fund
ECCP	European Cluster Collaboration Platform
ESCP	European Strategic Cluster Partnerships

Executive summary

This report provides a comprehensive analysis of transition support instruments aimed at promoting the shift toward circular and sustainable economic models, specifically in the raw materials sector. The focus is on identifying financial instruments available at EU and sub-EU (regional and national) levels that can assist in the transition. Through the evaluation of Research and Innovation Strategies for Smart Specialization (RIS3) and regional policy mixes, key financial resources are identified to support sustainability initiatives.

Advanced EU programs such as LIFE+, the ETS Innovation Fund, Cohesion Funds, Horizon Europe, European Structural and Investment Funds (ESIF), the European Fund for Strategic Investments (EFSI), and the Innovation and Modernization Fund are highlighted as vital funding sources. These programs enable innovation and investment in sustainable infrastructure, energy efficiency, and green technologies, directly contributing to the transition goals.

In addition to financial instruments, cluster collaboration tools—such as the European Cluster Collaboration Platform (ECCP) and the European Strategic Cluster Partnerships (ESCP)—play a critical role in fostering cross-sector partnerships and innovation. The report also leverages insights from initiatives like INNOSUP-01 MINE.THE.GAP, which connects clusters and SMEs in the raw materials sector to support sustainable development.

This analysis aims to equip stakeholders with the necessary knowledge to access funding and collaboration opportunities that drive the green transition across Europe's regions, sectors, and industries, particularly in critical raw material extraction and processing sectors.

1. Introduction

Raw materials are essential to the global economy and particularly to sectors that support the green and digital transitions, such as renewable energy, electric vehicles, and advanced manufacturing. However, the sustainability of raw material extraction and processing is becoming increasingly critical as environmental, social, and governance concerns rise. This report focuses on the sustainability of raw materials, examining the financial and policy instruments that can support the shift toward more sustainable, responsible, and circular practices in this sector.

A thorough analysis of specialization strategies—such as RIS3 -along with EU and sub-EU financial instruments-, will be conducted to identify resources available for promoting sustainability in raw material extraction and processing. Additionally, advanced programs such as LIFE+, the ETS Innovation Fund, Cohesion Funds, Horizon Europe, ESIF, and the Innovation and Modernization Fund will be reviewed for their role in fostering sustainability.

1.1. Objectives & Methodology

The objectives of this report are to:

- Identify Funding Instruments for Sustainability: To compile and analyse the financial instruments at the EU and sub-EU levels that support the sustainable management of raw materials. This will include advanced EU funding sources like the ETS Innovation Fund, LIFE+, and Horizon Europe, which can help drive sustainability in mining and raw material processing.
- Examine Regional Specialization Strategies: To assess how regional policies and specialization strategies, such as RIS3, contribute to advancing sustainability in raw material extraction and support access to relevant funding opportunities.
- Promote Circular Economy Practices: To identify financial mechanisms that promote circular economy models within the raw materials sector, such as recycling and re-mining projects, supported by programs like the Innovation and Modernization Fund.

- Foster Cross-Sector Collaboration: To explore the role of clusters and partnerships, such as the European Cluster Collaboration Platform (ECCP) and European Strategic Cluster Partnerships (ESCP), in driving innovation and sustainability within the raw materials sector.
- Align with the Strategic Implementation Plan (SIP): To ensure that financial instruments align with the Strategic Implementation Plan of the European Innovation Partnership on Raw Materials, supporting sustainable innovation in critical sectors like mining and recycling of raw materials.

By achieving these objectives, this report will provide a comprehensive overview of the financial instruments and policy frameworks available to support the sustainability of raw materials, specifically within the I4-GREEN regions, ensuring that the sector aligns with the EU's Green Deal and circular economy goals. The focus on raw material sustainability ensures that Europe can secure its supply of critical resources while reducing environmental impacts and enhancing social responsibility in extraction and processing.

Limitations to the study have been the complex and interrelated landscape of European funding. The most interesting instruments have been selected and included in this report. Likewise, the European, national and regional instruments included in this report are a compilation of the most impactful ones for SMEs in the raw materials sector.

The calls selected and included at the end of this report are limited to the ones posteriors to time of publication of this report (October 2024) and extend only to 2025. For this reason, it was deemed important to include a structured review of the available instruments within the 2021-2017 MMF, to facilitate to the SMEs the search for funding opportunities past this timeline.

2. Overview of the RIS3

RIS3 (Research and Innovation Strategies for Smart Specialisation) It is a key policy concept developed by the European Union (EU) to promote economic transformation through innovation-driven growth, and its strategies are relevant to EU policies, such as EU Cohesion Policy, and EU funding (for instance, the European Regional Development Funds (ERDF) of the ESIF). It is a place-based innovation strategy that helps regions identify and develop their unique strengths and innovation potential. It encourages regions to specialize in areas that offer the most significant growth opportunities, leveraging their competitive advantages. Its focus is on maximizing the impact of public investment in research and innovation by concentrating resources in specific sectors.

The objectives of RIS3 are presented in table 1:

Boost Regional Innovation	Encourage regions to innovate by focusing on their strengths and investing in research and development (R&D) in priority areas.
Increase Economic Competitiveness	Support regions in enhancing their competitive edge in the global market by developing niche areas of specialisation.
Promote Sustainable Growth	Align regional development with sustainability goals, ensuring that economic growth is both inclusive and environmentally sound.
Improve Policy Coherence	Integrate regional, national, and EU-level policies to foster synergies and avoid policy fragmentation.

Table 1: RIS3 objectives and description

RIS3 is a precondition (known as an *ex-ante conditionality*) for regions to access EU funding from the European Structural and Investment Funds (ESI Funds), especially the ERDF. Regions must develop and implement RIS3 to be eligible for ERDF funding that supports innovation, research, and technology development.

2.1. Smart Specialisation and RIS3 Strategies

The idea behind smart specialisation is to encourage regions to identify and build upon their existing strengths and capabilities, rather than attempting to develop entirely new industries from scratch. This approach is designed to foster innovation and competitive advantage in areas where regions have the potential to excel. The Entrepreneurial Discovery Process (EDP) is a central element of RIS3. It involves a participatory process that engages stakeholders—such as businesses, research institutions, public authorities, and civil society—in identifying and selecting priorities for regional development. This collaborative process ensures that the strategies are grounded in the needs and potential of the local economy.

RIS3 strategies are built on rigorous analysis of regional assets, capabilities, and potential. This involves mapping regional assets and assessing the economic landscape to identify unique opportunities and challenges. Continuous monitoring and evaluation are integral to RIS3. Regions are encouraged to track progress, assess the impact of their strategies, and make adjustments as necessary. This iterative process helps refine strategies and ensure that they remain relevant and effective over time.

The strategy involves prioritising investments in specific domains, technologies, or industries where a region has potential for excellence and competitive advantage. This focused approach is meant to avoid the scattering of resources across too many sectors.

Furthermore, RIS3 is part of the EU's Cohesion Policy, which aims to reduce disparities between regions within the EU. By aligning regional innovation strategies with broader EU objectives, RIS3 helps ensure that regional policies contribute to overarching goals like sustainability, innovation, and inclusiveness.

Each EU member state and region is required to develop its own RIS3 strategy as a condition for accessing EU Structural and Investment Funds. The implementation process involves several steps, presented in table 2.

1	Analysis of Regional Context	Assessing the regional economic, social, and innovation landscape to identify existing assets and opportunities.
2	Governance and Stakeholder Involvement	Establishing a governance framework that includes a wide range of stakeholders in the decision-making process to ensure that strategies are comprehensive and inclusive.
3	Priority Setting	Identifying and selecting strategic priorities based on regional strengths and potential for growth.
4	Action Plan Development	Creating a detailed action plan that outlines specific measures, projects, and funding allocations to achieve the strategic objectives.
5	Evaluation and Revision	Continuously monitoring outcomes, evaluating progress, and revising strategies as needed to adapt to changing circumstances or new opportunities.

Table 2: RIS3 implementation process

The benefits of the RIS3 can be summarised as:

- Enhanced Innovation Capacity: By concentrating resources on specific areas of strength, regions can develop deeper expertise and foster innovation more effectively.
- Increased Collaboration: The Entrepreneurial Discovery Process encourages collaboration among a diverse set of stakeholders, leading to more innovative and robust strategies.
- Better Use of Public Funds: Focused investment reduces waste and increases the impact of public funding by targeting areas with the highest potential for growth.

- Alignment with Broader EU Goals: Ensures regional development strategies contribute to EU-wide objectives, such as digital transformation, climate action, and social inclusion.

Practical cases of RIS3 are the regions of Catalonia (Spain) which is focused on industrial sectors like food, energy, and industrial systems, where the region has a strong industrial base and R&D capacity, Flanders (Belgium) which has emphasised innovation in life sciences and health, renewable energy, and sustainable logistics due to its strong academic and industrial networks in these areas, and Bavaria (Germany) which prioritised advanced manufacturing, ICT, and life sciences, leveraging its existing strengths in engineering and technology.

2.2. Impact on Regional Policy

The concept of specialisation analyses, particularly within the framework of Research and Innovation Strategies for Smart Specialisation (RIS3), has significantly influenced regional policy across Europe. By focusing on regions' unique strengths and competitive advantages, specialisation analyses provide a data-driven approach to shaping regional development strategies, ensuring that investments are both effective and sustainable. The impact of specialisation analyses on regional policy has been profound, promoting more strategic, evidence-based decision-making and fostering innovation-driven, sustainable regional development. By aligning local strengths with broader EU objectives, these analyses ensure that regional policies are not only effective locally but also contribute to the collective growth and cohesion of the EU. Table 3 presents the key impacts on regional policy.

