ESM Pilot

Efficient and Sustainable Manufacturing Pilot

2025 Action Report & 2026 Planning

February 17, 2026

Co-coordinated by: AFIL, Polymeris, Cardiff Metropolitan University

ESM brief

- Launched in 2015

- 3 coordinating regions

Lombardy - Auvergne Rhone Alpes - Wales

AFIL
Associazione Fabbrica Intelligente Lombardia

POLYMERIS

Cardiff Metropolitan University | Prifysgol Metropolitan Caerdydd

- Linked to S3 Industrial Modernization TSSP

ESM network

Partner Regions *(2026)*

COORDINATING REGIONS

Lombardy - Auvergne Rhone Alpes - Wales

AFIL Associazione Fabbrica Intelligente Lombardia

POLYMERIS

Cardiff Metropolitan University | Prifysgol Metropolitan Caerdydd

13 PARTICIPATING VI REGIONS

- East Netherlands
- Emilia Romagna
- Flanders
- Friuli Venezia Giulia
- Lombardia
- Lower Saxony
- Malopolska
- Norte
- Saxony
- South Netherlands
- Wallonia
- Wales
- (AuRA)Polymeris

INTERESTED REGIONS

- Aragon
- Asturias

ESM objectives

The main objective of the Efficient and Sustainable Manufacturing (ESM) Pilot network is to ***integrate*** a multidisciplinary set of ***advanced and innovative enabling technologies and digital innovations*** (TRL 7-8) and to exploit the ***regional Smart Specializations*** in synergic way to offer services to European end-users, mainly manufacturing companies, to solve specific ***industrial challenges*** related to their products.

MANUFACTURING EFFICIENCY

- increase throughput
- improve quality
- reduce costs

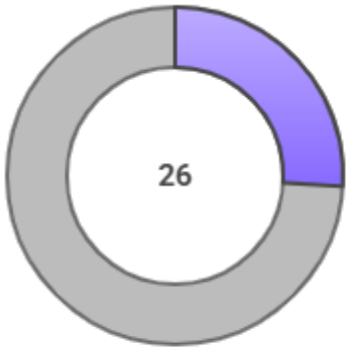
MANUFACTURING SUSTAINABILITY

- reduce energy and materials consumption
- reduce emissions
- increase the inclusion of humans in the factories

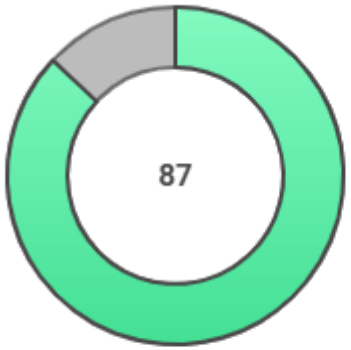
ESM mapping

Steering Committee 24			
Cluster	RTO	Intermediary/consultant	Authority
6	13	3	2

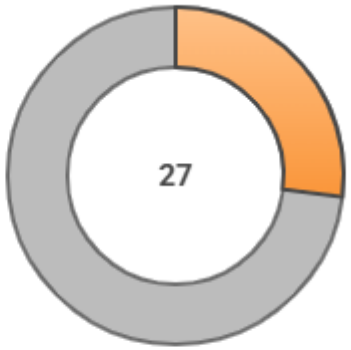
Members 221			
Cluster/industrial	RTO	Intermediary/consultant	Authority
26	87	27	56 (21 Regions)



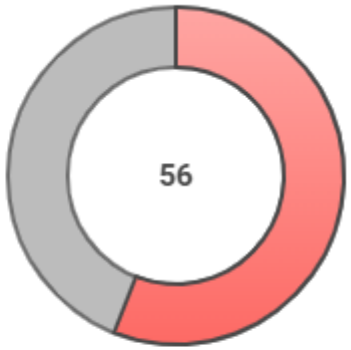
Cluster/Industrial Category



RTO (Regional Training Organization)

