



Interoperable Remote Health Innovation Brought to Scale

S3 POLICY GUIDE

AUTHOR: IVITA



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Versions Table

Issue	Date	Description	Author(s)
1.0	10/01/2025	S3 Policy Guide (draft)	iVita
2.0	11/24/2025	S3 Policy Guide updated with EU Innovation Scoreboard 2025 data	iVita
3.0	12/01/2025	New section 2.3	iVita

A strategic guide for S3 policymakers: an in-depth comparative analysis of cluster policies in Bulgaria, Lithuania, and Greece

1. Introduction: The European Framework for Cluster Policy and Smart Specialisation

For Less Developed Regions (LDRs) seeking to bridge the innovation divide and enhance economic cohesion, the formulation and execution of an effective Smart Specialisation Strategy (S3) is the cornerstone of modern regional development. Clusters - geographic concentrations of interconnected companies, specialized suppliers, service providers, and associated institutions - are the primary instrument for implementing these strategies. They act as the dynamic engines that transform high-level S3 priorities into tangible economic activity by fostering collaboration, accelerating knowledge diffusion, and creating the critical mass necessary to compete on a European and global scale. According to the **"Summary report on cluster policies and programmes across Europe (2022 edition)"**, a formal cluster policy is "an expression of political commitment, composed of a set of specific government policy interventions that aim to strengthen existing clusters and/or facilitate the emergence of new ones," effectively functioning as "a framework policy that opens the way for bottom-up dynamics" (p. 37).

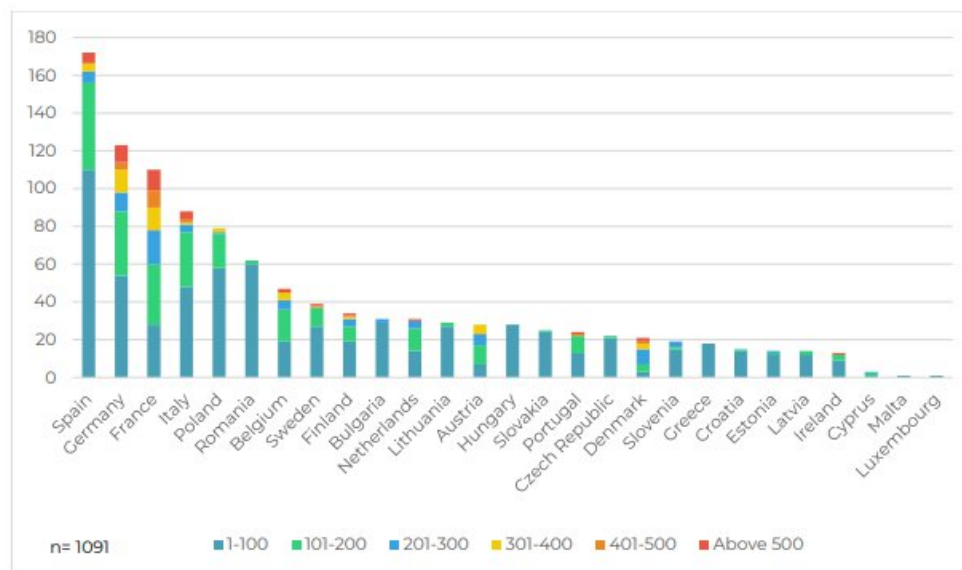


Figure 1 Cluster organisations registered on the ECCP, by EU27 Member States and size group

(Source: ECCP; Data extracted from ECCP Platform on 14/10/22; summary data provided in Table 5 (Annex), Summary report on cluster policies and programmes across Europe and priority third countries, 2022 edition)

The broader context for this strategic imperative is set by the European Semester, a framework explicitly designed, as stated in the 2024 country factsheets for Bulgaria, Lithuania, and Greece, "to ensure sustainable economic growth, job creation, macroeconomic stability, and sound public finances across the EU." This mandate has become increasingly challenging. The factsheets acknowledge that cluster policy today operates amidst "major geopolitical and transformation challenges," including the fallout from the global pandemic, Russia's war of aggression against Ukraine, a systemic energy crisis, and the imperative to master the green and digital transitions. In this environment, as the factsheets note

by citing the Draghi report, innovation is at the core of Europe's future competitiveness, and "clusters play a crucial role in organising the cooperation of key actors in industrial innovation ecosystems to create the solutions that Europe needs."

EU27 COUNTRY	Large firms		SMEs		Research Organisations		Total #
	#	%	#	%	#	%	
Austria	821	17%	3,584	74%	425	9%	4,830
Belgium	978	14%	5,360	77%	615	9%	6,953
Bulgaria	137	11%	1,004	79%	126	10%	1,267
Croatia	74	13%	416	70%	101	17%	591
Cyprus	10	2%	496	92%	31	6%	537
Czechia	150	18%	601	72%	89	11%	840
Denmark	598	12%	4,205	84%	217	4%	5,020
Estonia	41	6%	612	88%	43	6%	696
Finland	310	10%	2,384	80%	287	10%	2,981
France	3,195	14%	17,427	74%	2,902	12%	23,524
Germany	2,274	4%	50,985	91%	2,585	5%	55,844
Greece	77	11%	497	71%	125	18%	699
Hungary	47	5%	819	87%	77	8%	943
Ireland	297	24%	834	67%	116	9%	1,247
Italy	1,050	7%	13,537	87%	1,058	7%	15,645
Latvia	84	9%	766	85%	54	6%	904
Lithuania	84	9%	720	79%	107	12%	911
Malta	0	0%	20	100%	0	0%	20
Netherlands	425	11%	3,249	83%	239	6%	3,913
Poland	615	10%	4,752	80%	552	9%	5,919
Portugal	263	9%	2,504	82%	301	10%	3,068
Romania	181	8%	1,814	78%	336	14%	2,331
Slovakia	103	14%	548	77%	62	9%	713
Slovenia	160	13%	914	71%	206	16%	1,280
Spain	2,428	12%	16,520	81%	1,351	7%	20,299
Sweden	483	13%	3,061	83%	153	4%	3,697
Total	14,885	9%	137,629	84%	12,158	7%	164,672

Source: ECCP; Data extracted from ECCP Platform on 14/10/22.

Table 1 Cluster organisations members in the EU27, by actor type and country

The importance of this approach is substantiated by empirical data. The 2022 Summary Report found that "the presence of cluster organisations is positively linked to various aspects of regional competitiveness such as employment, human resources and research and development expenditures," and is "especially linked to indicators that measure digital performance" (p. 7). This confirms that fostering clusters is a direct pathway to strengthening the innovation capacity and economic resilience of a region.

Recent results from the European Innovation Scoreboard (EIS) 2025 show that the EU's innovation performance has increased by 12.6 percentage points since 2018, but there has been almost no change

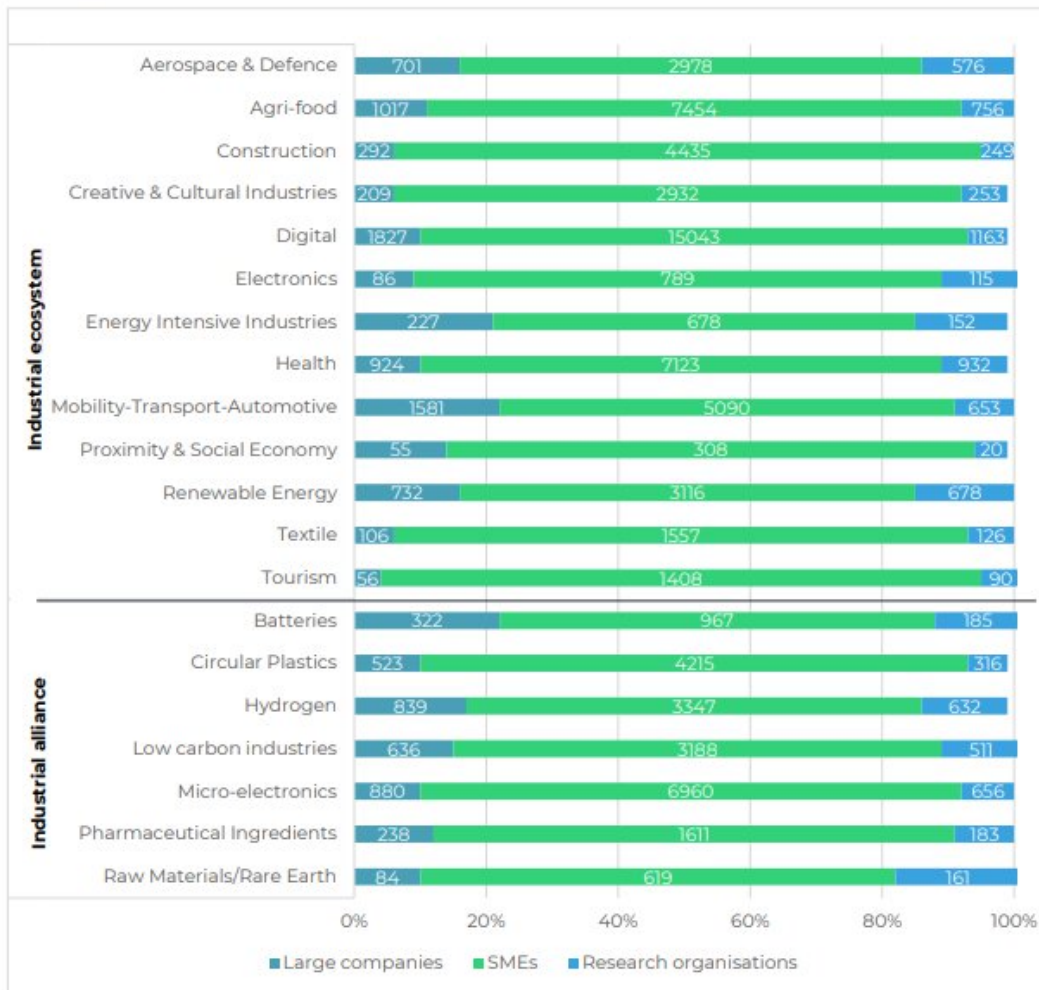
between 2024 and 2025. The EU27 is still split into four performance groups: Innovation Leaders, Strong Innovators, Moderate Innovators, and Emerging Innovators. On average, Moderate Innovators reach about 90 percent of the EU level of performance, while Emerging Innovators reach only about 57 percent, with a gap of roughly 33 percentage points between the two groups. These persistent gaps confirm that catching up is difficult even when all countries improve, and they underline the need for Smart Specialisation and cluster policies that are specifically designed to help less developed regions close these structural differences rather than only support isolated projects.