Targeted Investment and Resource Allocation	Specialisation analyses enable regions to make informed decisions about where to allocate resources, prioritizing sectors and industries with the highest potential for innovation and economic growth. This targeted investment approach helps avoid the inefficiencies of spreading resources too thinly across too many areas, thus maximizing the impact of public funds.
Enhanced Regional Competitiveness	By identifying and fostering areas of unique competitive advantage, regions can develop specialized clusters that enhance their competitiveness at both national and global levels. This, in turn, attracts investment, talent, and partnerships, contributing to the region's economic vitality and innovation ecosystem.
Alignment with EU Cohesion Policy Goals	Specialisation analyses help regions align their development strategies with broader EU Cohesion Policy objectives, such as reducing regional disparities, promoting economic, social, and territorial cohesion, and achieving sustainable development. This alignment ensures that regional policies contribute effectively to the EU's overarching goals and benefit from EU funding opportunities.
Promotion of Innovation and Knowledge-Based Economies	By encouraging regions to focus on innovation and the development of knowledge-based economies, specialisation analyses drive the transition from traditional industries to more modern, technologically advanced sectors. This shift promotes sustainable economic growth and resilience, preparing regions to better face future challenges.
Support for Inclusive and Sustainable Growth	Specialisation analyses help regional policies to not only focus on economic outcomes but also consider social and environmental impacts. By fostering inclusive and sustainable growth, regions can address broader societal challenges such as inequality, unemployment, and environmental degradation, contributing to a more balanced and equitable development.
Strengthening of Regional Governance and Collaboration	The process of developing and implementing specialisation strategies involves extensive collaboration among regional stakeholders, including government bodies, businesses, research institutions, and civil society. This fosters a culture of collaboration and strengthens regional governance structures, making them more responsive and effective in policy implementation.

Encouragement of Entrepreneurial Discovery and Innovation	The Entrepreneurial Discovery Process (EDP), a key element of RIS3, engages a wide range of stakeholders in identifying and selecting priorities for regional development. This process not only democratizes decision-making but also stimulates entrepreneurial activity and innovation by aligning regional policy with the needs and potentials of local economies.
Continuous Learning and Adaptation	Specialisation analyses encourage regions to adopt a dynamic approach to policy development, with continuous monitoring and evaluation. This adaptability allows regions to learn from experience, adjust their strategies in response to changing circumstances, and remain competitive in a fast-evolving global economy.

Table 3: Specialisation analyses' key impacts on regional policy

2.3. I4-GREEN Regional RIS3 Strategies

With the aim of compiling and comparing the information available for RIS3 strategies on all I4-GREEN regions, a preliminary exercise was carried out to list and update the different RIS3 strategies (table 4 and table 5).

Country	Region	RIS3 strategy	Period
ES	Andalucía	Estrategia de Especialización Inteligente para la sostenibilidad de Andalucía	2021-2027
ES	Castilla y León	Estrategia de Investigación e Innovación para una Especialización Inteligente (RIS3) de Castilla y León	2021-2027
ES	Extremadura	Estrategia de Investigación e Innovación para la Especialización Inteligente de Extremadura	2021-2027
PT	Alentejo	Desafiar o Futuro	2021-2030

Table 4: RIS3 strategies of the I4-GREEN regions

The following table 5 summarises whether these strategies have included mining as a priority.

Country	Region	RIS3 Mining priority	National policy in mining
ES	Andalucía	Y	Mining Law 22/1973, of 21 July, (and its regulations approved by Royal Decree 2857/1978, of 25 August
ES	Castilla y León	Y	
ES	Extremadura	N	
PT	Alentejo	Y	Law 54/2015, of 22 June, regulated by the decree of law 30/2021 of 7 May

Table 5: RIS3 mining priorities in the I4-GREEN regions

Most of the RIS3 strategies cover the same period (2021- 2027). This supports the alignment of policies and strategies to take appropriate measures towards the inclusion, recognition or enhancement of the position of mining & metallurgy activities as key objective or as one of their thematic priority lines.

3. The European Innovation Partnership (EIP)

The European Innovation Partnerships (EIPs) are key instruments within the European Union's research and innovation funding framework. They were introduced under the Europe 2020 strategy to foster collaboration between the public and private sectors and address major societal challenges by speeding up the development and deployment of innovative solutions. The existing EIPs are on Active and Healthy Ageing (EIP-AHA), Agricultural Productivity and Sustainability (EIP-AGRI), Raw Materials, Water, and Smart Cities and Communities (EIP-SCC). EIPs are part of the broader EU innovation ecosystem, working alongside other EU funding programs such as Horizon Europe, the ESI Funds and sector-specific funds.

The EIPs and the RIS3 share a common goal of promoting innovation-driven growth across the EU. They are closely related as both frameworks aim to enhance collaboration among various stakeholders, such as businesses, research institutions, and governments, to drive innovation in key sectors and regions.

3.1. Role of the European Innovation Partnership on Raw Materials

The EIP on Raw Materials is a public-private platform (of which the I4-GREEN coordinator ICAMCYL is a partner) that promotes collaboration between industry, academia, and governments to ensure the sustainable supply of raw materials. It encourages research, innovation, and investment in the raw materials sector, with the following objectives:

- Reducing Europe's dependency on imports of critical raw materials.
- Promoting sustainable mining, processing, and recycling within the EU.
- Developing alternatives and substitutes for critical raw materials in industries such as renewable energy and electronics.

The SIP provides a roadmap for achieving these objectives, guiding investments and research efforts while encouraging cooperation across sectors and countries.

3.2. Strategic Implementation Plan for Raw Materials

Raw materials, including critical minerals and rare earth elements, are essential to various industries, including renewable energy, high-tech manufacturing, and digital technologies. The Strategic Implementation Plan (SIP) of the EIP on Raw Materials outlines a holistic approach to managing raw materials, encompassing responsible extraction, innovative recycling, and the development of substitutes, with the aim of ensuring Europe's competitiveness and sustainability.

The SIP is a critical framework designed to secure a sustainable and resilient supply of raw materials for the EU. It was established to address Europe's dependency on imported raw materials, focusing on innovation and sustainability throughout the raw materials value chain—exploration, extraction, processing, recycling, and substitution—aiming to reduce dependency on imports, increase resource efficiency, and drive technological progress in raw material management.

The SIP supports Europe's broader goals, including the European Green Deal and the Circular Economy Action Plan, by promoting resource efficiency and sustainability in key sectors like renewable energy, batteries, and advanced manufacturing. It is structured around three core pillars, each focusing on a different part of the raw materials value chain (table 6).

Pillar 1	Pillar 2	Pillar 3
Ensuring Sustainable Supply from EU Sources	Resource Efficiency and Circular Economy	Raw Material Substitution and Innovation
Emphasizes the need to boost domestic production of raw materials through sustainable	Promotes resource efficiency and circular economy practices by advancing technologies for	Addresses the need for innovation in developing substitutes for critical raw materials, particularly

mining and extraction. It focuses on improving access to resources, streamlining regulatory frameworks, and investing in modern, environmentally responsible mining technologies.	recycling and re-use of raw materials. This includes recovering valuable materials from end-of-life products and industrial waste, with the goal of reducing waste generation and minimizing the need for new raw material extraction.	in industries like renewable energy, battery production, and digital technologies. By encouraging research into alternative materials, the EU aims to reduce its reliance on scarce or geopolitically sensitive raw materials.

Table 6: Pillars of the SIP

3.3. Relation between the RIS3 and the EIP

The EIPs and RIS3/Smart Specialisation strategies are complementary frameworks that work together to promote innovation-led growth across Europe. EIPs provide platforms for cross-border and multi-stakeholder collaboration on innovation, while RIS3 strategies focus on harnessing regional strengths to drive development. Regions benefit from aligning their RIS3 priorities with EIP activities, gaining access to a broader range of EU funding opportunities and strengthening their innovation ecosystems.

4. EU Funding Instruments for Raw Materials

After the Europe 2020 strategy concluded, the European Union introduced new priorities under the leadership of the von der Leyen Commission for the 2019-2024 period. The core focus has shifted towards six main priorities, with a strong emphasis on addressing climate change, digital transformation, and socio-economic recovery. The key initiatives include:

1. European Green Deal: Aiming for climate neutrality by 2050, this is the EU's flagship strategy to combat climate change by transforming industries, fostering clean energy, and creating green jobs.
2. Digital Transformation: The EU seeks to become a global leader in the digital space, promoting digital sovereignty and innovation to drive economic growth and protect citizens' rights in the digital age.
3. A Stronger Europe in the World: Strengthening the EU's role on the global stage by promoting multilateralism, enhancing trade relations, and supporting global partnerships while maintaining high standards for labor and environmental protections.
4. Economy that Works for People: This priority focuses on ensuring that economic growth is inclusive and sustainable, aiming for quality jobs, particularly through the circular economy and industrial transformations.
5. Promoting Democracy and Protecting European Values: The EU is working to strengthen its democratic institutions and protect against threats such as disinformation, cyberattacks, and election interference.
6. A New Push for European Democracy: The EU also focuses on improving governance and ensuring citizens have a stronger voice in EU decision-making processes.

These strategies are being implemented through the current EU long-term budget (2021-2027 Multiannual Financial Framework) and key initiatives such as the NextGenerationEU recovery plan, designed to boost recovery from the COVID-19 pandemic while accelerating digital and green transitions.

The transition towards circular and sustainable economic models in Europe requires substantial investment and targeted financial support. The European Union and its member states have developed a broad array of financial instruments to support research, innovation, and sustainable development (figure 1). These instruments are designed to leverage public funds to attract private investment and

stimulate economic growth while ensuring social and environmental sustainability. They can be broadly categorized into grants, loans, guarantees, equity investments, and blended finance mechanisms, each tailored to different stages of the innovation and development process.