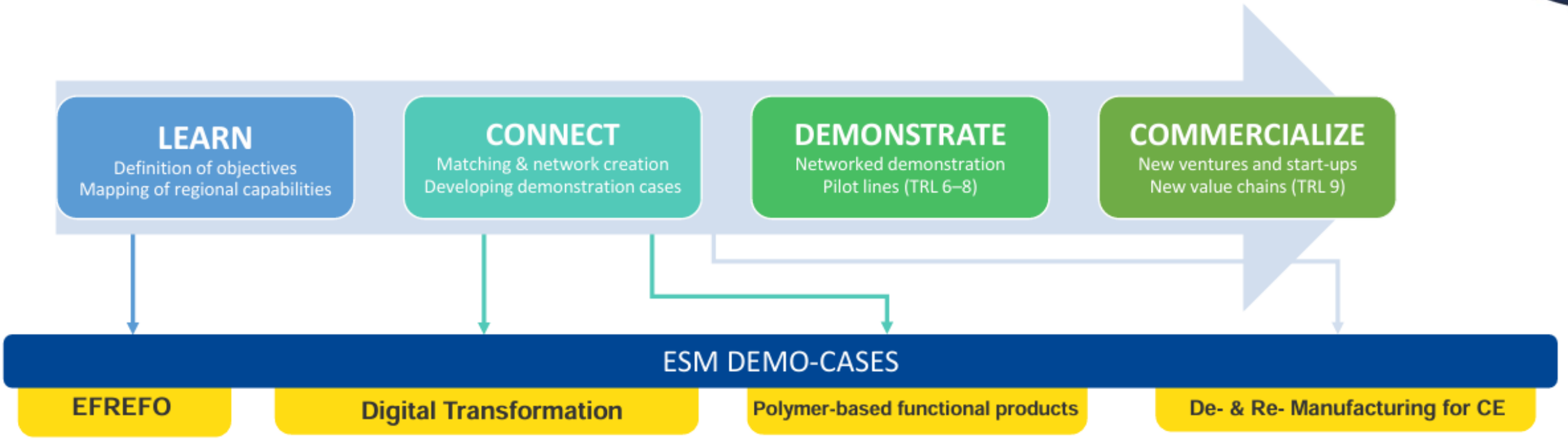


Intermediary/Consultant Category



Authority

ESM main action steps



Linked pilots

Smarth Health

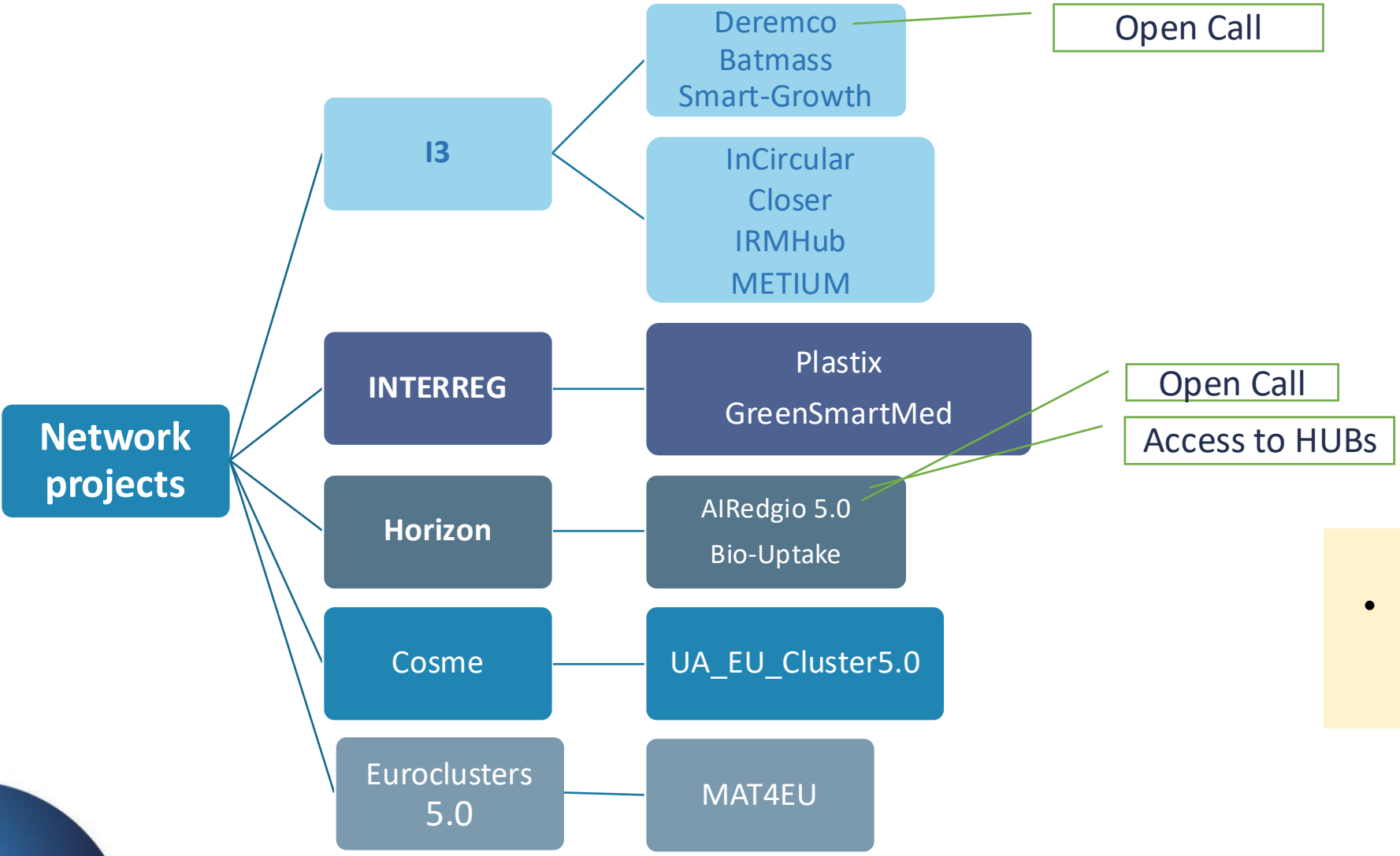
High performance through 3D

AI

ESM 2025 main outcomes

+ 4 funded projects
+ 9 proposals

Funding key achievements



Past Projects

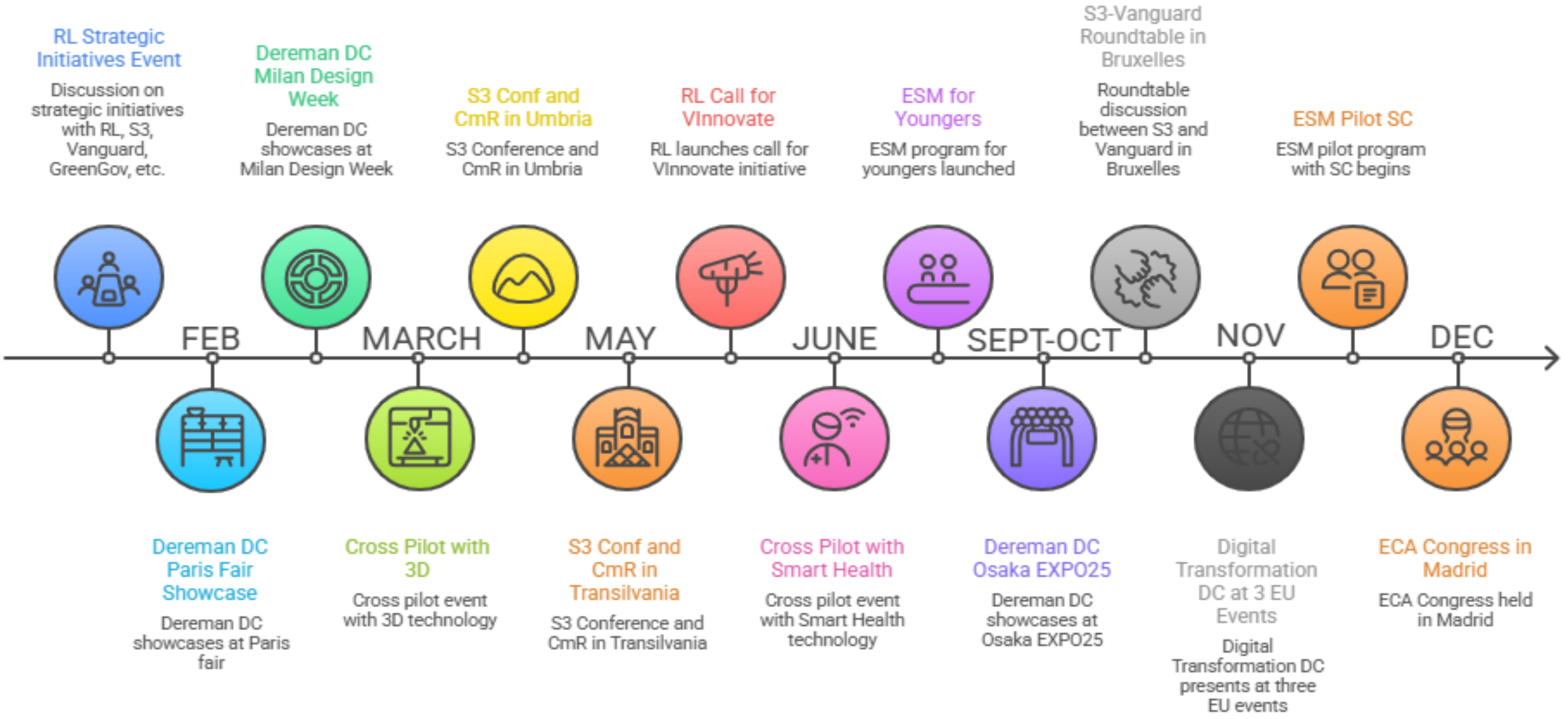
- **DigiPrime**
- **FiberUse**

Project proposals

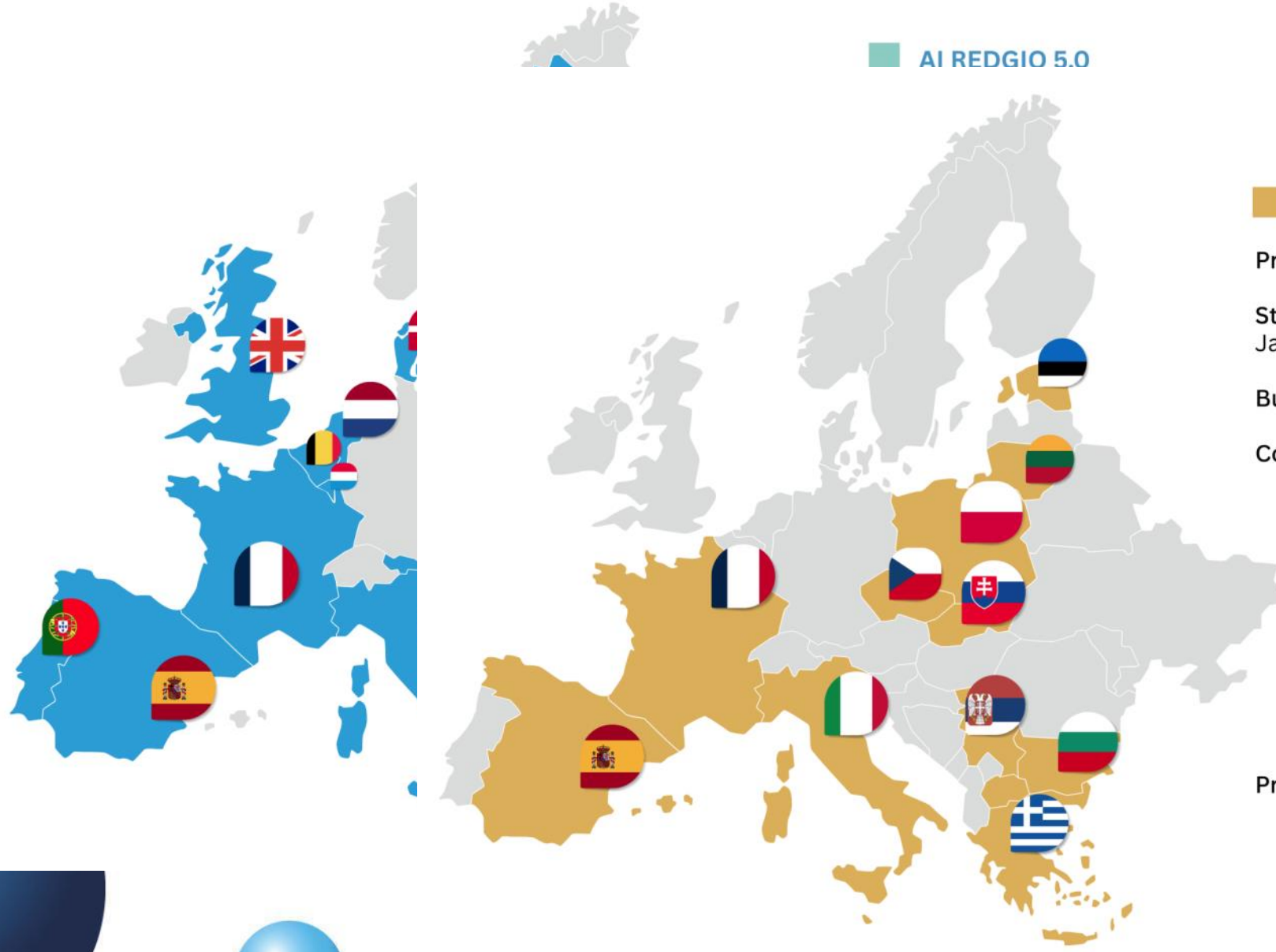
- **I3 and Horizon have been drafted**
  - **2 Erasmus**
  - **2 Alpine Space**

Vinnovate: 7 proposals evaluated linked to ESM

ESM 2025 key events



ESM projects mapping



IRMHUB

Program: I3 EISMEA

Start and End of the project:
January 2025 / December 2026

Budget: 1.340.490,12 €

Consortium:

- Andalusia (Spain)
- Asturias (Spain)
- Attica (Greece)
- Castile and León (Spain)
- Estonia
- Liberec (Czech Republic)
- Lithuania
- Île-de-France (France)
- Lazio (Italy)
- Eastern Macedonia (Greece)
- Madrid (Spain)
- Masovia (Poland)
- Prague (Czech Republic)
- Sardinia (Italy)
- Serbia
- Eastern Slovakia
- Southwest Bulgaria (Yugozapaden)