Innovation performance baseline for Bulgaria, Lithuania and Greece (EIS 2025)

The European Innovation Scoreboard 2025 classifies Lithuania and Greece as Moderate Innovators and Bulgaria as an Emerging Innovator. This means that Lithuania and Greece perform below the EU average but clearly above the Emerging Innovator group, while Bulgaria's overall performance stays well below 70 percent of the EU level.

- Lithuania - converging Moderate Innovator. Lithuania's Summary Innovation Index (SII) is 81.0 in 2025 (EU = 100), which places it 18th among EU Member States. Its score has increased by 17.4 points compared to 2018, although it has fallen by 3.5 points since 2024.
- Greece - Moderate Innovator with strong SME innovation. Greece is also a Moderate Innovator and ranks 20th among EU Member States and 24th among the EU and neighbouring countries. The scoreboard highlights Greece as the top performer in the Innovators dimension, with a score of 181.4 driven by high rates of SMEs introducing product and process innovations, but also notes weaknesses in exports of medium and high-tech products, design applications, and the share of foreign doctorate students.
- Bulgaria - improving but still Emerging Innovator. Bulgaria's SII reaches 51.6 percent of the EU average in 2025, up from 45.2 in 2018 but slightly down from 53.8 in 2024. This confirms that Bulgaria remains in the lower part of the EU ranking. At the same time, Bulgaria has made sizable gains in investments in information technologies (+48.2 points), digitalisation (+33.6 points) and resource and labour productivity (+22.2 points) since 2018, although these improvements start from low levels.

Taken together, these EIS profiles show that the three LDRs start their current S3 and cluster policy reforms from quite different positions in the European innovation hierarchy. Cluster policy in Bulgaria must work against a much weaker national innovation system, while Lithuania and Greece can build on stronger human capital and SME innovation bases, even though their overall performance still lags behind the EU average.



Source: ECCP; Data extracted from ECCP Platform on 14/10/22.; summary data provided in Table 9 (Annex 1).

Figure 2 Types of cluster organisation members by industrial ecosystem and industrial alliance, in the EU27

This imperative is clearly recognized in the core strategic documents for the 2021-2027 funding period for the three countries under review. The **ERDF Partnership Agreements** explicitly integrate clusters into their national development plans:

- In **Greece**, the agreement prioritizes "Measures to increase the average size of companies, promoting collaborations between SMEs through the creation of clusters... with the aim of facilitating their access to global markets and value chains" (Greece Factsheet, p. 5).
- In **Bulgaria**, the agreement states that "full participation of innovation clusters in the research and innovation ecosystem supports the regional economy, enterprise growth and smart specialisation" (Bulgaria Factsheet, p. 5).
- In **Lithuania**, the OP Programme for 2021-2027 explicitly "supports innovation clusters and cooperation of companies, research organisations, public authorities, and business networks, which should lead to the benefit of SMEs" (Lithuania Factsheet, p. 5).



Source: ECCP (2022).

Figure 3 Overview of the 30 Euro clusters by industrial ecosystem

To provide a rigorous, evidence-based foundation for policymakers seeking to translate these strategic goals into effective action, this guide utilizes the analytical framework established by the "**Summary report on cluster policies and programmes across Europe (2022 edition)**". This foundational document provides a standardized methodology for assessing the sophistication and effectiveness of national innovation policies through its **Policy Maturity Index**. As detailed in the report's methodology (p. 87), this index evaluates national frameworks across four decisive pillars:

1. **Policy approach:** It distinguishes between countries with a dedicated, explicit cluster policy (a sign of high maturity) versus those where cluster support is an implicit, often secondary, objective within broader strategies.
2. **Continuity:** It assesses the duration and stability of cluster-specific policies, as long-term commitment provides a predictable environment essential for private sector investment and strategic planning.
3. **Evidence of performance:** It measures the existence and rigor of systematic monitoring and evaluation mechanisms, which are fundamental for enabling evidence-based policy adjustments, ensuring public accountability, and proving return on investment.
4. **Support instruments:** It evaluates the availability of a comprehensive suite of financial and technical tools. A mature policy provides a range of instruments, from R&D grants to coaching and internationalization support, tailored to the specific needs of clusters and their SME members.

This analysis undertakes a granular, comparative examination of the cluster policies and landscapes in Bulgaria, Lithuania, and Greece. By dissecting their divergent paths—from Greece's established, dedicated approach to the more nascent, embedded strategies of Bulgaria and Lithuania—this guide aims to extract actionable, evidence-based recommendations to empower S3 policymakers across LDRs in their mission to build more resilient, innovative, and interconnected regional economies.

2. In-Depth Comparative Analysis

2.1. The Foundational difference: Policy approach and national maturity.

The most profound distinction among the three nations-and the primary determinant of their capacity to systematically foster innovation ecosystems-is the nature and formality of their governmental approach to cluster development. This is not merely a question of semantics; the choice between a dedicated, explicit policy and an implicit, embedded approach has significant, tangible consequences for funding, governance, visibility, and long-term sustainability. The **"Summary report on cluster policies and programmes across Europe (2022 edition)"** quantifies this distinction through its Policy Maturity Index, which is scored out of a maximum of 8 points. The divergence between Greece and the other two nations is stark and illustrative.

- **Greece: A Dedicated, Multi-Pronged, and Mature Strategy (Maturity Score: 5.0/8.0)**
Greece exemplifies a mature policy approach, characterized by a dedicated national cluster policy framework with a history spanning over a decade. This commitment is not a generic line-item in a broad economic plan but is operationalized through a portfolio of specific, well-funded, and targeted programs detailed extensively in the **2024 Greece Factsheet** (pp. 14-27). Key initiatives from the 2014-2020 period demonstrate a sophisticated, multi-pronged investment strategy:
 - **"Innovation Clusters (2nd Call - Businesses)"**: With a budget of **€34.68 million**, this program was designed to directly fund the R&D and innovation activities of businesses *within* clusters, addressing the core need for project financing.
 - **"Competence Centers"**: Allocated **€30 million**, this initiative focused on a different strategic goal: creating public-private partnership schemes to "bridge the gap between demand and supply of specialized innovation services and technology transfer." This program specifically targeted the creation of spinoff companies from universities and research organizations, a direct mechanism to strengthen science-business linkages.
 - **"Strengthening Value Added Chains - Clusters - Networking"**: With a budget of **€32 million**, this program aimed to bolster collaboration among SMEs along specific value chains, focusing on the nine priority areas of the National Strategic Reference Framework (NSRF), including Agri-food, Tourism, and ICT.
- This portfolio approach reveals a nuanced understanding of the different support mechanisms required at various stages of ecosystem development. The long-term, targeted, and well-resourced nature of this framework is the principal reason for Greece's relatively high **Policy Maturity Score of 5.0/8.0**. As the 2022 Summary Report notes, the existence of a dedicated national policy is the highest-scoring attribute for the "Policy Approach" dimension (p. 87), and Greece's 10+ year history likewise earns it the maximum score for "Continuity." For businesses and international partners, this policy stability provides a clear, predictable environment, reducing risk and encouraging deeper, long-term engagement in collaborative innovation.
- The EIS 2025 data are consistent with this picture. Greece is a Moderate Innovator and ranks 20th in the EU and 24th among the EU and neighbouring countries. It scores especially high in the Innovators dimension, where it is the top performer in the EU with a score of 181.4, reflecting very high shares of SMEs introducing product and process innovations. At the same time, the

country profile points to persistent weaknesses in exports of medium and high-tech products, design applications, and in the share of foreign doctorate students, showing that strong SME-level innovation does not automatically translate into high-tech export performance or an open research system.