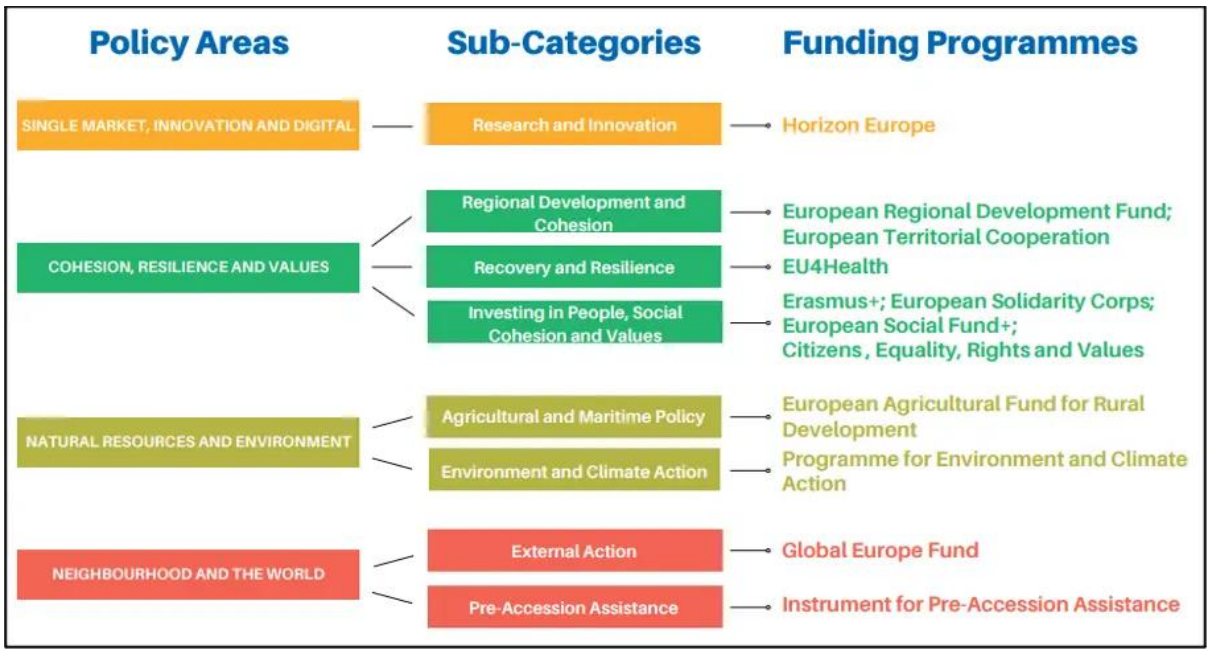

Figure 1 – European funding instruments. Source EUOffice

The diversity of funds has driven the necessity of tools or initiatives that facilitate the access to potential beneficiaries. For example, the EU has recently established the Strategic Technologies for Europe Platform (STEP) to assist the European industry and enhance investment in vital technologies within Europe. STEP allocates and guides funding from 11 EU programs toward three specific investment areas:

- Digital technologies and advanced technical innovation
- Clean and efficient technologies for resources
- Biotechnologies

STEP also backs initiatives aimed at developing the necessary skills for advancing these crucial technologies. Additionally, it has introduced a new STEP Seal, an EU designation for high-quality projects, which provides visibility for projects and facilitates their access to other potential funding sources.

For this deliverable, a collection of information from EU funding and investment instruments applying to the raw materials sector has been carried out. This information was gathered between September and October 2024.

4.1. European Structural and Investment (ESI) Funds

In 2014-2020, the ESI Funds unleashed a total investment of €731 billion, of which €535 billion was funded by the EU, fostering lasting socio-economic convergence, territorial cohesion, social Europe and a smooth green and digital transition.

As one of the largest investment instruments under the EU budget, the ESI Funds support the territorial, economic and social cohesion of Europe's regions, as well as their resilience and recovery from the crisis faced in the past years.

They comprise of (figure 2):

- the European Regional Development Fund;
- the European Social Fund Plus; its total budget for the 2021-2027 period is €99.3 billion, making it the largest fund dedicated to social investment within the EU.
- the Cohesion Fund;
- the European Agricultural Fund for Rural Development
- the European Maritime and Fisheries Fund.

The policy objectives pursued with the ESI Funds include research and innovation, digital technologies, supporting the low-carbon economy, sustainable management of natural resources, small businesses, smart, sustainable and inclusive growth, employment, better education and training, strengthening the institutional capacity of public administration, urban development and territorial cooperation (Interreg).

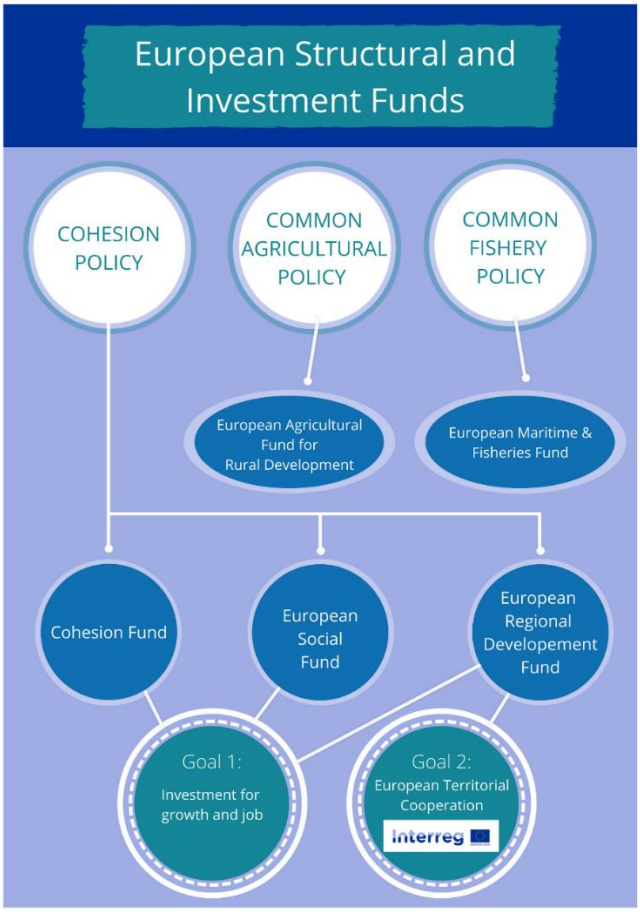

Figure 2 – ESI Funds instruments. Source EU Commission

From the ESI Funds, the three considered of interest for raw materials due to their goals and priorities are the ERDF, the ESF and the Cohesion Fund.

4.1.1. European Regional Development Fund - ERDF

The ERDF is aimed at enhancing economic, social, and territorial cohesion across the European Union. Its purpose is to address regional disparities by supporting investments that contribute to a smarter, greener, more connected, and socially inclusive Europe.

The ERDF finances programs through a system of shared responsibility between the European Commission and national and regional authorities of the Member States.

During the 2021-2027 period, the ERDF will prioritise and enable investments that focus on making Europe and its regions:

- more competitive and smarter, through innovation and support to small and medium-sized businesses, as well as digitisation and digital connectivity.
- greener, low-carbon and resilient.
- more connected by enhancing mobility.
- more social, by supporting employment, education, skills, social inclusion and equal access to healthcare, as well as by enhancing the role of culture and sustainable tourism.
- closer to citizens, supporting locally led development and sustainable urban development across the EU.

In line with their level of prosperity, all regions and Member States (MSs) will focus their investments on a more competitive and smarter Europe (Policy Objective – PO 1), as well as greener, low-carbon transitioning towards a net zero carbon economy and resilient Europe (PO2), through the mechanism known as 'thematic concentration'. At least 30% of each region's or Member State's allocation must support PO2 (green and resilient objectives). Additionally:

- More developed regions/MSs must dedicate at least 85% of their total funding to PO1 and PO2.
- Transition regions/MSs are required to allocate at least 40% to PO1.
- Less developed regions/MSs must allocate at least 25% to PO1.

Additionally, all regions and Member States must invest at least 8% of their funding in urban development, delivered through local development partnerships using a variety of tools. Operations under the ERDF are also expected to contribute 30 % of the overall finance to climate objectives[1].

Interregional Innovation Investments (I3) Instrument

The Interregional Innovation Investments (I3) Instrument is a funding initiative under ERDF with €570 million for the 2021-2027 period. Its target areas are green technologies, digital transformation, health innovation, and advanced manufacturing. The Open Calls and the funded projects and investments carried out through this instrument can be checked through the I3 Instrument website (check previous link).

This Instrument aims to support interregional partnerships in commercializing and scaling up innovative projects by fostering cooperation across regions within the EU. Its key objectives are:

- Interregional Cooperation: The I3 Instrument encourages regions to collaborate on innovation projects, particularly in smart specialization strategies (S3), where regions focus on their unique strengths and innovation potentials.
- Innovation Commercialization: The goal is to help regions move from research and innovation to the commercialization of new technologies, with an emphasis on scaling up innovative solutions that can be adopted across multiple regions.

It is divided into two strands:

- Strand 1: Supports innovation investments to develop European value chains across various sectors, encouraging the uptake of advanced technologies.
- Strand 2: Focuses on helping less-developed regions to connect with more advanced regions, enhancing capacity building and the integration into innovation ecosystems to improve their competitiveness.

The instrument is available to public authorities, businesses, research institutions, and clusters in EU regions that wish to collaborate on innovation projects. It is particularly designed for regions that have

[1] https://ec.europa.eu/regional_policy/funding/erdf_en

adopted smart specialization strategies and want to scale up innovations by collaborating with other regions across borders.

The I4-GREEN project hast been funded through this instrument.

Interreg

Interreg is a key component of the European Union's Cohesion Policy, designed to foster cooperation between regions and countries to address common challenges. For the 2021-2027 funding period, Interreg has an overall budget of around €8 billion, which comes primarily from the European Regional Development Fund (ERDF). The calls for projects can be checked through the Interreg Calls for projects website. The Interreg priorities are[2]:

- Innovation and Competitiveness: Strengthening research, technological development, and innovation in border and transnational regions.
- Environmental Protection and Climate Action: Promoting sustainable development, renewable energy, and joint environmental protection efforts, aligned with the goals of the European Green Deal.
- Mobility and Accessibility: Enhancing transport links, digital infrastructure, and cross-border mobility to improve connections between border regions.
- Social Inclusion: Supporting integration and cooperation in areas such as healthcare, education, and labor markets, particularly for vulnerable groups in border regions.
- Governance and Institutional Capacity: Encouraging closer cooperation between public administrations and institutions in different regions, improving governance in cross-border contexts.