Project coordinator: DUTH (Macedonia Orientale - GR)

ESM running networked projects

Pilot/Democase	Name	Call	
De-Reman	BatMass	I3	Organization of workshops and events related to the development of a European Circular Battery Valley
Polymer-based functional Products	InCircular	I3	
Cross pilots	Plastix	Interreg	Identify best practices and interregional initiatives related to sustainability and circularity in the plastics sector
Digital Trasformation	AI Redgio 5.0	Horizon	Extend the AI REGIO approach by taking into account the principles of Industry 5.0, AI-at-the-edge, and the EDIH network."
De-Reman	DeremCo	I3	Establish a systemic, cross-sectoral, demand-driven, and circular approach for the reuse of composite materials and components in new high value-added products
ESM Pilot	Smart Growth	I3	Support for dissemination and synergies with EU clusters related to the application of AI in the manufacturing processes of synthetic crystals for higher efficiency and quality
Cross-democases	GreenSmartMed	Interreg	Development of a methodology in the sectors of machinery, textiles, plastics, agri-food, and batteries for international cooperation towards sustainable and resilient manufacturing
De-Reman	Closer	I3	Support for dissemination, market analysis, and exploitation related to circular economy applications in the semiconductor industry
Cross-democases	IRMHub	I3	Development of an interregional circular network on raw materials
Cross-democases	UA_EU_Cluster5.0	Cosme	Sharing regional experiences to foster Ukraine manufacturing clusters
De-Reman	Charge	Interreg	Powering Green Transition
Polymer-based functional Products	MAT4EU	Euroclusters	New and circular materials
De-Reman	METIUM	I3	Urban mining ecosystem

Q&A on 2025 results

(Regions subscribed to pilots & involved actors and interested regions)

ESM 2026 rescoping

The main objective of the Efficient and Sustainable Manufacturing (ESM) Pilot network is to ***integrate*** a multidisciplinary set of ***advanced and innovative enabling technologies and digital innovations*** (TRL 7-8) and to exploit the ***regional Smart Specializations*** in synergic way to offer services to European end-users, mainly manufacturing companies, to solve specific ***industrial challenges*** related to their products.