- **Bulgaria: An Implicit Strategy Embedded in Broader National Goals (Maturity Score: 1.5/8.0)**

In stark contrast, Bulgaria lacks a stand-alone, dedicated national cluster policy. As the **2024 Bulgaria Factsheet** (pp. 13-24) clarifies, cluster support is an implicit objective embedded within overarching national strategies. The primary vehicles are the "**Innovation Strategy for Smart Specialisation (ISIS) 2021-2027**" and the "**National Development Programme Bulgaria 2030.**" The stated objectives of these programs are exceptionally broad, aiming to "position Bulgaria as a centre of medium- and high-tech innovation" and achieve "accelerated economic development." While clusters are mentioned as a tool-for instance, ISIS aims to develop firms "through existing strong clusters and their organisations"-they must compete for focus, funding, and political attention with numerous other national priorities.

This "broad policy" approach, as categorized by the 2022 Summary Report, scores only 0.5 out of a possible 2 points for the "Policy Approach" dimension. The report's data shows that this is a common characteristic for countries in earlier stages of policy development. While Bulgaria has had sporadic, project-based calls for cluster development under past Operational Programmes (2007-2022), the factsheet highlights the lack of a continuous, dedicated policy framework. This has hindered the systematic maturation of the ecosystem and is the primary reason for its low **Policy Maturity Score of 1.5/8.0**.

- Bulgaria's EIS 2025 profile illustrates the constraints faced by an LDR with an implicit cluster policy. As an **Emerging Innovator**, Bulgaria's overall innovation performance stands at **51.6 percent of the EU average** in 2025, up from **45.2** in 2018 and slightly below its **2024** peak of **53.8**. The country shows some of the largest improvements among **Emerging Innovators** in **investments in information technologies** (+48.2 points), **digitalisation** (+33.6 points) and **resource and labour productivity** (+22.2 points) since 2018. However, Bulgaria remains in the bottom group in the **Finance and support** dimension together with Latvia and Romania, and in the lower part of the ranking for **Firm investments**, confirming that both public and private funding for innovation are still weak.

- **Lithuania: A Nascent and largely conceptual approach (Maturity Score: 1.0/8.0)**

Lithuania's approach is the most nascent of the three, placing it at the earliest stage of policy development. Similar to Bulgaria, it operates without a dedicated national cluster policy, with support mechanisms contained within the broad "**Programme for the European Union funds' investments in 2021-2027**" (Lithuania Factsheet, pp. 13-17). A critical insight from the **2024 Lithuania Factsheet** (p. 20) is the status of the "**Concept of Lithuanian Cluster Development**" (revised in 2020). The report explicitly and critically states that this document, despite its promising title, "**does not provide any concrete policy interventions.**"

This finding signifies a fundamental gap between strategic recognition and practical implementation. The Lithuanian government acknowledges the importance of clusters conceptually, but this has not yet been translated into a coherent, actionable policy architecture with dedicated instruments, governance, and funding lines. This purely conceptual stage of

policy development is the direct cause of its **Policy Maturity Score of 1.0/8.0**, the lowest of the trio. The scoring reflects the "broad policy" approach (0.5/2) and the "no cluster-specific policy available" status for the "Continuity" dimension (0/2), as per the 2022 Summary Report's methodology. This represents a significant opportunity for policy learning and development.

- Lithuania's EIS 2025 data confirm this picture of a conceptually advanced but operationally weak cluster framework. Lithuania is a Moderate Innovator with an SII of 81.0 (EU = 100), ranked 18th among EU Member States. Since 2018 its score has grown by 17.4 points, but it has declined by 3.5 points compared to 2024. The country shows strong results in tertiary education (index 179.7, 4th in the EU) and non-R&D innovation expenditures (index 156.9, 2nd in the EU), and scores above the EU average in venture capital expenditures and digitalisation. At the same time, business R&D expenditures (index 26.9, rank 23) and direct and indirect government support for business R&D (index 29.9, rank 20) remain clear weaknesses. This combination suggests that Lithuania has a well-educated workforce and some capacity for non-technological innovation, but lacks a strong pipeline of R&D-intensive firms, which makes the absence of a concrete cluster policy architecture particularly problematic.

2.2. Cluster landscape: Scale, composition, and the capital-centric innovation trap.

Across the EU remote care and RPM landscape, clusters function as the "connective tissue" between research, clinical practice, startups, corporates, and policy instruments. They accelerate knowledge transfer, provide shared infrastructure for piloting and validation, and lower barriers to market entry by bundling regulatory, business, and internationalisation support. In the context of remote care, clusters also help align innovation supply (technology developers) with demand-side realities (healthcare providers, payers, and public systems), creating pathways from experimentation to adoption.



Source: ECCP (2022).

Figure 4 Overview of the EU cluster support initiatives in the 2014-2020 and 2021-2027 funding period

Scale and density. The mapping indicates that cluster scale varies widely across Europe. In higher-maturity innovation environments, cluster ecosystems tend to be larger, more specialised, and more strongly embedded in national and regional smart specialisation strategies. These ecosystems typically include multiple interlinked clusters (e.g., MedTech, digital health, AI, life sciences) and a broad base of member organisations. In less mature environments, remote care-relevant clusters are fewer, smaller, and often operate with limited staffing and project pipelines. As a result, they play more of a networking and awareness role than a scaling role. This uneven scale contributes to differences in how quickly RPM innovations move from pilots to routine care.

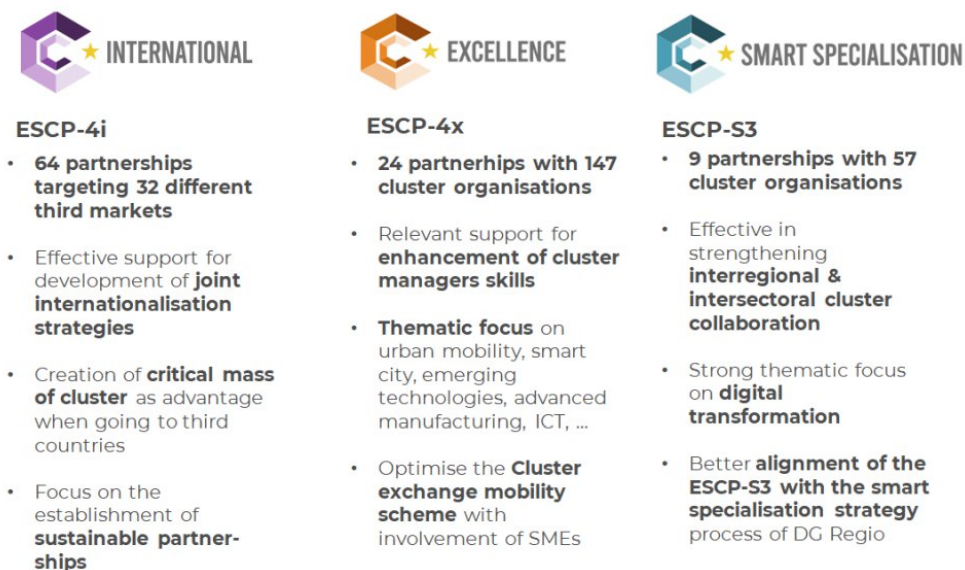
Composition and specialisation. Cluster composition is also uneven. Some ecosystems show strong balance across the "quadruple helix" (academia, industry, public sector, and civil society), enabling co-creation and early real-world validation. In other contexts, membership skews heavily toward one helix—often industry or academia—leading either to technology-push innovations without strong

clinical anchoring, or to research excellence with weak commercial follow-through. For remote care specifically, cluster effectiveness increases when healthcare providers and payers are meaningful, active members rather than peripheral stakeholders. Clusters that integrate hospitals, primary care networks, patient organisations, and insurers tend to generate solutions that fit workflows, reimbursement logic, and interoperability needs from the start.

Capital-centric innovation trap. A recurring structural challenge is the concentration of cluster activity in capital cities and major metropolitan hubs. Capital regions usually host the strongest universities, tertiary hospitals, venture capital, and public innovation agencies, so clusters naturally form and grow there. However, this creates a “capital-centric innovation trap”:

1. innovation capacity accumulates in the capital;
2. pilots are mostly urban and hospital-based;
3. scaling frameworks become tailored to metropolitan infrastructure and digital readiness;
4. peripheral regions stay under-served and under-connected, thereby attracting fewer projects and less investment.

For RPM, this trap is particularly risky because the societal value of remote care is highest in rural, ageing, and access-constrained areas. If clusters remain metro-centric, remote care may unintentionally reinforce health inequities instead of reducing them. The innovation pipeline then becomes biased toward urban use cases, digitally literate populations, and high-resource providers, leaving smaller hospitals and primary care networks outside the learning loop.



Source: ECCP (2022) based on the Evaluation Study of and Potential Follow-Up to Cluster Initiatives under COSME, H2020 and FPI (2021).

Figure 5 Key findings from the evaluation study (2021) for the ESCPs

Implications for IRHIS and remote care scaling. To enable equitable scale-up of RPM across diverse EU regions, cluster ecosystems need to evolve in two directions. First, they should deepen health-sector specialisation - moving beyond generic “innovation cluster” structures toward clear HealthTech / Digital Health / MedTech cluster mandates that can steward clinical validation, regulatory navigation, and reimbursement dialogue. Second, they must extend their operational reach beyond capitals by building strong regional nodes, satellite partnerships, or formal cross-regional alliances. In practice, this means supporting pilots in non-metropolitan settings, embedding regional healthcare providers into clustering activities, and ensuring that cluster services (regulatory support, procurement know-how, interoperability expertise, and investment readiness) are accessible across the whole territory.