Interreg is divided into different strands or components that cover various aspects of regional cooperation:

- Interreg A – Cross-Border Cooperation: Supports cooperation between regions located along shared borders of EU Member States. It aims to address common challenges in border regions.
- Interreg B – Transnational Cooperation: Focuses on larger geographic areas (transnational regions) that share common challenges or opportunities.
- Interreg C – Interregional Cooperation: Encourages regions from across Europe to share best practices and experiences to improve regional development strategies. The goal is to enhance the effectiveness of regional policies by fostering knowledge exchange and capacity building.
- Interreg D – Outermost Regions and Neighboring Countries: This strand supports cooperation between the EU's outermost regions and neighbouring countries outside the EU, often in collaboration with countries benefiting from other EU external action instruments.

4.1.2. European Social Fund

The European Social Fund (ESF) is one of the European Union's main financial instruments designed to promote social inclusion, employment, and skills development across its Member States, who are responsible for their implementation. It is aligned with EU policies aimed at reducing disparities across regions and promoting sustainable, inclusive growth. In the 2021-2027 period, the ESF was expanded into the European Social Fund Plus (ESF+). The thematic Priorities for 2021-2027 are:

- Youth Employment: Continued support for the Youth Guarantee, which ensures that young people under 30 receive a quality offer of employment, continued education, apprenticeship, or training within four months of leaving education or becoming unemployed.
- Child Guarantee: The ESF introduces a focus on reducing child poverty through the European Child Guarantee, which ensures that children in need have access to key services like healthcare, education, and healthy nutrition.

[2] https://interreg.eu/about-interreg/

- Skills and Training: Special attention is given to training programs aligned with green and digital transitions, equipping workers with future-oriented skills.
- Social Inclusion: A minimum of 25% of ESF funds must be allocated to social inclusion measures, including tackling poverty and inequality.

4.1.3. Cohesion Fund – CF

The Cohesion Fund is designed to reduce economic and social disparities between EU regions and promote sustainable development. Their objective is to support investments in infrastructure, renewable energy, energy efficiency, waste management, and sustainable urban development. Its greater impact is the enhancement of regional capacity to transition to sustainable models, fostering economic convergence and social cohesion across the EU. 37% of the overall financial allocation of the Cohesion Fund are expected to contribute to climate objectives.

Cohesion funds provide support to Member States with a gross national income (GNI) per capita below 90% EU-27 average to strengthen the economic, social and territorial cohesion of the EU. For the 2021-2027 period, the Cohesion Fund concerns Bulgaria, Czechia, Estonia, Greece, Croatia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Portugal, Romania, Slovakia and Slovenia.

The Cohesion Fund finances programmes in shared responsibility between the European Commission and national and regional authorities in Member States. The Member States' administrations choose which projects to finance and take responsibility for day-to-day management.

4.2. Horizon Europe

Horizon Europe (HE) is the EU's flagship research and innovation programme for 2021-2027[3]. With a budget of €95.5 billion[4], it aims to foster scientific excellence, boost Europe's innovation capacity, and address global challenges. HE supports projects that contribute to achieving the European Green Deal, digital transition, and inclusive growth (focus areas include climate action, sustainable energy, and circular economy initiatives), and facilitates collaboration across borders and sectors, driving research and innovation in sustainability and helping bring new technologies and solutions to market.

With a strong focus on supporting scientific excellence, fostering innovation, and addressing global challenges such as climate change, digitalization, and health, HE finances cutting-edge research, technological development, and innovation across a variety of fields, including green technologies, digital transformation, health, and space exploration (figure 3).

HE is very complementary with the ESI Funds (like the ERDF), since these focus more on regional development and capacity building. HE and the Smart Specialization Strategies (S3) funded by the ERDF encourage innovation ecosystems at the regional level. This fosters collaboration between academia, industry, and pubic authorities in driving innovation and competitiveness across the EU.

[3] https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en

[4] https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/how-horizon-europe-was-developed_en

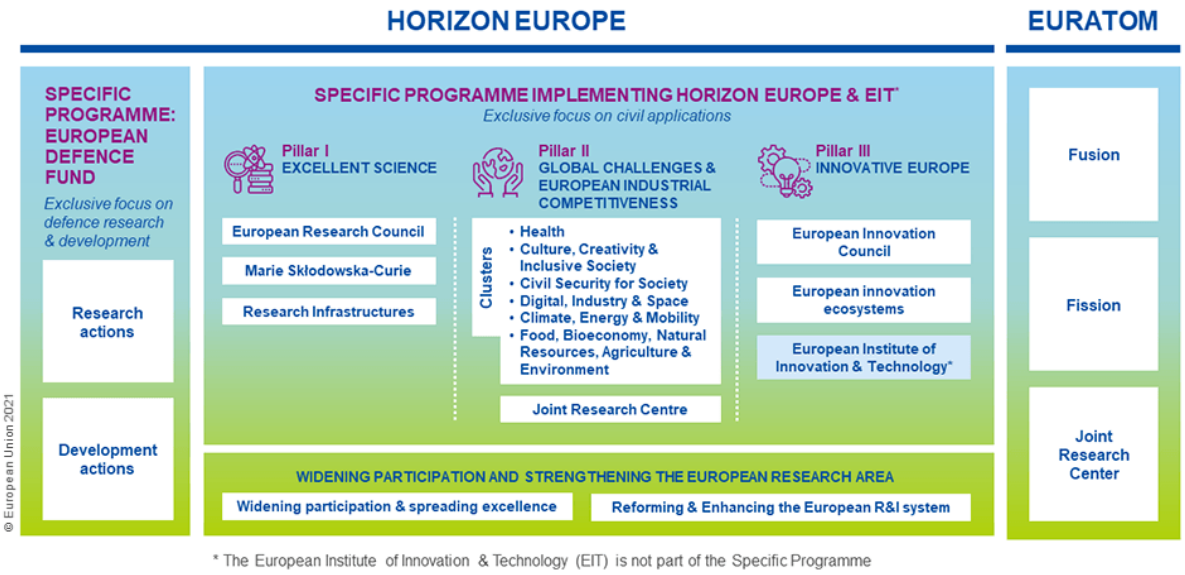

Figure 3 – Structure of Horizon Europe and EURATOM (Source: European Commission. Horizon Europe)

4.2.1. EIT Funding

The European Institute of Innovation and Technology (EIT) offers various types of funding to support innovation, entrepreneurship, and education aimed at fostering collaboration between businesses, academia, and research institutes, through what it calls Knowledge and Innovation Communities (KICs). EIT funding is typically offered in a co-funding model, where the KICs or other participants (start-ups, SMEs, universities) must contribute a portion of the total project costs, ensuring shared responsibility and commitment.

Here's an overview of the funding opportunities provided by the EIT. Which can be checked through the EIT Opportunities website:

1. EIT Funding through Knowledge and Innovation Communities (KICs):

The EIT primarily channels funding through its KICs, which are partnerships that focus on addressing societal challenges in areas such as climate, digital innovation, energy, food, health, raw materials, and urban mobility. These KICs offer several types of funding opportunities:

- Innovation Projects: Grants for innovative projects that promote the development of new products, services, and processes.
- Entrepreneurship Support: Grants and equity investment for entrepreneurs and start-ups to develop and scale innovative solutions. This is provided through the KICs and often involves business creation programs, mentoring, and networking opportunities. This includes access to financing, mentoring, and acceleration services for start-ups, scale-ups, and SMEs.
- Education Programs: Funding for master's and PhD programs, as well as entrepreneurial education (often in collaboration with universities), that aim to foster entrepreneurial and innovation skills, often in partnership with universities and research institutes.
- Innovation projects that bring together stakeholders from various sectors (academia, industry, and government) to solve challenges in key sectors like energy, digitalization, healthcare, and sustainable cities.
- Business Creation Services: Support for launching new ventures and scaling existing ones through incubation, acceleration programs, and venture funding through EIT KICs' investment arms, which co-invest in promising start-ups, especially those aligned with the goals of addressing societal challenges.

2. EIT Regional Innovation Scheme (EIT RIS):

The EIT RIS provides funding to help boost innovation in regions that are considered modest and moderate innovators. It aims to bridge the innovation gap between these regions and more advanced ones by offering targeted support to organizations and start-ups from these areas.

4.2.2. EIC Accelerator

The EIC Accelerator is a funding program under the European Innovation Council (EIC), which is part of the Horizon Europe framework. It is designed to support high-risk, high-potential start-ups and SMEs from any sector or country within the European Union and associated countries in developing and scaling up breakthrough innovations. While the EIC Accelerator is open to innovations in any field, it particularly focuses on projects that support the EU's priorities such as green technologies, digital transformation, healthcare innovations, and sustainable growth. The focus is on projects that have the potential to create new markets or disrupt existing ones, particularly in sectors aligned with EU priorities such as sustainability, digital technologies, and health. The conditions to apply and next opportunities can be checked through the EIC Accelerator website.

The EIC Accelerator funds through:

- Grants: Up to €2.5 million for early-stage innovation (Technology Readiness Levels 5-8), typically covering up to 70% of project costs.
- Equity Investment: Up to €15 million for scaling and commercialization activities for market deployment (TRL 9) (patient capital» principle with a 7-10 years perspective).
- Blended Finance: The program offers a unique combination of grants and equity funding (known as blended finance). This approach allows start-ups to access non-dilutive capital (grants) to further develop their technology and equity investments to support scaling and commercialization.

In addition to financial support, the EIC Accelerator provides coaching, mentoring, and access to a network of investors and corporate partners. These services are aimed at helping companies grow faster and access additional funding sources.