Flexible
Small lots
Zero defects
Remote control

MANUFACTURING EFFICIENCY

- increase throughput
- improve quality
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MANUFACTURING SUSTAINABILITY

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Advanced/Smart materials
High Value material mining
Produce Sustainability

De- & Re-Manufacturing

Digital Transformation

EFREFO
Energy-flexible and resource-efficient factory operation

Polymer-based functional products

Upcoming ESM challenges

Twin transition offers some opportunities, are SMEs ready to help value chains competitiveness?

Advanced materials

- more sustainable
- smart polymers
- machining

Demanufacturing

- Products are designed to last (alap)
- Automate a non-standard feeding (DPP)
- Necessary who will collect and prepare the raw material or reman subsystems
- Useful example of final use

Machine design and Servitization

- Simulation and DT
- Human interface and coboting
- Remote control & maintenance
- Billing
- Financial flow

iAM-i an unavoidable base for ESM and 3D printing

Advanced Materials are materials designed or engineered to deliver new or enhanced properties or structural features for improved functionality and/or specific applications. They span the range from traditional advanced materials and their enhanced variants to the latest emerging materials

Advanced ceramics, smart glass, nanomaterials, specialized alloys, graphene…

Self-healing concrete, pollution-absorbing bricks, aerogel insulation, bamboo-reinforced composites…

Perovskites, solid-state electrolytes, permanent magnets, nano-structured catalysts, phase-change materials…

Carbon fiber composites, high-strength steel, nanocoatings, solid-state battery electrolytes, advanced polymers…

Sensors, 3D printable biopolymers, hydrogels,shape-memory alloys, conductive polymers …

Europe's Advanced Materials R&I ecosystem needs the Advanced Materials Act to be a holistic, consistent and coordinated framework that complements the Critical Raw Materials Act, the Net Zero Industry Act, the Industrial Accelerators Act… and goes beyond

Promote **flexible, EU-compliant Local Content Requirements (LCRs)** that prioritise European strategic AM in public and strategic investments.

Tackle lack of European competitiveness against from-outside-EU imports by ensuring a **fair and robust level playing field**

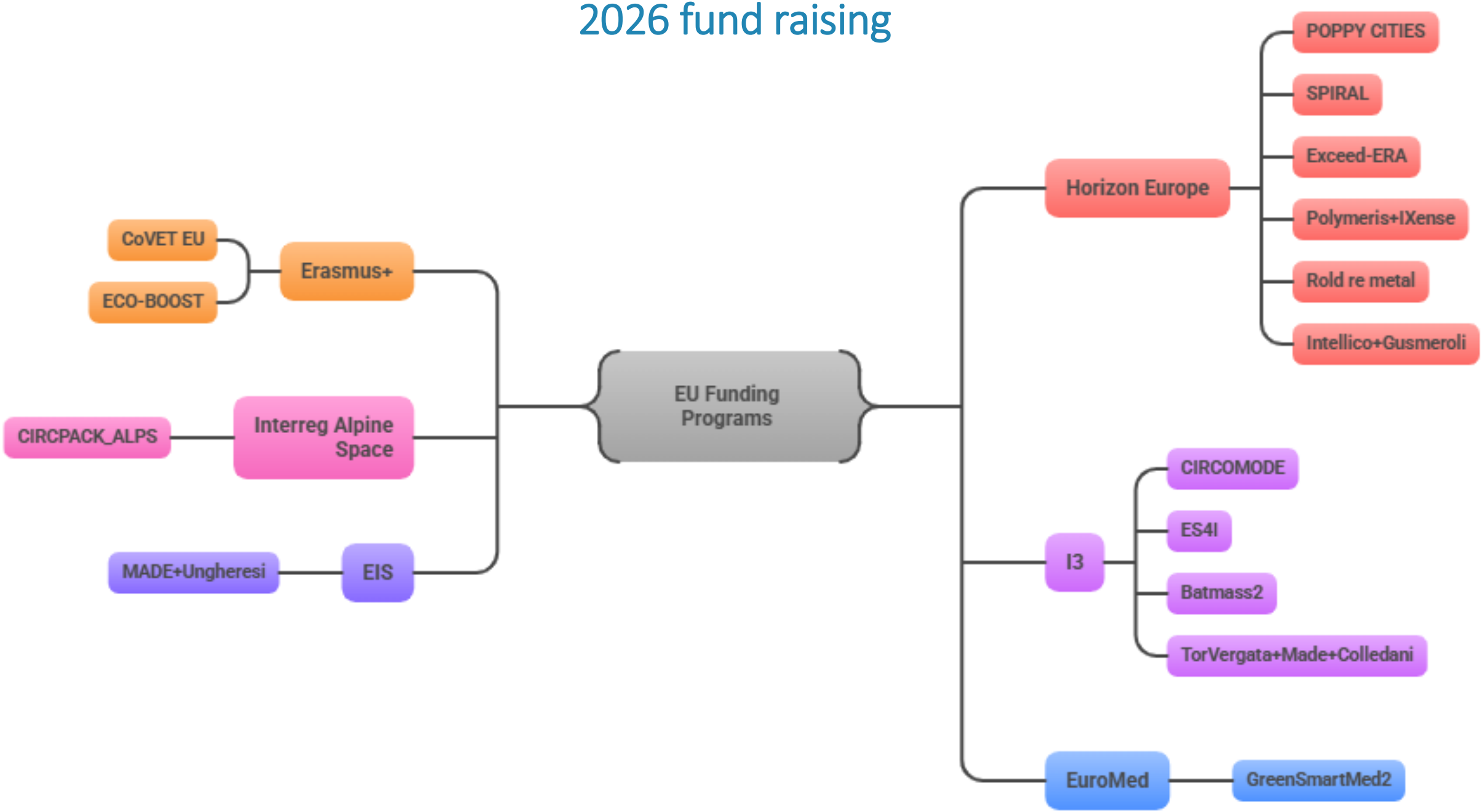
Simplify and accelerate regulatory processes through fast-track certification, validation, and standardization.