In short, clusters are indispensable enablers of remote care innovation in Europe. But without sufficient scale, balanced composition, and deliberate de-centralisation, they risk remaining excellent networking structures that do not fully translate remote care promise into system-wide, equitable impact.

Number and scale of organizations: a landscape of nascent networks

The number of cluster organizations formally profiled on the European Cluster Collaboration Platform (ECCP) provides a baseline for understanding the breadth of the ecosystem. The **2024 factsheets** report broadly comparable numbers: **Bulgaria leads with 34, followed by Lithuania with 31, and Greece with 20.** A far more telling characteristic, however, is the scale of these organizations. The "**Summary report on cluster policies and programmes across Europe (2022 edition)**" provides granular data on this, revealing a landscape dominated by small-scale entities. For instance, the report's data (Table 5, p. 67) shows the percentage of clusters with 1-100 members:

- **Greece:** 100% of its profiled clusters (18 out of 18 at the time) were in this smallest size category.
- **Bulgaria:** 94% (29 out of 31) were in this category.
- **Lithuania:** 93% (27 out of 29) were in this category.

This phenomenon, which can be termed the "capital-centric innovation trap" represents a formidable barrier to achieving the S3 goal of balanced, place-based regional development. It indicates that the key ingredients for innovation-access to finance, a critical mass of skilled labor, top-tier research institutions, and entrepreneurial networks-are coalescing in one dominant metropolitan area. This creates a self-reinforcing cycle that can widen the economic and innovation gap between the capital and the rest of the country, undermining the very principle of smart specialisation, which is to build on the unique, latent strengths of *all* regions, not just the most developed one. S3 policy must therefore include specific, powerful incentives and support mechanisms to encourage the formation and growth of clusters in non-capital regions.

- **Membership composition and science-business linkages: measuring the triple helix**

The composition of cluster membership provides a direct window into the functionality of the "Triple Helix" innovation model-the collaborative links between industry, academia, and government. All three countries show a healthy dominance of SMEs, which is the intended target for much of cluster policy. However, a nuanced examination of the formal participation of research organizations reveals different levels of maturity in forging the critical links between knowledge creation and its commercial application.

- **SME dominance:** As the core of the economy, SMEs represent the largest membership bloc, according to the 2024 factsheets: **Bulgaria (80%), Lithuania (76%), and Greece (72%).** These figures align closely with the EU average (83%), confirming that the clusters are correctly targeting the SME sector.
- **Research organization integration: A Key Differentiator:** Greece stands out as a positive model in this respect. Its 2024 factsheet reports that **17% of its cluster members are research organizations.** This is a substantially higher rate of academic integration than is found in **Lithuania (12%) and Bulgaria (11%).** This data point is more than a simple statistic; it is a direct indicator of a more integrated and functional innovation ecosystem. It suggests that Greece's dedicated policy framework, with initiatives like the "Competence Centers" specifically designed to create university spinoffs, has been more effective at creating the formal, structural linkages between academia and industry that are essential

for high-level technology transfer, applied R&D, and the development of a knowledge-based workforce. For policymakers in Bulgaria and Lithuania, this highlights a specific area where targeted policy interventions could yield significant improvements in the innovative capacity of their clusters.

2.3. A deeper dive: health and remote care cluster ecosystems in Bulgaria, Lithuania and Greece: insights from IRHIS D1.1 “Mapping of remote care innovation”

Complementing the cross-country picture above, evidence from the IRHIS D1.1 “Mapping of Remote Care Innovation - Recommendations to Stakeholders” provides a health-sector-specific view on how clusters and related ecosystem organisations operate in Bulgaria, Lithuania and Greece. The deliverable combines extensive desk research with 22 semi-structured interviews with MedTech SMEs, health and digital clusters, healthcare providers, government bodies and academia across the seven participating countries, including our three LDRs. This yields a granular picture of how remote care and RPM are emerging within national S3 priorities, which actors drive innovation, and which bottlenecks prevent scaling.

For S3 policymakers, a key insight is that in all three countries, remote care and wider digital health activity is concentrated in a small set of health- or digital-health-oriented clusters, science and technology parks and digital innovation hubs. Even when these organisations are not explicitly labelled as “health clusters” in national policy, they already function as proto-health-innovation clusters: aggregating SMEs, research institutions and healthcare providers around remote care use cases, and channelling EU and national project funding into pilots and early deployments.

Bulgaria - early pilots and fragmented cluster roles in remote care.

D1.1 shows that Bulgaria’s remote care landscape is still formative but gaining momentum. The national S3 framework, notably the priority area “Industry for a healthy lifestyle, bioeconomy and biotechnologies”, explicitly recognises digital health and personalised medicine as growth domains. Remote monitoring pilots in cardiology, diabetes, post-surgical follow-up and elderly care are typically driven by private providers, start-ups and research groups working with hospitals and municipalities, often through project-based consortia that resemble clusters even if they are not fully institutionalised. At system level, the National Health Information System (NHIS) forms the backbone for e-prescriptions and health-data exchange, but integration of RPM platforms, wearables and home-based diagnostics into this infrastructure is still limited.

Experts describe a landscape dominated by pilots with little scale-up, due to the absence of a clear legal definition for telemedicine and RPM, lack of certification and registration pathways, no reimbursement codes in the National Health Insurance Fund, and weak interoperability standards for connecting third-party platforms to the NHIS. Under these conditions, health-oriented clusters and digital innovation hubs can help launch pilots and broker partnerships, but they operate in a regulatory and financial grey zone that makes sustained scaling difficult. For S3, this implies that cluster policy in Bulgaria needs to be tightly coupled with reforms in health regulation, reimbursement and data infrastructure if remote care is to move beyond small-scale experiments.

Lithuania - a dynamic health innovation base with emerging remote care clusters.

Lithuania’s RIS3 for 2021-2027 prioritises health technologies, biotechnologies and safe food, and the D1.1 country profile confirms that this priority has translated into a relatively dense network of universities, research institutes, science and technology parks and specialised health-innovation

clusters. Remote care innovation is concentrated around HealthTech/MedTech actors developing connected devices for chronic disease management, post-discharge monitoring solutions, telemedicine platforms and early AI-assisted diagnostics.

Health focused clusters such as the Health Technology Cluster iVita, Baltic Health Cluster and the LithuaniaBio association, alongside innovation intermediaries like Innovation Agency Lithuania and Kaunas Science and Technology Park, already act as conveners between SMEs, clinical partners and ministries, helping to align projects with S3 priorities. At the same time, experts point to persistent barriers that limit the ability of these clusters to drive system-wide scale-up: regulatory uncertainty around RPM, fragmented data infrastructure and interoperability, uneven access to funding, and a shortage of specialist skills in digital health, bioinformatics and regulatory affairs. These constraints mean that, despite strong innovation potential, remote care projects remain scattered and often struggle to move beyond pilot or early commercialisation stages-reinforcing the need for a clearer national cluster strategy and health-innovation-oriented S3 instruments.

Greece - specialised digital health clusters with strong innovation but constrained scaling.

Greece's national RIS3 recognises "Biosciences, Health and Pharmaceuticals" as one of its core priority areas and explicitly highlights remote care (telemedicine and home care for chronic and elderly patients) as a key innovation field. The S3 and Recovery and Resilience Facility (RRF) together support investments in digital health technologies, EHR integration and teleconsultation services, including in less developed regions such as Kentriki Makedonia, Thessalia and Crete. At regional level, the Hellenic Digital Health Cluster (HDHC) and related life-science clusters bring together medtech SMEs, digital health start-ups, hospitals and research centres, and already function as specialised health-innovation hubs within the broader Greek cluster landscape.

The D1.1 mapping shows that Greek remote care companies have developed technically mature, modular platforms with continuous data flows, AI-supported decision-support tools and municipal RPM hubs in remote areas, yet their uptake remains constrained by a lack of clear reimbursement rules, complex certification requirements and limited venture-capital depth. Clinician resistance and uneven digital literacy add further friction, while fragmented interoperability between devices, platforms and national EHR initiatives raises operational costs. Experts therefore call for national-level policy support, especially a reimbursement framework, professional training programmes and strong public-private partnerships, to fully leverage these health clusters as engines for remote care scaling.

Across all three LDRs, the IRHIS evidence confirms that health sector clusters, digital innovation hubs and science/technology parks are already central nodes in the remote care ecosystem: they broker partnerships between SMEs and hospitals, channel EU and national project funding and provide platforms for experimentation. However, their ability to convert pilots into sustainable, territorially balanced services is heavily conditioned by higher level S3, health policy and reimbursement frameworks. Without clearer regulation, standardised data infrastructure and targeted adoption funding, even the most dynamic health clusters risk remaining small, metro-centric islands of innovation rather than the backbone of inclusive remote care systems. This makes it essential that S3 cluster policies in LDRs are designed with explicit reference to the needs and bottlenecks identified in the IRHIS D1.1 mapping.