4.2.3. EIC Pathfinder

The EIC Pathfinder is another funding program under the European Innovation Council (EIC). The EIC Pathfinder Open (formerly known as FET-Open) funds projects in any field of science, technology or application without predefined thematic priorities. It supports the development of cutting-edge early-stage technologies. This competitive funding scheme aims to bring radical and ambitious ideas for new technologies to life and is open to applicants from any discipline.

Grants of up to 4 million euros are available to support the early-stage development of future technologies, such as various activities at low TRL 1-3, up to proof of concept. Pathfinder Open offers grants of up to EUR 3 million or more if duly justified. Additionally, Pathfinder projects can receive extra funding for testing the innovation potential of their research outputs. Similar to the EIC Accelerator, Pathfinder provides coaching, mentoring, and access to a network of investors and corporate partners.

4.3. LIFE

The LIFE Program (*L'Instrument Financier pour l'Environnement*) is the EU's dedicated funding instrument for the environment and climate action. It has a total financial envelope of €5.43 billion (in current prices) for the period 2021-2027, focused on protecting biodiversity, improving environmental governance, and supporting the transition toward a low-carbon, resource-efficient, and climate-resilient economy[5]. The LIFE programme 2021-2027 is divided into the following four sub-programmes:

- Nature and biodiversity

[5] https://cinea.ec.europa.eu/programmes/life_en

- Circular economy and quality of life
- Climate change mitigation and adaptation
- Clean energy transition

Of the total budget, with €1.94 billion allocated specifically for climate action. Of this, €947 million is dedicated to the sub-programme for Climate Change Mitigation and Adaptation, and €997 million for the Clean Energy Transition sub-programme, both of which are relevant for hydrogen-related projects. The types of hydrogen projects that can apply for LIFE Programme grants are:

- Standard Action Projects: projects, other than strategic integrated projects, strategic nature projects or technical assistance projects, that pursue the specific objectives of the LIFE programme.
- Strategic Integrated Projects (SIP): projects that implement, on a regional, multi-regional, national or transnational scale, climate strategies or action plans developed by EU country authorities, while ensuring that stakeholders are involved and promoting coordination with and mobilisation of at least one other Union, national or private funding source.
- Technical Assistance Projects: projects that support the development of capacity for participation in other types of LIFE programme projects, as well as for the preparation for accessing other Union financial instruments or other measures necessary for preparing the upscaling or replication of results from other projects funded by the LIFE programme or its predecessor. These projects can also include capacity-building related to the activities of EU country authorities for effective participation in the LIFE programme.
- Other Action Grants: actions needed for the purpose of achieving the general objective of the LIFE programme, including coordination and support actions aimed at capacity-building, at dissemination of information and of knowledge, and at awareness-raising to support the transition to renewable energy and increased energy efficiency.
- Operating Grants: grants that support the functioning of non-profit making entities which are involved in the development, implementation and enforcement of Union legislation and policy, and which are primarily active in the area of the environment or climate action, including energy transition, in line with the objectives of the LIFE programme. LIFE supports projects related to environmental conservation, nature protection, biodiversity, waste management, energy efficiency, and climate adaptation and mitigation. Thus, this programme enhances the development of green technologies and practices, promoting sustainable business models and environmental stewardship, aligning with objectives such as those of the European Green Deal.

While the ESI Funds (particularly the Cohesion Fund and ERDF) focus more broadly on economic development and reducing disparities across regions, LIFE is targeted at environmental and climate-specific goals. Many LIFE projects complement ESI Fund-supported initiatives, especially those related to sustainable regional development, green infrastructure, and energy efficiency. But unlike the ESI Funds, which are implemented under shared management between the European Commission and Member States, LIFE is managed directly by the European Commission.

4.4. ETS Innovation Fund

The Innovation Fund is part of the EU's Emissions Trading System (ETS). It has a total budget of around €38 billion for the period 2021-2030[6], focused on:

- Renewable energy
- Energy storage
- Carbon capture, use, and storage (CCUS)
- Energy-intensive industries.

[6] https://cinea.ec.europa.eu/about-innovation-fund_en#:~:text=The%20Innovation%20Fund%20will%20provide,support%20its%20transition%20to%20climate

This fund is one of the world's largest funding programs designed to support the commercial demonstration of innovative low carbon technologies, and supports the commercialization of innovative projects aimed at reducing greenhouse gas emissions. The fund provides significant financial support to projects in energy-intensive industries, renewable energy, energy storage, and carbon capture and storage. The Innovation Fund provides up to 60% of project costs and is designed to support both large-scale projects (with capital expenditures over €7.5 million) and small-scale projects (under €7.5 million). Regular calls for proposals are held, allowing businesses to apply for funding based on project maturity, innovation, and potential to reduce emissions. The size of the fund depends on the price of carbon, as it is primarily financed by the revenues from auctioning EU ETS allowances.

The Innovation Fund targets large-scale innovative projects that can help reduce greenhouse gas emissions, particularly in sectors covered by the EU ETS.

Projects funded by the Innovation Fund often complement efforts supported by the ESI Funds, particularly in the context of energy transition and decarbonization in less-developed regions. The ESI Funds, particularly under the thematic concentration for a greener, low-carbon Europe (PO2), focus on supporting the transition to a carbon-neutral economy, which aligns with the goals of the Innovation Fund.

The Innovation Fund often complements large-scale infrastructure projects that are part of broader regional and national plans financed by the Cohesion Fund and Just Transition Fund. It helps de-risk major industrial innovations that contribute to the EU's climate targets, while the ESI Funds provide structural investments to ensure that regions and industries can transition effectively to a low-carbon economy.

4.5. ETS Modernization Fund

The Modernization Fund, also financed through the EU ETS, is dedicated to supporting 13 lower-income EU Member States in their energy transitions. Its focus is on modernizing energy systems, improving energy efficiency, and investing in renewable energy and the energy grid.

The Modernization Fund shares a similar objective with the CF and the ERDF under the ESI umbrella, which support infrastructure development and capacity building in less developed regions. The Modernization Fund focuses on energy-specific modernization projects, complementing the broader scope of ESI Funds.

Like the Innovation Fund, the Modernization Fund may help implement and deploy technologies developed through Horizon Europe, particularly in less-developed EU regions where infrastructure investment is needed. EFSI can complement the Modernization Fund by attracting private investment to infrastructure and modernization projects that might otherwise be too risky for private investors. The Modernization Fund provides public support to de-risk these projects, while EFSI helps to bring in additional private capital.

4.6. Invest EU

The InvestEU program is a key initiative under the EU's 2021-2027 Multiannual Financial Framework, designed to support investments that contribute to EU policy priorities such as sustainable development, innovation, and economic recovery. It builds on the success of the EFSI 2015-2020, and integrates several EU financial instruments into a more streamlined structure to drive investment in strategic areas:

- Sustainable Infrastructure: Supports investments in clean energy, digital connectivity, transport, and circular economy initiatives.
- Research, Innovation, and Digitization: Focuses on fostering cutting-edge research, supporting start-ups, and encouraging digital innovation across Europe.
- SMEs: Provides access to finance for small and medium-sized enterprises (SMEs), ensuring they can grow and innovate.

- Social Investment and Skills: Supports projects that promote employment, social inclusion, skills development, and access to healthcare and education.

InvestEU is backed by an EU budget guarantee of €26.2 billion. The program aims to mobilize over €372 billion in private and public investment by providing EU guarantees to de-risk projects and attract additional financing from private investors. By leveraging the EU guarantee, InvestEU encourages financial intermediaries, like commercial banks and private investors, to invest in sectors where traditional financing might be too risky.

InvestEU offers guarantees, loans, and equity financing through financial partners, primarily the European Investment Bank (EIB) and the European Investment Fund (EIF). Other national and international financial institutions, like national promotional banks, can also access the program to channel financing into local projects.

4.6.1. Synergies with Other EU Programs

InvestEU complements the Horizon Europe program by providing financial instruments to scale up innovations developed through Horizon Europe research projects. Horizon Europe focuses on funding early-stage research, while InvestEU helps bring these innovations to market by providing guarantees and loans.

InvestEU also works alongside the European Structural and Investment Funds (ESI Funds), which provide grants for regional development. ESI Funds often support public sector investments in infrastructure and capacity building, while InvestEU focuses on mobilizing private sector investments in the same sectors.

In summary, InvestEU acts as a catalyst for private investment across strategic sectors, ensuring that key projects in sustainability, digitalization, and social investment have access to the necessary financing to grow and contribute to the EU's overall goals.

5. EUREKA

EUREKA is not located within the core EU funding programs but operates parallel to them as an intergovernmental network that promotes international cooperation in research, development, and innovation. It was founded in 1985 and involves over 45 countries, including EU member states and non-EU countries like Canada, South Korea, and South Africa. EUREKA's primary focus is on market-oriented R&D projects involving companies, research organizations, and universities. EUREKA, while independent, complements EU research and innovation funding by providing additional opportunities for collaboration and commercialization of new technologies, working closely with EU funding programs such as Horizon Europe.

Key Characteristics of EUREKA:

- Intergovernmental: EUREKA is governed by member countries, not the EU, though EU institutions participate.
- Innovation and Market Focus: EUREKA supports projects aimed at developing innovative products, services, and technologies with clear market potential.
- Bottom-Up Approach: Unlike many EU funding instruments, which may have predefined priorities or topics, EUREKA has a bottom-up structure, meaning applicants define their project topics based on their own needs and innovation goals.
- Global Reach: EUREKA is not confined to Europe; it has global participation, enhancing international collaboration beyond EU borders.

5.1. Eurostars

EUROSTARS is part of the EUREKA network and is co-funded by the European Union's Horizon Europe programme. It specifically falls under the umbrella of support for SMEs (small and medium-sized enterprises).

It is designed to support innovative R&D-performing SMEs and their partners, such as research organizations and larger companies, in developing market-ready products, services, or processes. It operates as a joint program between national and regional agencies and the EU, targeting transnational collaboration in research and innovation. The program helps SMEs access funding to bring their innovative ideas to market more quickly, contributing to the broader goals of Horizon Europe.