Strengthen overall **research and technology capabilities and capacities** and associated services to accelerate innovation and reduce cost and time-to-market.

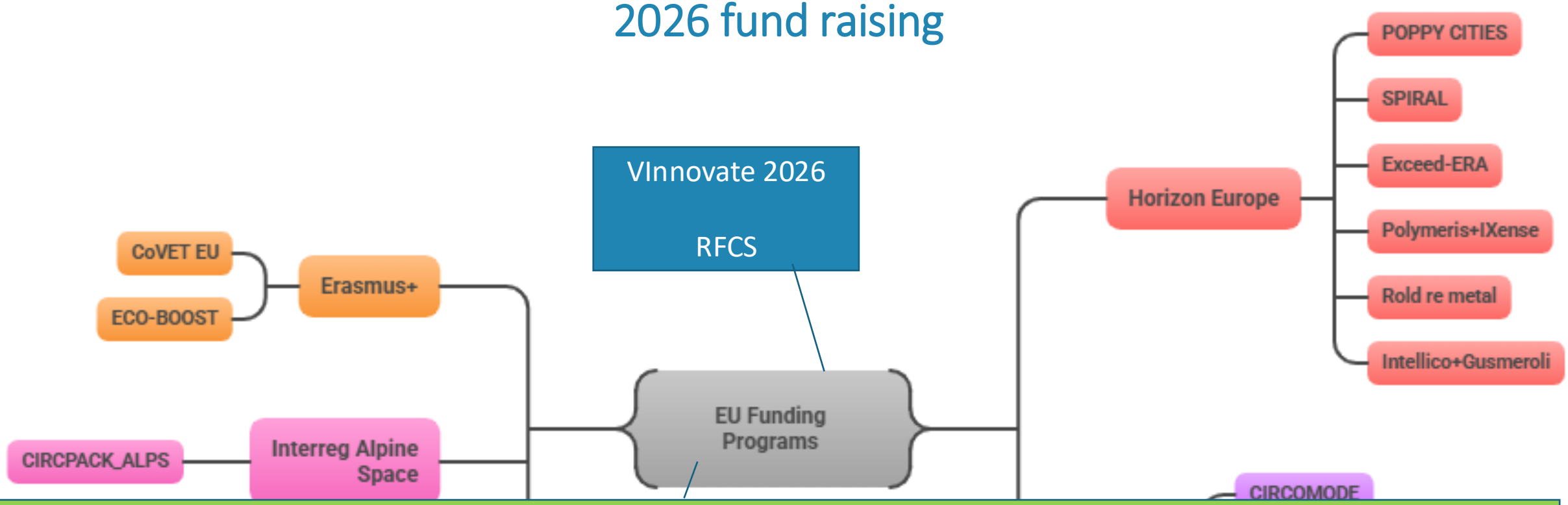
Ensure funding covers the **lab to market and to scale journey** to allow support for pre-deployment, first industrial deployment, scaling up & ramping up

Establish **federated data ecosystems on materials data** (Materials Commons) as a digital infrastructure for data, modelling, and AI-driven design.