What the IRHIS mapping means for health and remote care clusters in LDRs

The IRHIS D1.1 "Mapping of remote care innovation" confirms that remote patient monitoring (RPM) and telehealth are emerging across seven EU countries, but with stark maturity gaps between frontrunners such as Belgium and the Netherlands and LDRs such as Bulgaria and Lithuania. While

pilots, academic innovations and PPPs are visible in all three focus countries (BG, LT, GR), their health and digital-health clusters still operate in systems constrained by fragmented regulation, unclear or absent reimbursement for RPM services, weak interoperability and cybersecurity frameworks, uneven digital infrastructure, and limited digital skills in the health workforce. At the same time, these clusters act as critical brokers for co-creation and scale-up, provided key enabling conditions are put in place. The cross-country evidence highlights eight priorities for policymakers:

- align national rules with EU frameworks and formally recognise telemedicine/RPM;
- institutionalise sustainable reimbursement models;
- strengthen standards-based data infrastructure and security;
- invest in digital skills and updated curricula;
- support innovation with structured, blended funding and innovation-friendly procurement;
- foster ecosystem collaboration through hubs and test-beds;
- embed user-centred design and real-world evidence;
- and establish monitoring bodies that track RPM adoption and feed continuous policy learning.

2.4. Strategic alignment

A core principle of Smart Specialisation (S3) is that regions should concentrate their resources on a limited number of priority areas where they have a demonstrable competitive advantage or the potential to build one. A critical analysis of the sectoral focus of existing cluster organizations versus the primary drivers of national employment in Bulgaria, Lithuania, and Greece reveals a stark and consistent disconnect. This "S3 Mismatch" shows that organic cluster formation is not necessarily occurring in the sectors of traditional economic strength, presenting a fundamental strategic dilemma that policymakers must urgently address.

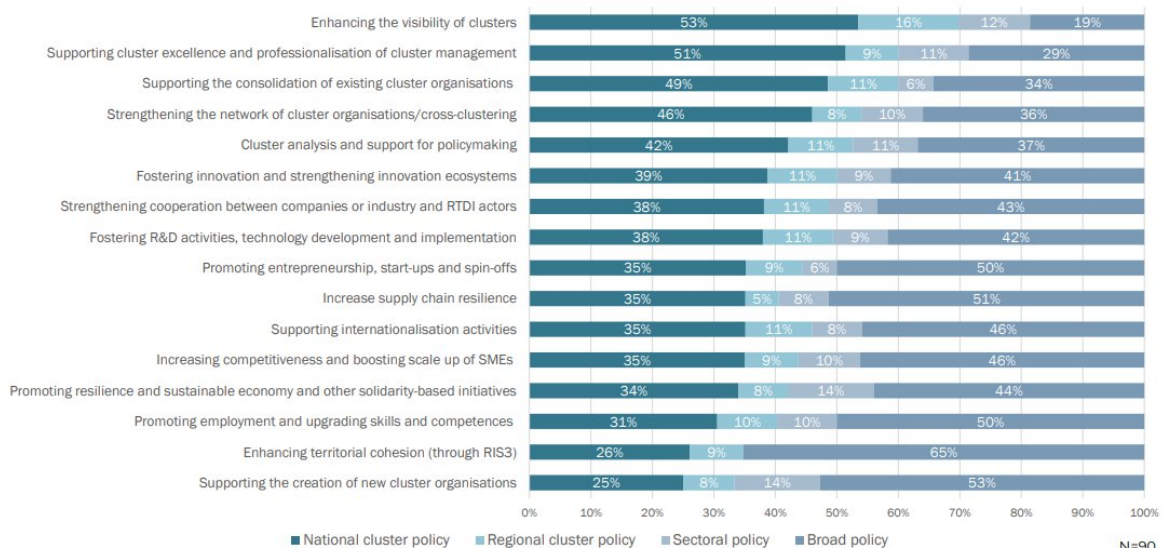


Figure 6 Policy objectives per policy type

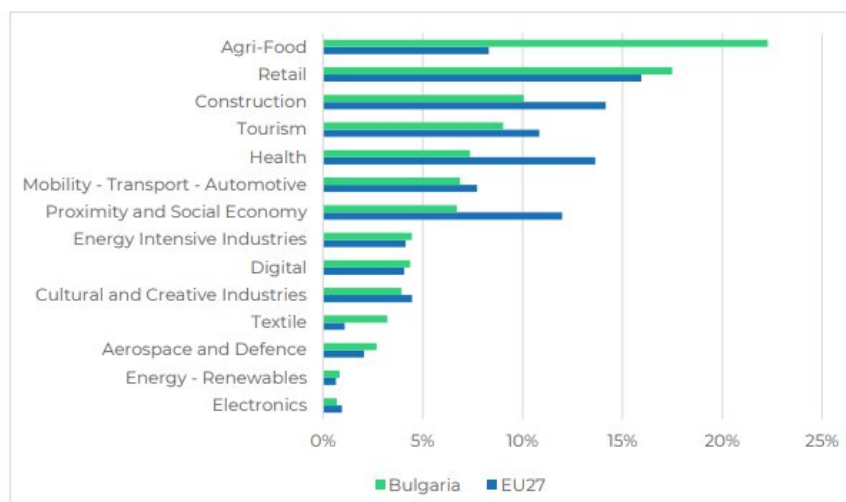
The EIS 2025 **Trade impacts** dimension strengthens this diagnosis of an S3 mismatch between cluster portfolios and economic outcomes. Greece and Lithuania are both in the **bottom five EU performers** for Trade impacts, together with Cyprus, Croatia and Latvia. All Member States except Germany score **below the EU average** in this dimension, which combines exports of medium and high-tech products, knowledge-intensive services exports and high-tech imports from outside the EU. This shows that, despite a strong cluster presence in globally traded, high-technology sectors, neither Greece nor

Lithuania have yet converted these ecosystems into strong export performance. The scoreboard therefore confirms that the current cluster portfolios are positioned in sectors with high export potential, but the expected integration into global value chains is still weak.

- **The empirical evidence of the mismatch**

The **2024 country factsheets** provide clear, quantitative data on this phenomenon by comparing employment shares across the 14 EU industrial ecosystems with the sectoral distribution of ECCP-profiled clusters.

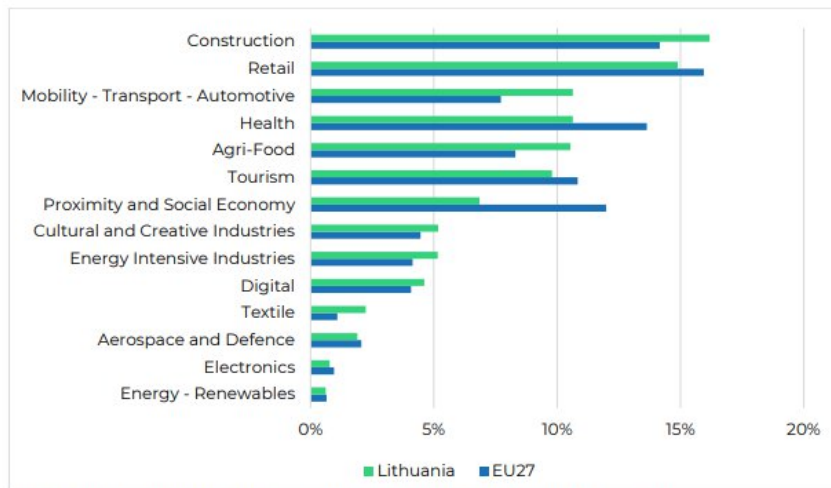
- **Bulgaria:** The economic backbone of the country, in terms of jobs, is the **Agri-Food ecosystem**, which accounts for a massive **22%** of the industrial ecosystem workforce-far exceeding the EU27 average of 8% (Bulgaria Factsheet, p. 7). This signifies a clear national specialization. However, the factsheet's analysis of the cluster landscape (p. 11) shows a dramatic divergence: the most numerous clusters are concentrated in knowledge-intensive, "frontier" sectors like **Digital (11 clusters)**, **Renewable Energy (5)**, and **Creative & Cultural Industries (5)**. The economically massive Agri-Food sector is represented by just **2 clusters**. This indicates that while the bulk of the workforce is in a traditional sector, the most dynamic collaborative innovation is happening elsewhere.



Source: ECCP (2025), own elaboration based on the latest Eurostat data for 2022.

Figure 7 Bulgaria's ecosystem

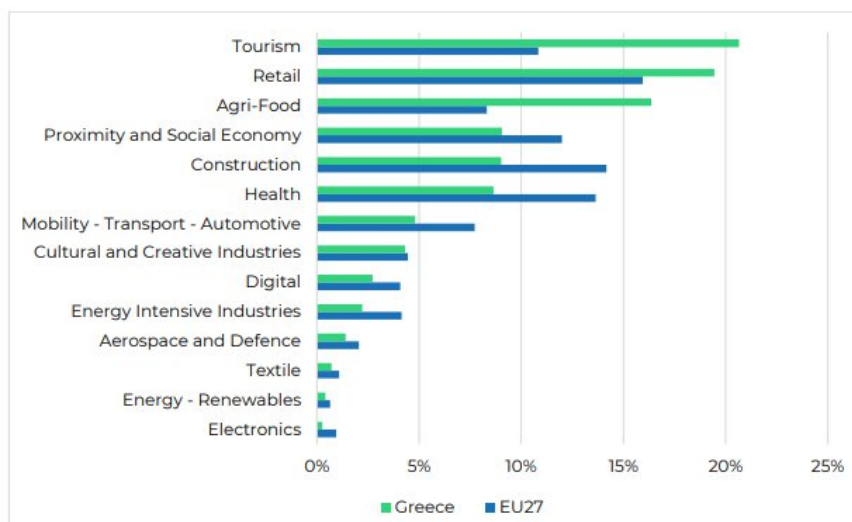
- **Lithuania:** A similar pattern emerges. The country's largest employment ecosystems are in traditional and non-traded sectors: **Construction, Retail, and Mobility-Transport-Automotive** (Lithuania Factsheet, p. 7). Yet, its cluster landscape, as detailed on page 10 of the factsheet, is overwhelmingly dominated by high-technology and R&D-intensive fields: **Digital (9 clusters)** and **Health (8 clusters)**. There is virtually no formal cluster representation in the country's largest employment sectors, highlighting a significant gap between the established economy and the emerging innovation ecosystem.