5.2. EUREKA Clusters

EUREKA Clusters are large, thematic public-private partnerships that bring together companies, research organizations, and universities to collaborate on long-term, industry-driven R&D projects. These clusters are focused on specific technological domains or industries, and they aim to develop innovations that have significant market potential. They are often aligned with strategic sectors that are important for economic and technological development, being EUROGIA, SMART and ITEA the ones with most potential for projects about raw materials sustainability.

EUREKA Clusters play a crucial role in helping European industries stay competitive in global markets by advancing cutting-edge technologies through collaborative innovation. There five clusters are:

- EUROGIA: Specializes in low-carbon energy technologies. It supports R&D in renewable energy sources like solar, wind, geothermal, and energy efficiency solutions aimed at reducing carbon footprints and mitigating climate change.
- SMART: Aims at advancing manufacturing and production technologies, driving innovation in Industry 4.0, robotics, automation, and sustainable manufacturing processes.
- ITEA: Focuses on software innovation and digital transition, enabling large international collaborations to develop software-intensive systems and services across a range of sectors like healthcare, automotive, and manufacturing.
- Xecs: Focuses on electronic components and systems, promoting sustainable digital transformation. It supports innovations in microelectronics and digital technologies that enable smart and sustainable solutions in various industries.
- CELTIC-NEXT: Focuses on next-generation communication technologies, including 5G and 6G. It aims to create a secure, trusted, and sustainable digital society by driving innovations in areas like AI, big data, smart cities, and digital health.

5.3. Network Projects

EUREKA Network Projects are the core instrument of the EUREKA network, supporting international R&D collaboration between businesses, research organizations, and universities. These projects are bottom-up (there are no predefined themes, allowing participants to freely define the scope and focus of their R&D activities based on their needs and innovation goals) and should be market-oriented (develop innovations with strong market-driven focus, to ensure that the outcomes have a clear path toward commercialization.). Its key Characteristics are:

- International Collaboration: Projects involve participants from at least two EUREKA member countries, fostering global partnerships to drive innovation.
- Flexibility: EUREKA Network Projects are not restricted to specific sectors or technologies. Any organization with an innovative R&D idea can submit a project proposal, as long as it has a strong market-oriented focus and involves transnational collaboration.
- Access to National Funding: Each participating country funds its own entities involved in the project. Although there is no central EUREKA funding, each country's funding body supports its national participants based on local rules and priorities.

- Broad Range of Participants: Network Projects include SMEs, large companies, research institutions, and universities, all collaborating to develop marketable products, services, or technologies.

5.4. Global Stars

EUREKA GlobalStars is aimed at fostering international R&D collaboration between EUREKA member countries and non-EUREKA countries. It provides opportunities for companies and research organizations from EUREKA countries to collaborate with partners in specific global markets, such as Canada, India, Japan, Singapore, South Korea, and more.

Similar to EUREKA Network Projects, GlobalStars focuses on international cooperation but extends this collaboration to countries outside the EUREKA network. Projects typically involve businesses, research institutions, and academic partners from multiple countries. Each participating country funds its own national entities, according to their local funding mechanisms. There is no central EUREKA fund; however, governments from both EUREKA and non-EUREKA countries work together to support these projects. Projects can be either bilateral (one EUREKA country working with a non-EUREKA country) or multilateral (multiple EUREKA and non-EUREKA countries). This flexibility allows for diverse consortia to work together on innovative solutions.

Like other EUREKA programs, GlobalStars operates under a bottom-up approach, allowing participants to propose projects across various technology fields, provided there is a clear market orientation and commercial potential.

6. National and Regional Funding in the I4-GREEN Regions

This section provides tables with specific instruments for funding at a national and regional level in Spain and Portugal.

Scope	Organism	Funding
International (co-funding) & National	CDTI	The CDTI is one of Spain's primary public bodies supporting technological innovation and development. It offers several financial instruments: Direct Grants: For R&D projects, innovation, and technology transfer. Partially Reimbursable Loans: Long-term loans with favorable conditions for projects in sectors like biotechnology, manufacturing, and ICT. NEOTEC Program: Grants and loans for start-ups focused on innovative technology projects. Global Innovation Line (Línea Global de Innovación): Financing for international R&D and innovation projects.
National	Instituto de Crédito Oficial - ICO	The ICO is a state-owned bank that plays a crucial role in providing financial support, especially to SMEs. Some of its key instruments include: ICO Business Loans: For investments and liquidity, available through a network of commercial banks. ICO International: Loans to support the internationalization of Spanish companies. ICO Innovation: Financing for companies investing in R&D and innovation.
National	Empresa Nacional de Innovación - EINSA	ENISA provides financing to support SMEs and start-ups, focusing on innovation and entrepreneurship. Its financial products include: Participative Loans: Hybrid loans with flexible interest rates based on the success of the business. These loans are designed for entrepreneurs, start-ups, and SMEs at various stages of growth. Young Entrepreneurs Program: Specific loans for young business founders to support innovative business models.
National	Sociedades de Garantía Recíproca	SGRs offer credit guarantees for SMEs to facilitate their access to credit. These organizations help reduce the financial risk for commercial banks and other lenders, making it easier for SMEs to secure loans.
National	CERSA	CERSA supports guarantee societies by offering re-guarantees on credit, improving the financing conditions for SMEs. CERSA plays a vital role in strengthening the SGR system and expanding SME access to loans and credit lines.
National	ICEX	ICEX provides support for international trade and foreign investments. It offers various financial instruments such as: Subsidies and financial aids for companies looking to expand internationally. Training grants for employees in export-oriented sectors. Loans and guarantees to facilitate foreign direct investments (FDIs) and promote Spanish exports.
National	SEPI	SEPI is a state-owned industrial holding company that invests in strategic industries. It offers: Direct investments and capital injections in key sectors such as energy, telecommunications, and defence. Financial rescue packages for companies in distress.
National	CEOC Programs for Business Competitiveness	The Spanish Confederation of Business Organizations (CEOE) offers support programs aimed at improving the competitiveness and internationalization of Spanish businesses. These programs often involve partnerships with public and private banks to offer credit lines and funding for R&D and innovation initiatives.
National	FOND-ICO	This is a venture capital fund managed by ICO through its asset management arm AXIS, which invests in start-ups, SMEs, and scale-ups in Spain. It provides financing through: Direct investments in venture capital and private equity funds. Co-investment in innovative companies across various sectors, particularly those involved in technological development and sustainability
Regional	Junta de Andalucía	Including industrial research, experimental development and innovation for SMEs
Regional	Junta de Castilla y León	For investment, R&D and internationalisation of SMEs
Regional	Junta de Extremadura	For investment and industrial development of SMEs and startups focused on agrifood, ecological transition, health and wellbeing and digital transformation.

Table 7: Spanish National and Regional Funding in the I4-GREEN Regions

Scope	Organism	Funding
International	AICEP - Portuguese Trade & Investment Agency	AICEP - Portuguese Trade & Investment Agency is the public body that promotes the attraction of productive inward investment and the internationalization of the Portuguese economy, fostering export growth and the international expansion of Portuguese companies. AICEP has offices in Portugal and an external network in around 50 countries.
National	ANI - National Innovation Agency	The National Innovation Agency (ANI) plays a vital role in building a robust innovation ecosystem. Responsible organisation for bringing scientific and technological knowledge closer to the economy and companies, promoting the transfer of knowledge and creating value for the Portuguese economy.
National	IAPMEI, I.P. - Agency for Competitiveness and Innovation	Promote competitiveness and business growth, ensure support for the design, implementation and evaluation of policies aimed at industrial activity, with a view to strengthening innovation, entrepreneurship and business investment in companies operating in the areas under the Ministry of Economy's supervision, particularly small and medium-sized companies.
National	FCT - Fundação para a Ciência e a Tecnologia	The Foundation for Science and Technology (FCT) is the national public agency supporting research in science, technology and innovation in all areas of knowledge. It is a special regime public institute under the supervision and oversight of the Ministry of Education, Science and Innovation.
National	COMPETE	The Managing Authority of the Competitiveness and Internationalisation Operational Programme (COMPETE) is a structure within the State's Central Administration. It is a reference institution for granting incentives to promote competitiveness and internationalisation, fostering the consolidation of competitive advantages.
Regional	Local Action Group (GAL) - Alentejo	A Local Action Group (GAL) is a partnership made up of local representatives from the public and private sectors in a given area of intervention, representative of socio-economic activities and with its own development strategy, known as a community-based local development strategy.
Regional	Alentejo Regional Coordination and Development Commission (CCDR Alentejo)	The Alentejo Regional Coordination and Development Commission (CCDR Alentejo), is a public institute with special status, part of the State's indirect administration, with administrative and financial autonomy. It operates under the supervision of the Minister for Territorial Cohesion. Its mission includes defining and implementing regional development strategies, coordinating public policies in areas like environment, economy, and education, managing cohesion policies within EU programming, and providing technical support to local authorities.

Table 8: Portuguese National and Regional Funding in the I4-GREEN Regions

7. Regional Policy Mixes

Regional policy mixes are tailored combinations of policies, instruments, and measures designed to address the unique socio-economic and environmental conditions of a region. They aim to promote sustainable development by leveraging local strengths, fostering innovation, and enhancing competitiveness. In the context of transitioning towards circular and sustainable economic models, regional policy mixes play a crucial role in aligning local strategies with broader EU goals, such as those outlined in the European Green Deal and Cohesion Policy.

7.1. Definition and Components of Regional Policy Mixes

A regional policy mix is an integrated framework that combines various policy tools, including regulatory measures, financial incentives, capacity-building initiatives, and infrastructure investments, to achieve specific economic, social, and environmental objectives. The usual components of a regional policy mix are included in table 9.