2026 fund raising



2026 fund raising



HORIZON-CL4-2026-01-MAT-PROD-04: Optimise the usage of resources in a circular economy
HORIZON-CL4-2026-01-MAT-PROD-05: Circular innovative advancedmaterials
HORIZON-CL4-2026-01-MAT-PROD-14: Improving availability of secondary raw materials recycling
HORIZON-CL4-2026-02-DIGITALEMERGING-51-twostage: AI improved advanced manufacturing
HORIZON-CL5-2026-03-D3-12: Long-lifetime and optimised use of materials in recyclable process
HORIZON-CL5-2026-03-D3-13: Industrial scale up and circularity pathway for IPV technologies
HORIZON-CL6-2026-01-CIRCBIO-02: Advancing recycling technologies textiles
HORIZON-CL6-2026-01-CIRCBIO-03: Advanced recovery of critical raw materials from Waste from Electrical and Electronic

2026 benefits

Key actions enhancements	Key expected benefits
From project calls to ecosystemic collaboration calls	Continue collaboration after deadlines and if not succesful
Test two pilot studies	See in methodologies can be applied to other pilots/regions
Mapping needs	Complementary or overlapped expecially regarding pilots merging
New democase	Widening ESM scope to a very large domain
From project objectives to industrial applications	Linking advanced materials to machining and final products
Present first 2025 Vinnovate outcomes	Scale up of ideas or enterprises
New collaboration with S3 CoP service provider	New services provided
Involvements of SMEs	Increasing number of SMEs in EU opportunities

2026 program

Activity	Date	Status	info
Democasse update	Every 2 months	Ongoing	Strategic Communities @ AFIL
Open Innovation action	2026	To be started	
Presentation to Quebec economic delegation	22 Jan	Done	In presence event
ESM Pilot event	18 march (TBC)	scheduling	Regione Lombardia premises Bruxelles
NLs	Feb, June, Nov	TBD	
Call with prospect parters	June	ongoing	NE-Romania, Gallicia, Mobinov, InnovateUK, Cardiff Met, Basque KIC, CAAR Aragon
S3 conference	TBD	TBD	New supplier
Presentation Vanguard/ESM	TBD	To be done	CmR
Vinnovate info session	TBD	To be scheduled by RL	Online (ESM partners)
Smart Polymers Congress	17 November Milan		With Polimerys and Lombardy Region Gov
ESM Pilot Event	18 November		Milan side to SPC
Cross Pilot event	2/4 TBD	TBD	3D/AI/Smart Health
Ecosystem data analysis	2026	To be started	
Pilot Steering Committee	March and November	TBD	online

New startup mapping based on DCs enterprises innovation needs

MAIN AREE	IMPACT ON MANUFACTURING		
IoT	■	■	■
Aluminium Additive	■	■	
Carbon free Technology	■	■	■
Plant-based Polymers & Biomaterials	■	■	
Advanced Imaging & Image Recognition	■	■	■
Robotics	■	■	■
Bar-codes	■	■	■
Carbon Nanofibers	■	■	
Synthetic Biology	■		
Fiber Composited	■	■	
Blockchain	■	■	
Batteries	■	■	■
3D print	■	■	

MAIN AREE	IMPACT ON MANUFACTURING		
Plastics And Polymer Engineers	■	■	■
Digital Platform	■	■	■
Acoustic Physics	■	■	■
Internet of Waste	■	■	■
Bioenergy	■	■	
AI	■	■	
Chemical Recycling Technology	■	■	■
QR code	■	■	
Digital Twin	■	■	■
RFID	■	■	
Automation	■	■	■
Real-Time Monitoring	■	■	■
ESG Data	■	■	■

ESM startup solutions mapping

Skipso, con il supporto di AFIL, ha esaminato oltre 500 i
acce
capit
ident
plasn
mani

1 **Secure and Sustainable Food Manufacturing**

2 **Smart Components**

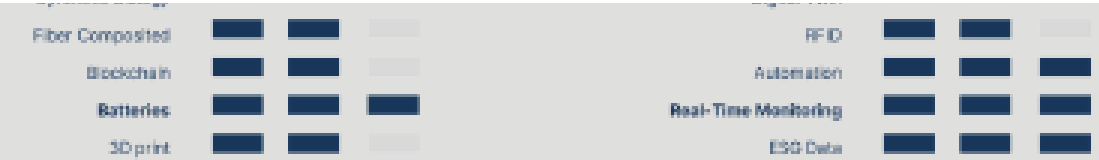
6 **Additive Manufacturing**

5 **De- and Remnaufacturing for Circular Economy**

- Battery
- Textile Recycling
- Sustainable Iron

MAIN AREE

Plant-bas
Advanced in



Startups

XYLENE

xylene.io Italia

Xylene è un fornitore leader di soluzioni di tracciabilità end-to-end attraverso la sua innovativa piattaforma Digital Product Passport (DPP). La piattaforma fornisce una soluzione completa e integrata per la gestione della supply chain. Inoltre consente alle aziende di tracciare e monitorare i loro prodotti lungo l'intero percorso, dalla fase di approvvigionamento fino al consumatore finale.