Source: ECCP (2025), own elaboration based on the latest Eurostat data for 2022.

Figure 8 Lithuania's employment ecosystems

- **Greece:** The mismatch here is perhaps the most pronounced. The twin pillars of the Greek economy, **Tourism and Retail**, are dominant employers, collectively accounting for approximately **40%** of the industrial ecosystem employment, with Tourism's share being vastly larger than the EU27 average (Greece Factsheet, p. 8). In a stark contrast, the factsheet's cluster analysis (p. 12) reveals that these vital sectors have almost no formal cluster representation (**1 cluster in Agri-Food, none in Tourism or Retail**). Instead, the landscape is led by **Digital (8 clusters), with Energy Renewables, Construction, Health, and Aerospace & Defence** following.



Source: ECCP (2025), own elaboration based on the latest Eurostat data for 2022.

Figure 9 Greece employment ecosystems

- **The strategic crossroads for S3 policy**

This consistent pattern is not a sign of policy failure but rather a critical strategic crossroads that must be navigated with deliberate S3 policy choices. The data suggests that organic cluster formation, likely driven by entrepreneurs, researchers, and venture capital, is naturally gravitating towards emerging, high-technology, and globally-traded sectors. The traditional

sectors, while providing the bulk of current employment, appear to be less engaged in this form of collaborative innovation.

- This presents policymakers in LDRs with a fundamental S3 dilemma that requires a clear and conscious strategic decision:
 1. **Strategy A: Reinforce the Frontier.** Should policy primarily focus on reinforcing and scaling these nascent high-tech clusters? This approach would be a long-term bet on economic transformation and diversification, aiming to build the high-value industries of the future. The risk is that these sectors may take a long time to generate mass employment, potentially leaving the traditional economic base to stagnate.
 2. **Strategy B: Modernize the Backbone.** Alternatively, should policy actively intervene to create and support "modernization" clusters in the traditional sectors of strength? This approach would focus on driving technology adoption, digitalization, and sustainability within Agri-Food, Tourism, Health and Construction to protect and enhance the current employment base, increase its value-added, and improve its global competitiveness. The risk here is that it may divert resources from potentially higher-growth "frontier" sectors.
- The country profiles also reveal different starting points for S3 choices. In Lithuania, very high tertiary education attainment (index **179.7**, rank 4) and strong **non-R&D innovation expenditures** (index **156.9**, rank 2) suggest a broad base of skilled labour and capacity for organisational and marketing innovation, even if **business R&D** (index 26.9, rank 23) and direct and **indirect government support for business R&D** (index 29.9, rank 20) remain weak. In Greece, the top score in the Innovators dimension (index 181.4) indicates that many SMEs already introduce new products and processes, but weaknesses in exports of medium and high-tech products, design applications and in the share of foreign doctorate students limit their ability to compete in global markets and connect to international knowledge flows. Bulgaria, as an Emerging Innovator, remains below the EU average across most dimensions, but stands out among its peer group for relatively stronger intellectual assets and for rapid improvements in digitalisation and resource and labour productivity, even as non-R&D innovation expenditures decline. These profiles suggest that the S3 mismatch is not only sectoral but also about the type of innovation (R&D-based, non-R&D, design-based, export-oriented) that clusters and firms are currently able to deliver.
- An effective S3 will likely require a balanced, dual-pronged approach, but the crucial first step for policymakers is to explicitly acknowledge this mismatch and make a conscious, evidence-based decision on how to allocate resources between these two strategic imperatives. Ignoring this disconnect risks creating an S3 on paper that is detached from the reality of how the nation's innovation ecosystem is actually evolving.

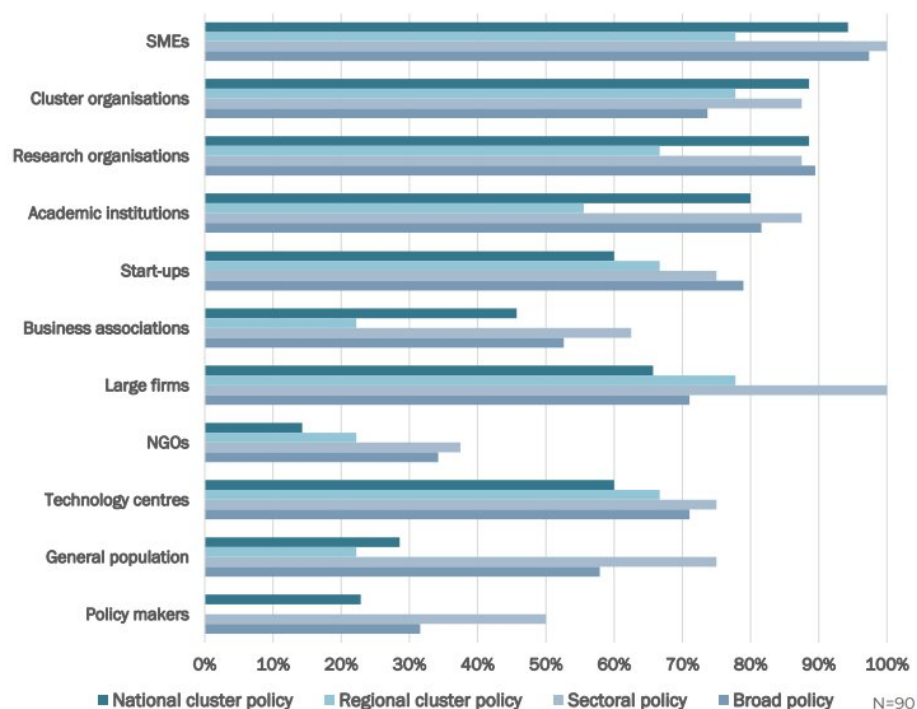
2.5. Policy effectiveness: support instruments and the pervasive evaluation deficit.

The capacity of a government to translate a policy strategy into tangible economic results depends on two critical factors: first, the availability of appropriate and well-designed support instruments, and second, the ability to measure the impact of these instruments through robust evaluation. The analysis of Bulgaria, Lithuania, and Greece reveals that while a range of support instruments exists, the near-total absence of systematic performance evaluation is the Achilles' heel of their policy frameworks, severely limiting their ability to learn, adapt, and demonstrate a return on public investment.

- **Availability of support instruments: a matter of targeting and accessibility**

All three countries provide a suite of financial and technical support instruments, as detailed in their **2024 factsheets**. However, the nature and accessibility of these instruments are directly influenced by the maturity of their policy approach.

- **Greece:** Its dedicated policy framework allows for a highly targeted menu of support. The factsheet (pp. 22-24) specifies that the "Innovation Clusters" initiative provided funding for a large variety of activities, including "prototyping, training, participation in joint exhibitions, and displaying products," as well as "funding for personnel as well as infrastructure facilities." The "Competence Centers" initiative funded the "joint use of facilities and equipment, exchange of knowledge and expertise, networking, information dissemination and collaboration." This demonstrates a comprehensive package of instruments designed to address the specific operational and strategic needs of cluster organizations and their members.
- **Bulgaria and Lithuania:** In contrast, their "broad policy" approaches mean that support instruments are often more generic and less tailored. The **Bulgaria factsheet** (p. 19-21) lists a range of available tools under its ISIS and SME strategies, including "Funding collaboration initiatives," "Support to R&D projects," and "Innovation: voucher, support to hire PhDs." Similarly, the **Lithuania factsheet** (p. 15) notes that its EU Funds Programme provides "investments and grants" and technical assistance for "hard skill development: knowledge transfer, intellectual property, entrepreneurship, export advice." While these instruments are valuable, they are part of a much larger policy landscape. For a specific cluster organization, navigating the bureaucracy of a broad national program to find and secure the right type of support can be significantly more challenging than applying to a dedicated cluster fund.



Source: ECCP (2022), based on information gathered through desk research and validation by National Authorities. N=90

Figure 10 Beneficiaries per policy type

- **The critical evaluation deficit: a barrier to evidence-based policymaking**

The most severe and universal weakness identified across all three nations is the lack of systematic, ongoing monitoring and evaluation of their cluster support activities. This is not a minor administrative oversight; it is a fundamental flaw in the policy cycle that prevents learning, adaptation, and accountability.