Regulatory Policies	Legislation and regulations that set standards and requirements for businesses and other stakeholders. These may include environmental regulations, waste management policies, and mandates for renewable energy use.
Financial Instruments	Grants, loans, subsidies, and tax incentives designed to support investment in sustainable projects, research and development, and innovation activities.
Innovation and Research Support	Programs that encourage research and development (R&D) activities, support knowledge transfer, and promote collaboration between academia, industry, and government.
Capacity-Building and Skills Development	Initiatives that enhance the skills and competencies of the workforce, ensuring that regions have the necessary human capital to support innovation and sustainable growth.
Infrastructure Development	Investments in physical and digital infrastructure, such as public transport systems, energy grids, and broadband networks, which are essential for enabling sustainable economic activities.

Table 9: Usual components of a regional policy mix

7.2. Identifying Potential Sources for Transition Support

Regional policy mixes are essential for identifying and mobilizing various sources of support for the transition to circular and sustainable economic models. They help regions leverage multiple funding streams and resources, aligning them with local needs and priorities. Potential sources for transition support within regional policy mixes include (table 10):

EU Structural and Investment Funds	These funds, including the European Regional Development Fund (ERDF) and the European Social Fund (ESF), provide financial support for a range of activities, from innovation and research to skills development and infrastructure investment.
National and Regional Government Funding	Many regions have access to national and regional budgets dedicated to supporting economic development, environmental protection, and social inclusion. These funds can be used to co-finance projects alongside EU funding or to support initiatives not covered by EU programmes.

Private Investment	Attracting private sector investment is a key component of regional policy mixes. By creating a favorable regulatory environment and offering financial incentives, regions can encourage private companies to invest in sustainable technologies, infrastructure, and business models.
Public-Private Partnerships (PPPs)	PPPs enable regions to leverage private sector expertise and funding for public projects, particularly in areas such as infrastructure development and service provision. They can play a crucial role in implementing large-scale sustainable projects that require significant investment.
Cluster Collaborations and Networks	Collaborations among regional clusters, businesses, research institutions, and other stakeholders can facilitate knowledge exchange, innovation, and investment in sustainability. Tools such as the European Cluster Collaboration Platform (ECCP) and European Strategic Cluster Partnerships (ESCP) help regions build networks and partnerships that drive sustainable development.

Table 10: Potential sources for transition support within regional policy mixes

7.3. Role of Regional Policy Mixes in Supporting Transition

Regional policy mixes are vital in supporting the transition towards circular and sustainable economic models by providing a coherent and strategic framework for regional development. Key roles include:

1. Aligning Local Strategies with EU Goals: Regional policy mixes ensure that local development strategies are aligned with broader EU objectives, such as the European Green Deal, the EU Circular Economy Action Plan, and the Cohesion Policy. This alignment maximizes the impact of regional initiatives and ensures coherence with EU-wide efforts to promote sustainability and innovation.
2. Promoting Innovation and Competitiveness: By combining various policy tools and measures, regional policy mixes foster a conducive environment for innovation, entrepreneurship, and business development. This enhances regional competitiveness and drives the adoption of sustainable practices and technologies.
3. Facilitating Multi-Level Governance and Collaboration: Regional policy mixes encourage collaboration among different levels of government, private sector stakeholders, research institutions, and civil society. This multi-level governance approach ensures that policies are well-coordinated, responsive to local needs, and able to leverage the strengths of various stakeholders.
4. Encouraging Systemic Change: By integrating various policies and measures, regional policy mixes promote systemic change, moving beyond isolated initiatives towards comprehensive strategies that address the root causes of unsustainability. This holistic approach is essential for achieving long-term sustainability and resilience.

7.4. Challenges and Opportunities

While regional policy mixes offer significant potential for supporting the transition to circular and sustainable economic models, they also face several challenges:

- Complexity and Coordination: Developing and implementing a coherent policy mix requires effective coordination among multiple stakeholders and policy areas. This can be challenging, especially in regions with limited governance capacity or fragmented administrative structures.
- Resource Constraints: Regions may face financial and human resource constraints that limit their ability to design and implement comprehensive policy mixes. Accessing and effectively utilizing available funding sources can be a significant challenge.
- Need for Continuous Adaptation: The dynamic nature of economic, technological, and environmental conditions requires regions to continuously adapt their policy mixes. This necessitates ongoing monitoring, evaluation, and adjustment to ensure policies remain relevant and effective.

However, there are also significant opportunities: The EU provides substantial support for regional development through various funding programmes, technical assistance, and policy guidance. Regions can leverage this support to enhance their policy mixes and drive sustainable development. Additionally, by focusing on local strengths and opportunities, regions can develop specialized niches

that enhance their competitiveness and resilience. This approach allows regions to differentiate themselves and attract investment and talent. Finally, regional policy mixes can help create vibrant innovation ecosystems that bring together businesses, research institutions, and government agencies. These ecosystems foster collaboration, knowledge exchange, and the development of new sustainable technologies and practices.

8. Cluster Collaboration Tools

Cluster collaboration tools play a crucial role in fostering innovation, supporting regional development, and driving the transition towards sustainable and circular economic models. By bringing together businesses, research institutions, and public authorities, clusters create an environment for knowledge sharing, cooperation, and joint action, leading to enhanced competitiveness and innovation capacity. In the context of the EU's sustainability goals, cluster collaborations provide essential support for developing new technologies, business models, and best practices that align with the principles of sustainability and circularity.

8.1. European Cluster Collaboration Platform (ECCP)

The European Cluster Collaboration Platform (ECCP) is a central initiative of the European Commission aimed at fostering collaboration between clusters across Europe and beyond. The ECCP serves as a comprehensive online platform that provides information, networking opportunities, and support for cluster organisations and their members.

Its objectives are to (1) enhance cooperation between clusters within the EU and internationally, (2) provide clusters with access to resources, tools, and best practices for innovation and sustainability, and (3) facilitate partnerships between SMEs, research institutions, and larger enterprises to develop innovative solutions in key sectors such as energy, manufacturing, and environment.

The ECCP has become an important resource for cluster managers, helping them connect with other clusters, access EU funding opportunities, and share knowledge on transitioning to more sustainable business practices. It also enables clusters to collaborate on joint projects that foster innovation, technology transfer, and regional economic development. To achieve this, the ECCP offers several tools, including a cluster mapping tool to identify clusters in specific sectors or regions, a matchmaking tool to foster collaboration between different clusters and their members and resources and guidelines on innovation, sustainability, and internationalisation.

8.2. European Strategic Cluster Partnerships (ESCP)

The European Strategic Cluster Partnerships (ESCP) initiative supports interregional collaboration by encouraging clusters to work together across borders to strengthen the competitiveness of European industries. The ESCPs focus on specific sectors, fostering innovation and promoting the development of new markets, technologies, and business models. These partnerships are often aligned with the EU's strategic goals, including the transition to sustainable and circular economies.

The ESCPs (1) strengthen collaboration between clusters from different regions and sectors to develop joint strategies, projects, and initiatives, (2) promote cross-border cooperation to improve the competitiveness of European industries, and (3) encourage the uptake of innovative technologies and sustainable practices across different sectors. As a result, they facilitate knowledge transfer between regions and industries, promoting the adoption of new, sustainable technologies and business practices. By encouraging clusters to collaborate across borders, the ESCPs help to scale innovative solutions and create a stronger European presence in global markets.

The ESCP-4i focuses specifically on supporting the internationalisation of clusters and SMEs, helping them enter global markets by building on Europe's strengths in innovation and sustainability.

8.3. Importance of Cluster Collaborations in Supporting Transition

Clusters and cluster collaboration tools are vital for driving the transition to a circular and sustainable economy. They provide a structured way to foster cooperation, knowledge sharing, and joint innovation

between different stakeholders, including businesses, research institutions, and public authorities. By leveraging the strengths of diverse players, clusters can help accelerate the development and adoption of new technologies and business models that support sustainability.

Key ways in which cluster collaboration tools support the transition are presented in table 11.

Fostering Innovation and Knowledge Transfer	Clusters act as innovation ecosystems, facilitating knowledge transfer and cooperation between companies, research institutions, and other stakeholders. This collaboration is essential for developing innovative products, processes, and services that promote resource efficiency, waste reduction, and renewable energy use.
Promoting Internationalisation and Competitiveness	Through platforms like the ECCP and ESCP, clusters are able to access new markets, establish international partnerships, and develop cross-border projects that scale up successful innovations. This enhances the competitiveness of European SMEs and helps them tap into global markets for sustainable solutions.
Supporting SMEs in Green and Digital Transition	Cluster collaboration tools provide SMEs with the resources and partnerships necessary to transition to greener, more sustainable business practices. This includes access to funding opportunities, technical support, and knowledge-sharing platforms that help them adopt digital and green innovations.
Building Capacity for Sustainable Growth	By engaging in collaborative projects focused on sustainability, clusters contribute to building capacity at the regional and local levels. They help regions develop the necessary infrastructure, expertise, and business models to transition to more sustainable economic practices

Table 11: Cluster collaboration tools' key support points.

9. Case Studies

9.1. Case Study 1: INNOSUP-01 MINE.THE.GAP Collaboration for Raw Materials in Europe

The MINE.THE.GAP project is a European initiative (coordinated by ICAMCYL and supported by I4-GREEN consortium partners ISMC and ACPMR) granted through the INNOSUP-01 instrument (H2020 programm), designed to support SMEs in the mining and raw materials sectors by fostering collaboration and innovation. The project connected raw material SMEs with technology providers to develop sustainable solutions for resource extraction and processing. MINE.THE.GAP provided SMEs with access to funding and technical expertise to adopt innovative technologies that reduce environmental impacts and improve resource efficiency.

From 2020 to 2023 the project supported cross-sectoral collaboration between mining companies and technology providers, fostering innovation in digitalisation and green technologies. SMEs participating in the project have been able to adopt new technologies that reduce their environmental footprint, enhance operational efficiency, and create new market opportunities. The project has strengthened collaboration between European clusters, fostering knowledge sharing and the dissemination of best practices across regions.

INNOSUP-01 promoted the circular economy in the raw materials value chain, focusing on recycling and waste management solutions. Currently, within the Horizon Europe program, the INNOSUP actions fall under the European Innovation Ecosystem.