BI-REX

www.bi-rex.net Italia

Bi-rex si distingue per le soluzioni sostenibili trasformando i rifiuti agroalimentari in fibre di alta qualità, Fibra 1.0 per carta e imballaggi di lusso e Fibra 2.0 per il settore tessile. Oltre ai prodotti, offre consulenza R&D, analisi di laboratorio. Dal paper free da alberi alla plastica sostenibile, il nostro approccio innovativo trasforma i sottoprodotti agricoli in materiali versatili, contribuendo a un futuro più verde.

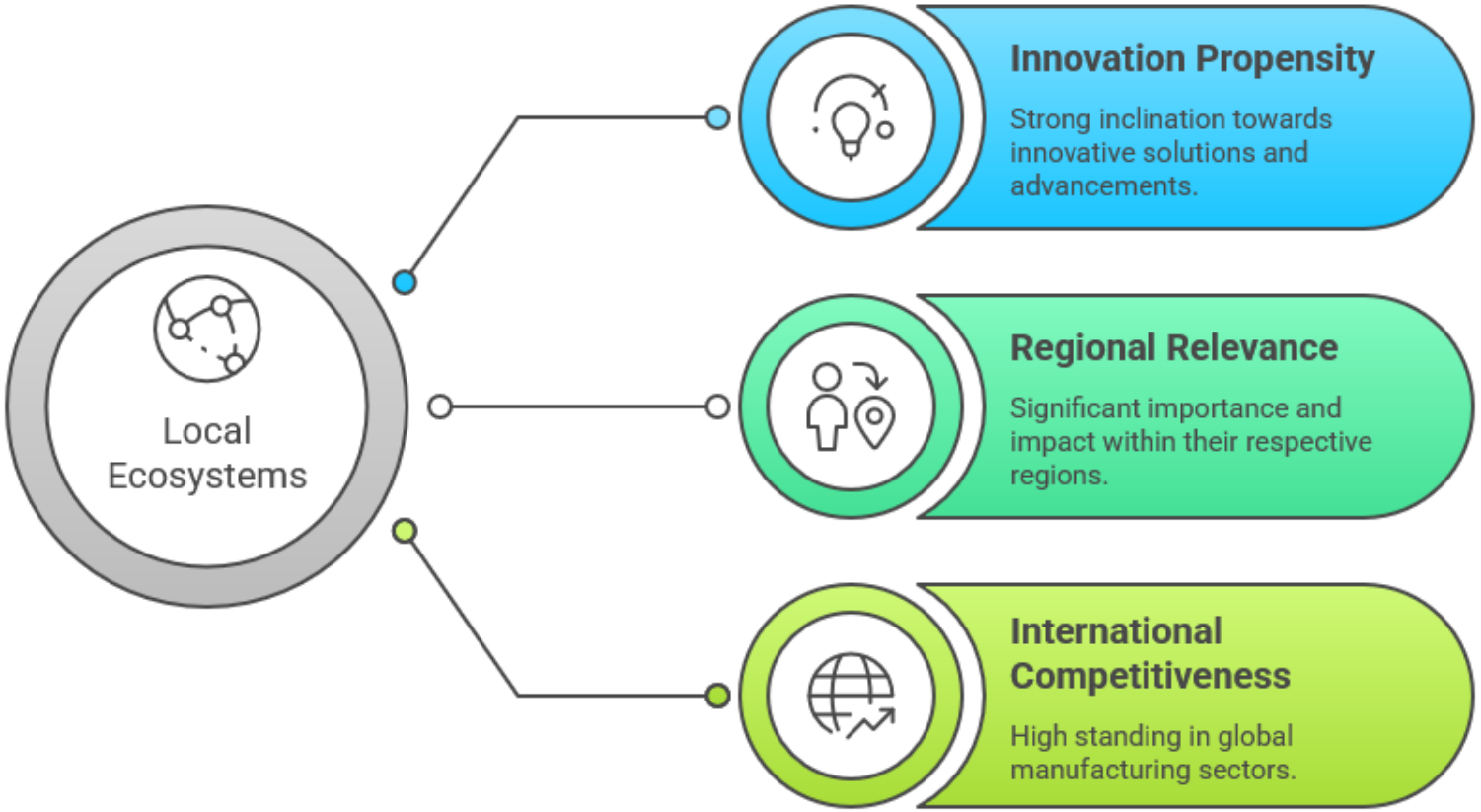
Policy framework: legislation, supports, tools, capacity building

Testing specific flavours of tech solutions

RTOs
Research
Developing tech to meet needs

Bridge Orgs
Knowledge transfer and solutions
Closing the gaps

SMEs
Improve processes to be competitive
Extract the value by products



Topics for Plenary events in 2026

Open discussion:
Most relevants EU initiatives (S3, CmR, RIS) impacting ESM
Models and practices

Needs
Do we know other regions pilot related needs?
More integrated projects, via DCs?
Collaboration vs competition
New challenges….new opportunities

Resources
Mapping DCs-S3-RTOs? (Via survey)
Collaboration platforms and OI
Regional Experiences exchange
Business impact via DCs
Dissemination material & Events?

Interested Regions
- NE-Romania
- Galicia

Q&A on 2026 planning

(Regions subscribed to pilots & involved actors and interested regions)