- The **2024 factsheets for Greece and Lithuania** are unequivocal and damning in their findings. For all major cluster-supporting programs, the assessment under the "POLICY EVALUATION" section is the same: **"No policy evaluation has been identified"** or **"No data available"** (Greece Factsheet, p. 27; Lithuania Factsheet, p. 17). This means there is no formal, publicly available evidence to determine whether the tens of millions of euros invested in these programs have achieved their stated objectives.
- **Bulgaria's** situation is equally concerning and perhaps more illustrative of the potential consequences. The factsheet (p. 27) notes that an interim evaluation of a *past* strategy (the National Regional Development Strategy 2005-2015) identified critical failures, finding a significant **"lack of alignment between the strategy and the operational programmes"** which resulted in only 6% of the budgeted funds for regional competitiveness being paid out. This historical example demonstrates the tangible negative impact of not monitoring implementation. Despite this clear lesson, the factsheet reports that for the current strategies, there is no ongoing evaluation system in place. While it notes that an interim monitoring report for the ISIS is planned for 2025, a continuous, real-time performance feedback loop is absent.

The EIS 2025 **Finance and support** and **Firm investments** dimensions provide a quantitative backdrop to this evaluation deficit. In Finance and support, which covers public R&D funding, tax support and venture capital, Bulgaria, Latvia and Romania form the **bottom of the EU ranking**, all well below the EU average. The EU average in this dimension declined by **4.4 points** between 2024 and 2025, with performance improving in only eight Member States; Bulgaria is one of the few countries with a modest increase (+4 points). In **Firm investments**, which measures business R&D and other innovation expenditures, Bulgaria, Latvia and Romania again sit near the bottom of the ranking, and 17 Member States have lower scores than in 2018. These data confirm that LDRs are trying to build effective cluster policies in an environment where both public and private innovation funding are structurally weak and in some cases declining, which makes systematic monitoring and evidence-based targeting even more critical.

This pervasive "evaluation deficit" means that policymakers in all three countries are essentially "flying blind." They lack the empirical data needed to answer fundamental questions: Which clusters are performing well and why? Which support instruments (e.g., R&D grants, training subsidies, networking support) deliver the best return on investment? How should scarce public resources be reallocated to maximize economic impact? Without a robust M&E framework, S3 becomes a static plan rather than a dynamic, learning process, and it becomes nearly impossible to justify continued public expenditure to stakeholders and taxpayers.

2.6. Interregional collaboration and integration into European value chains.

A central objective of EU cohesion and innovation policy, as operationalized through programs like the Interregional Innovation Investments (I3) instrument, is to facilitate the deeper integration of SMEs from Less Developed Regions (LDRs) into pan-European value chains. The ability of a country's clusters to

participate in and lead competitive, collaborative EU-funded projects, such as the Joint Cluster Initiatives (Euroclusters), serves as a direct and powerful indicator of their maturity, management capacity, and international connectivity. The analysis of the three countries reveals a clear correlation between the maturity of a nation's domestic cluster policy and its success on the European stage.

The Trade impacts and structural indicators in EIS 2025 underline why interregional collaboration and EU value-chain integration matter so much for LDRs. As noted above, Greece and Lithuania are both in the **bottom five EU performers** in the Trade impacts dimension, and all Member States except Germany fall below the EU average. The structural analysis of high-tech imports shows that several Member States, including Greece and Czechia, have a **high concentration of high-tech imports from a small set of supplier countries**, with China representing around three quarters of Greece's high-tech imports. For LDRs this combination of weak high-tech exports and concentrated import dependence means that cluster-based participation in EU value chains is not only a growth opportunity but also a resilience measure, helping to diversify partners and build domestic capabilities in critical technologies.

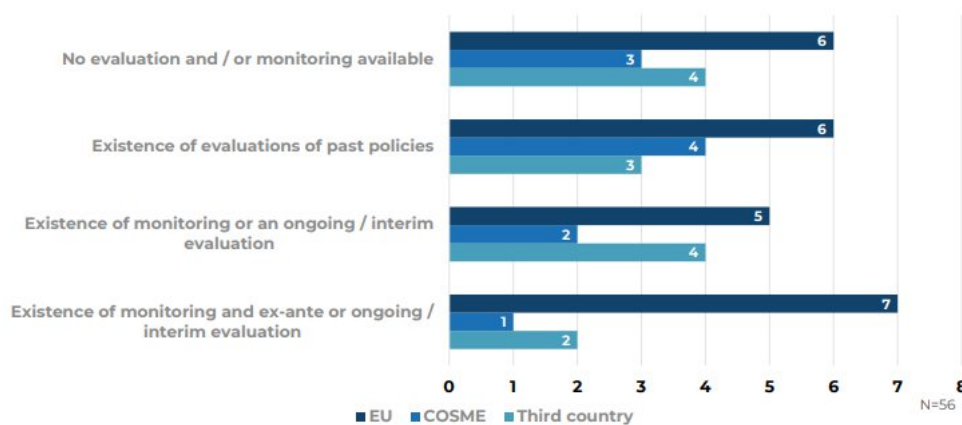


Figure 11 Evidence of performance by country type

- Greece: the mature collaborator and regional leader.** Greece's performance in interregional collaboration clearly positions it as the most mature and internationally connected of the three nations. The **2024 Greece Factsheet** (p. 12) provides precise data on this leadership: **8 Greek cluster organisations are part of 8 distinct Euroclusters**. These are not concentrated in a single sector but span a wide range of strategic ecosystems, including Tourism (EU Rural Tourism), Digital (SUSTAIN), Agri-Food (B-Resilient), and advanced manufacturing sectors like Aerospace & Defence (METASTARS) and Textiles/Construction (XBuild-EU).
- This superior performance is not accidental; it is very likely a direct dividend of its mature and dedicated domestic policy framework. As the **"Summary report on cluster policies and programmes across Europe (2022 edition)"** notes, one of the key objectives of cluster policies is "supporting internationalisation activities" (p. 39). Greece's long-standing policy has likely fostered a generation of more professional and capable cluster management organizations. These organizations possess the requisite skills in strategic planning, international networking, consortium building, and the complex administration of EU grants-capacities that are essential for successfully competing for and managing transnational

projects. This established capacity makes Greek clusters more attractive and reliable partners for consortia across Europe, creating a virtuous cycle of international engagement.

- **Bulgaria and Lithuania: emerging participants with demonstrated potential**

Bulgaria and Lithuania show a similar, emerging capacity for interregional collaboration, demonstrating a solid foundation upon which future S3 policy can build. The **2024 factsheets** for both countries report that each has **3 cluster organisations participating in 3 different Euroclusters**.

- The **Lithuania factsheet** (p. 11) provides specific examples of its engagement in high-value, strategic projects: **CREATHRIV-EU (Cultural and Creative Industries)**, **EPICENTRE (covering Digital, Agri-Food, and Health)**, and **SUAVE (Agri-Food)**. This demonstrates that Lithuanian clusters, while fewer in number at the EU level, are successfully engaging in diverse and technologically advanced European networks.
- Similarly, the **Bulgaria factsheet** (p. 11) highlights its participation in key technology-focused Euroclusters: **AEC Eurocluster (Construction)**, **RE-CENTRE (Digital and Creative Industries)**, and **Silicon Eurocluster (Electronics)**. This engagement in strategic areas like electronics and digital transformation is a positive sign of the country's ambition to connect with high-growth European value chains.

- However, the fact that their overall participation rate (3 clusters each) is significantly lower than Greece's (8 clusters) is a critical data point for policymakers. It suggests that while pockets of excellence and international capacity exist, the ecosystem as a whole may lack the depth, experience, or systematic support needed to compete at the EU level consistently. The **2022 Summary Report** (p. 32) shows that participation in past EU cluster initiatives was heavily dominated by a few larger member states, and this data indicates that this pattern may be continuing. This highlights a clear need for targeted capacity-building programs in Bulgaria and Lithuania, specifically focused on enhancing the internationalization and EU project management skills of their cluster managers to help them bridge this gap.

3. Expanded summary comparison table

The following table synthesizes the key findings from the detailed comparative analysis, providing a clear, at-a-glance overview of the cluster policy landscapes in Bulgaria, Lithuania, and Greece. All data is sourced directly from the "**Summary report on cluster policies and programmes across Europe (2022 edition)**" and the **2024 Country Factsheets** for each nation.