9.2. Case Study 2: Cluster Collaboration for Sustainable Manufacturing in Baden-Württemberg, Germany

In Baden-Württemberg, Germany, the Sustainable Manufacturing Cluster brings together businesses, research institutions, and government agencies to promote innovation in sustainable production processes. The cluster leverages the ESCP framework to enhance cross-border cooperation and foster circular economy practices.

The cluster focuses on reducing waste, increasing energy efficiency, and adopting eco-friendly materials in manufacturing processes. Collaboration with the ECCP has enabled the region to establish partnerships with clusters across Europe, facilitating knowledge exchange and the adoption of best practices.

The cluster has received financial support through the ESIF to develop pilot projects in resource efficiency and green manufacturing technologies.

The cluster's activities have contributed to a more sustainable manufacturing sector in the region, with measurable improvements in resource efficiency and waste reduction. By integrating sustainability into its industrial base, Baden-Württemberg has attracted investment and enhanced its reputation as a hub for green manufacturing innovation.

9.3. Case Study 3 : Green Mining in Finland

Finland is one of Europe's key mining regions, and it has taken a proactive approach to ensure that mining activities are aligned with sustainability principles. The Finnish Green Mining Programme, launched by Tekes (now Business Finland), focuses on improving the environmental impact of mining operations while ensuring economic competitiveness.

The programme supports the development of new technologies that minimize the environmental footprint of mining activities, including waste management and water recycling systems. It promotes the exploration of raw materials with reduced environmental and social impacts, in line with EU goals for sustainable resource extraction. Public and private sectors collaborate closely to integrate sustainability into mining practices, with a strong emphasis on stakeholder engagement and social responsibility.

Finland has become a leader in sustainable mining practices, reducing environmental degradation associated with traditional mining activities. The country's focus on innovation has attracted international interest and investment, positioning Finland as a model for green mining globally.

10. Analysis. The importance of Financial Instruments in supporting Sustainable Transition in the Mining Sector

The financial instruments available at both EU and sub-EU levels are crucial in driving the transition to circular and sustainable economic models. By providing targeted support for research, innovation, infrastructure, and capacity building, these instruments help regions develop the necessary capabilities to achieve sustainable growth. They also facilitate the sharing of knowledge and best practices across borders, promoting a collaborative approach to addressing common challenges.

Moreover, these financial instruments help de-risk investments in new technologies and business models, encouraging private sector participation and fostering a conducive environment for innovation and entrepreneurship. By aligning financial support with broader policy objectives, such as the European Green Deal and the EU's Cohesion Policy, these instruments ensure that economic development is both inclusive and sustainable, contributing to long-term prosperity and resilience across Europe.

In summary, the diverse range of financial instruments available at the EU and sub-EU levels plays a pivotal role in supporting regions in their transition to circular and sustainable models for mining. By leveraging public and private resources, these instruments enable regions to capitalize on their unique strengths and opportunities, driving innovation, sustainability, and economic growth in line with the EU's strategic objectives.

The mining sector is essential for supplying critical raw materials required for green technologies such as renewable energy, electric vehicles, and energy storage. However, the potential environmental and social impacts of traditional mining practices can be significant and discard

potential sources of raw materials as mining waste, making the transition toward more sustainable methods a priority. Financial instruments play a critical role in supporting this transition by providing the necessary capital, reducing risk, and incentivizing investment in sustainable practices.

Funding mechanisms like Horizon Europe and the European Innovation Council offer grants and equity investments for R&D projects focused on sustainable mining technologies. This funding accelerates the development of advanced extraction methods, materials recycling, and energy-efficient processes that are vital for reducing the sector's environmental impact. For instance, research into low-impact mining techniques -such as in-situ mining, which minimizes surface disruption- is increasingly being funded by EU innovation instruments, ensuring that the sector moves toward more sustainable practices while meeting growing demand for critical raw materials.

The I4-GREEN project is an example of how European funding can allow to test innovative sustainable technologies through pilots and provide further impact through replication analysis and the involvement of the quadruple helix (industry, academia, government and community).

Sustainable mining projects often face high upfront costs and long payback periods, which can make them unattractive to investors. Blended finance instruments -combining public and private capital- help to de-risk these investments by offering guarantees, first-loss capital, or interest subsidies. These mechanisms encourage private investors to enter the sustainable mining sector, where the risks may otherwise be perceived as too high.

Financial instruments such as sustainability-linked loans encourage mining companies to invest in cleaner technologies, including renewable energy sources, electric mining equipment, and improved waste management systems (including initiatives like re-mining waste, recycling metals, and reducing resource extraction through technological innovation.). These investments are essential for reducing the carbon footprint and environmental degradation traditionally associated with mining operations.

11. Challenges and Opportunities

European, national and regional Transition Support Instruments have associated challenges, but also opportunities.

One of the most obvious challenges is the complex regulatory landscape and inconsistencies between regions. The European, national, and regional authorities often operate under different frameworks and regulations, which can create fragmentation in policies, programs, and incentives. These discrepancies complicate the harmonization of sustainability and circularity goals, making it difficult for companies and stakeholders to navigate. It is also important to consider that national and regional funding mechanisms vary widely in terms of availability, scope, and focus. Smaller regions or countries with less economic capacity might struggle to offer significant support, leading to unequal progress across Europe. This adds to the complexity of the search for thematically aligned open calls and the search for partners.

Additionally, although the transition to circularity requires innovation in raw material sourcing, processing, and recycling technologies, there are still significant gaps in the development of technologies that enable efficient circular practices. This issue is exacerbated by varying levels of industrial readiness and research capacity across Europe.

Moreover, aligning the objectives of the public sector (which focuses on long-term sustainability) with the short-term profitability needs of the private sector remains a significant challenge. The private sector may hesitate to invest in circular solutions without clear, consistent, and supportive frameworks or financial incentives.

At an international level the complication increases, since European companies and regions often face competitive pressures from international markets where sustainability regulations are less stringent. This can undermine efforts to create a level playing field for companies that adopt circularity principles, as they may face higher costs compared to competitors operating in more lenient environments.

However, there are many opportunities for the sector due to the growing momentum toward the harmonization of sustainability and circular economy frameworks at the EU level. The European Green Deal and the Circular Economy Action Plan are examples of efforts to create unified strategies, making it easier for industries and regions to adopt best practices across Europe. Support instruments (such as the InvestEU program and the Just Transition Mechanism) provide financial incentives that can stimulate investment in sustainable and circular raw materials. Public-private partnerships (PPPs) can play a key role in scaling innovations and de-risking investments in technologies and processes that are essential for the circular economy. Regional support instruments can help build innovation hubs that specialize in circular economy initiatives. These hubs can bring together research institutions, industries, and government entities to share best practices, co-develop new technologies, and foster cross-border collaboration, particularly in regions with a strong raw material extraction or manufacturing base.

12. Conclusions

As sustainability becomes a core requirement for businesses globally, companies that are early adopters of circularity in Europe can gain a competitive edge. Support instruments that help businesses transition to circular models could position Europe as a leader in sustainable raw material use, with positive long-term effects on trade and economic resilience.

Financial instruments are pivotal in driving the sustainable transition of the mining sector. They help overcome the significant financial and operational risks associated with adopting greener practices by providing targeted funding, de-risking mechanisms, and incentives for innovation. As the demand for critical raw materials rises in response to global decarbonization efforts, these instruments ensure that the mining sector can align with the EU's Green Deal and broader sustainability goals while maintaining economic competitiveness.

The transition support instruments presented in this document, and the related calls identified in this document present an opportunity for entities in the mining sector to tackle improvement of sustainability and circularity in their industries.

13. Resources

- Dominique Foray. "Smart Specialisation: Opportunities and Challenges for Regional Innovation Policy" ISBN: 978-1316603493
- European Commission, “EUREKA”
- European Commission, "European Structural and Investment Funds (ESIF)"
- European Investment Bank, "European Fund for Strategic Investments (EFSI)"
- European Court of Auditors, "EU funding for innovation in business: enhanced coherence and concentration needed" (Special Report No 2, 2020)
- European Commission, "European Innovation Partnership (EIP) on Raw Materials"
- European Commission, "Clusters and Industrial Transformation"
- European Cluster Collaboration Platform (ECCP)
- European Commission, "Cohesion Fund"
- European Commission, "Cohesion Policy"
- European Commission, "European Green Deal"
- European Commission, "Horizon Europe"
- European Commission, "Innovation Fund under the EU Emissions Trading System (ETS)"
- European Commission, "Innovation and Modernisation Funds"
- European Commission, "LIFE Programme"
- European Commission, "European Strategic Cluster Partnerships (ESCP)"
- European Commission, "European Structural and Investment Funds"
- European Commission, "Smart Specialisation Platform"
- European Commission, "Guide to Research and Innovation Strategies for Smart Specialisations (RIS3)"
- European Commission, "Strategic Implementation Plan for the European Innovation Partnership on Raw Materials"
- European Innovation Council and SMEs Executive Agency, "INNOSUP-01 MINE.THE.GAP Project".
- European Court of Auditors, "EU support for innovation in businesses"
- Foray, D., et al. (2012). "Guide to Research and Innovation Strategies for Smart Specialisation (RIS3)"
- European Strategic Cluster Partnerships (ESCP)
- Foray, D., Goddard, J., Goenaga Beldarrain, X., Landabaso, M., McCann, P., Morgan, K., Nauwelaers, C., and Ortega-Argilés, R. (2012). "Guide to Research and Innovation Strategies for Smart Specialisation (RIS3)"
- McCann, P., and Ortega-Argilés, R. (2015). "Smart Specialisation, Regional Growth and Applications to EU Cohesion Policy": DOI: 10.1080/00343404.2015.1007931
- Regional Innovation Monitor Plus by the European Commission:
- OECD "Innovation-Driven Growth in Regions: The Role of Smart Specialisation"
- OECD, "Smart Specialisation Strategies: Regional Policy and Innovation"