Metric	Bulgaria	Lithuania	Greece
Policy approach	Implicit/Broad Policy: Support is embedded within the "Innovation Strategy for Smart Specialisation (ISIS)" and "National Development Programme 2030."	Implicit/ Broad Policy: Support is channeled through the "Programme for EU funds' investments 2021-2027." A formal "Concept" exists but lacks concrete policy	Explicit/Dedicated Policy: A mature, multi-pronged national policy framework with over 10 years of continuity, featuring specific programs like "Innovation Clusters" and "Competence Centers."

		interventions.	
Policy maturity score (2022)	1.5/8.0: Reflects a broad policy approach and lack of specific policy continuity.	1.0/8.0: Reflects a broad policy approach and the absence of an implemented cluster-specific policy.	5.0/8.0: Reflects a dedicated policy, long-term continuity, but with weaknesses in performance evaluation.
Total profiled clusters (2024)	34	31	20
Geographic concentration	High: 71% of clusters (24 of 34) are located in the South-Western region (containing Sofia).	Very High: 84% of clusters (26 of 31) are located in the Capital Region.	High: 60% of clusters (12 of 20) are located in the Attica region (containing Athens).
Membership: SMEs	80% of total members.	76% of total members.	72% of total members.
Membership: research orgs.	11% of total members: Indicates emerging science-business linkages.	12% of total members: Indicates emerging science-business linkages.	17% of total members: Indicates the strongest and most formalized science-business linkages of the three.
Top employment ecosystems	Agri-Food (22%), Retail (17%).	Construction, Retail, Mobility-Transport-Automotive.	Tourism (~20%), Retail (~20%), Agri-Food (16%).
Top cluster ecosystems	Digital, Renewable Energy, Creative & Cultural Industries.	Digital, Health, Agri-Food.	Digital, Energy Renewables, Health, Construction.
Performance evaluation	Deficient: An evaluation of a past strategy (2005-15) found significant implementation failures. No ongoing M&E system for current policies.	Absent: The 2024 factsheet explicitly states "No data available" and "No policy evaluation has been identified."	Absent: The 2024 factsheet explicitly states "No policy evaluation has been identified for this programme."
Eurocluster participation (2024)	Emerging: 3 cluster organizations participate in 3 distinct Euroclusters (e.g., Construction, Electronics, Digital).	Emerging: 3 cluster organizations participate in 3 distinct Euroclusters (e.g., Creative Industries, Agri-Food, Health).	Mature: 8 cluster organizations participate in 8 distinct Euroclusters, spanning a wide range of strategic sectors.
EIS 2025 innovation performance	- Emerging Innovator; SII 51.6 (relative to EU = 100 in 2018), up from 45.2 in 2018 and slightly below 53.8 in 2024. - Strong improvements since 2018 in	- Moderate Innovator; SII 81.0, 18th among EU Member States; +17.4 points vs 2018, -3.5 vs 2024. - Strengths: tertiary	- Moderate Innovator; ranks 20th among EU Member States and 24th among the EU and neighbouring countries. - Strengths: top EU performer in the

	<p>investments in information technologies (+48.2 points), digitalisation (+33.6 points) and resource and labour productivity (+22.2 points), but persistent under-performance in Finance and support and Firm investments.</p>	<p>education (179.7, rank 4), non-R&D innovation expenditures (156.9, rank 2), venture capital expenditures (138.5, rank 8), digitalisation close to EU average (96.9, rank 14). Weaknesses: business R&D (26.9, rank 23), direct and indirect government support for business R&D (29.9, rank 20), trade impacts below EU average (56.2, rank 20).</p>	<p>Innovators dimension (score 181.4), driven by high shares of SMEs introducing product and process innovations and strong public-private co-publications. - Weaknesses: very low scores in foreign doctorate students, exports of medium and high-tech products, and design applications; part of the bottom-five group in the Trade impacts dimension.</p>
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Table 2 Overview of the cluster policy landscapes in Bulgaria, Lithuania, and Greece

4. Actionable policy recommendations for LDRs

Based on the granular comparative analysis of these three LDRs, the following five actionable recommendations are proposed. They are designed to provide a strategic roadmap for policymakers aiming to design and implement robust Smart Specialisation Strategies that effectively leverage clusters as engines of regional economic transformation.

The EIS 2025 results also point to why these recommendations matter specifically for LDRs. The gap between Moderate and Emerging Innovators remains wide at around 33 percentage points, with Emerging Innovators reaching only 57 percent of the EU average innovation performance. Bulgaria's SII of 51.6, compared to Lithuania's 81.0, illustrates the distance that still needs to be covered even between LDRs. At the same time, Greece's top position in the Innovators dimension, combined with weak Trade impacts, shows that strong SME-level innovation and mature cluster policies do not automatically deliver high-tech export growth. The recommendations below should therefore be read as a way to translate these scoreboard signals into practical policy choices for S3 in less developed regions.

These horizontal recommendations are also fully consistent with, and partly derived from, the remote-care-specific recommendations formulated in the IRHIS D1.1 "Mapping of Remote Care Innovation - Recommendations to Stakeholders". That deliverable synthesises desk research and 22 expert interviews across seven countries, including Bulgaria, Lithuania and Greece, and identifies a set of enabling conditions for scaling RPM and other advanced remote care innovations: (1) clear and aligned regulatory frameworks, including formal recognition of telemedicine/RPM and alignment with EU legislation such as the MDR, IVDR, GDPR, Data Act, AI Act and the European Health Data Space; (2) sustainable reimbursement models for digital therapeutics, telemonitoring and AI-assisted

diagnostics; (3) robust, interoperable digital infrastructure and cybersecurity, with enforcement of standards such as HL7 FHIR; (4) investment in digital skills and change management for healthcare professionals and patients; (5) structured, blended funding instruments that cover implementation and scaling, not only R&D; (6) cluster- and hub-mediated ecosystem collaboration and co-creation; and (7) continuous monitoring, evaluation and real-world evidence generation through national observatories and feedback loops. In this sense, strengthening cluster policy, improving alignment between health and innovation funding streams and institutionalising rigorous M&E in LDRs are not abstract governance improvements, but concrete levers to unlock remote care innovations that are already emerging in the health clusters and ecosystems mapped by IRHIS.

1. **Establish a formal, dedicated national cluster strategy:** The evidence from Greece powerfully demonstrates that an explicit, long-term national cluster policy provides superior focus, continuity, and results in interregional integration when compared to embedding cluster support within broad, multi-purpose strategies. LDRs should transition from implicit recognition to explicit policy action by developing a formal **National Cluster Strategy**. This strategy should not be merely a vision document; it must include clearly defined objectives tied directly to S3 priorities, a multi-year indicative budget to ensure predictability, designated governance and implementation bodies to ensure accountability, and a transparent, published set of eligibility criteria for clusters to receive support. This elevates cluster development from a minor objective to a core pillar of the national innovation and industrial policy.

2. **Implement a mandatory, results-based monitoring & evaluation (M&E) framework:** The pervasive and critical evaluation deficit identified in all three countries must be addressed as a top priority. To move from spending to investing, LDRs must mandate a robust M&E system for all cluster support initiatives from their inception. This framework should go beyond simple activity tracking and measure a balanced scorecard of KPIs, including:
 - **Input/Output KPIs:** Public funds disbursed, private investment leveraged, number of SMEs actively participating, number of joint R&D projects initiated, and number of staff trained.
 - **Outcome/Impact KPIs:** Documented growth in SME turnover and employment within clusters, increased export volumes for member companies, number of new products/services successfully launched, patents filed, and evidence of successful integration of member companies into new international value chains. Publishing an annual public report on these KPIs will create a vital feedback loop for policy refinement and ensure full accountability for the use of public funds.

3. **Adopt a dual-pronged S3 cluster alignment strategy:** The identified mismatch between the high-tech focus of clusters and the traditional employment bases of the economies requires a deliberate and balanced S3 approach. Policymakers should pursue a dual strategy to manage both economic transformation and social cohesion:
 - **"Modernization clusters":** Proactively launch and fund initiatives to create clusters in traditional sectors of high employment (e.g., Agri-Food, Tourism, Construction). The strategic focus here must be on driving the adoption of technology, digitalization, and sustainable practices to increase value-added, enhance resilience, and defend the existing economic base against global competition.

- **"Frontier clusters"**: Continue to nurture the organically formed high-tech clusters (e.g., Digital, Health-tech, Renewables) as strategic, long-term investments in economic diversification and future growth. Policy support for this group should be heavily focused on facilitating internationalization, improving access to venture capital, and strengthening linkages with leading European research programs and innovation hubs.

4. Enforce and incentivize deeper science-business collaboration: To accelerate the transition from simple co-location to genuine, high-impact innovation, policy must be designed to actively engineer and enforce linkages between industry and academia. LDRs can implement concrete, binding instruments that have been proven effective elsewhere, such as:

- **Funding conditionality:** Make the formal, active participation of at least one university faculty or public research institute a non-negotiable requirement for a cluster to receive public operational funding.
- **Targeted innovation vouchers:** Provide SMEs with non-transferable vouchers that can *only* be redeemed for R&D services, laboratory testing, or prototyping at public universities and research labs. This directly stimulates demand-led research and builds trust between the two sectors.
- **Co-financing of talent:** Develop programs that co-finance the salaries of PhD students and postdoctoral researchers who work on industry-defined R&D challenges within the cluster's member companies, creating a direct pipeline of skilled talent and applied knowledge.

5. Build a national capacity for interregional and EU-level collaboration: To improve the lower rates of participation in EU programs seen in Bulgaria and Lithuania and to emulate the success of Greece, LDRs must invest systematically in the internationalization capabilities of their cluster ecosystem. This requires creating a dedicated support structure that could include:

- **Systematic training and professionalisation:** Run a national program for cluster managers focused on the specifics of accessing EU programs like Euroclusters, Horizon Europe, and Digital Europe, including modules on consortium building, proposal writing, and project management.
- **Strategic networking support:** Provide travel grants and subsidized participation for high-potential cluster managers and SMEs to attend key European brokerage events, trade fairs, and technology showcases in their specific S3 priority sectors.
- **A "National cluster contact point":** Establish a single, highly visible entity or office responsible for actively promoting the nation's clusters to the international community, facilitating introductions to potential partners, and providing hands-on support during the formation of EU project consortia. This function is vital to helping LDR innovators successfully participate in and capitalize on the immense opportunities offered by interregional projects like IRHIS.