

CLUSTERS

Driving the Green and Digital Twin Transitions

A Policy Brief from the Policy Learning Platform on
Research and innovation

October 2021



**Interreg
Europe**



European Union | European Regional Development Fund



Table of Contents

- Summary 2
- Forewords 3
- 1. Introduction to Clusters 4
- 2. Cluster Life Cycle 7
- 3. European Cluster Initiatives 10
- 4. Selected Interreg Europe Projects 11
- 5. Policy Recommendations 12
- Sources of further information on clusters 17

Summary

This policy brief explores the importance of clusters for research and innovation. Clusters play an important role in industrial transformations as they support knowledge diffusion, knowledge spillovers, higher innovation and research activities, new business models, and can reconfigure industrial value chains. Clusters can support SMEs in their green and digital transformations through cross-border initiatives. At the intersection of regional and industrial policies, clusters and their place-based approach make Interreg Europe projects the ideal space for policy learning. This policy brief features five policy recommendations using the experience of Interreg Europe projects to inspire policymakers to better design and deliver cluster policies.

Acknowledgements: The authors would like to particularly thank our external contributors, **Marek Przeor, Balázs Barta, Daniel Cosnita, Rima Dijkstra, Maria Grazia Zucchini, Olaf Müller, and Rossana Borello** for their insightful contributions into some of the key policy issues currently facing clusters.



Foreword

Marek Przeor, Cluster Policy DG GROW, European Commission

Clusters have demonstrated how agile, flexible and creative they are since the beginning of the Covid-19 pandemic. They are ideal to lead the European green and digital transitions and build resilience as Europe recovers. Such networks reach quickly European firms, especially SMEs and improve their innovation potential, technological uptake, skills and internationalisation. They connect bottom-up and top-down initiatives. Clusters are well equipped to help public authorities co-design and adapt policy instruments, as envisaged in smart specialisation, to the needs of the industrial ecosystems.

The transition towards a clean, circular, and climate neutral economy requires integrating different communities, knowledge, markets. To make the circular economy a norm and reach the zero-emission target, we need companies, researchers, civil societies to collaborate accelerating green innovation and exploiting business opportunities in green markets. Clusters can lead this process. Clusters can also accelerate the digitalisation of our economy and increase the share of companies using the Internet of Things, cloud computing, big data analytics, artificial intelligence, cybersecurity and 5G. Clusters are fit to bridge the gap when shifting from knowledge-based manufacturing to data-driven manufacturing and digital skills. Clusters can cope with short-term disruptions and prevent long-term vulnerabilities in the EU value chains and thus strengthening EU strategic autonomy.

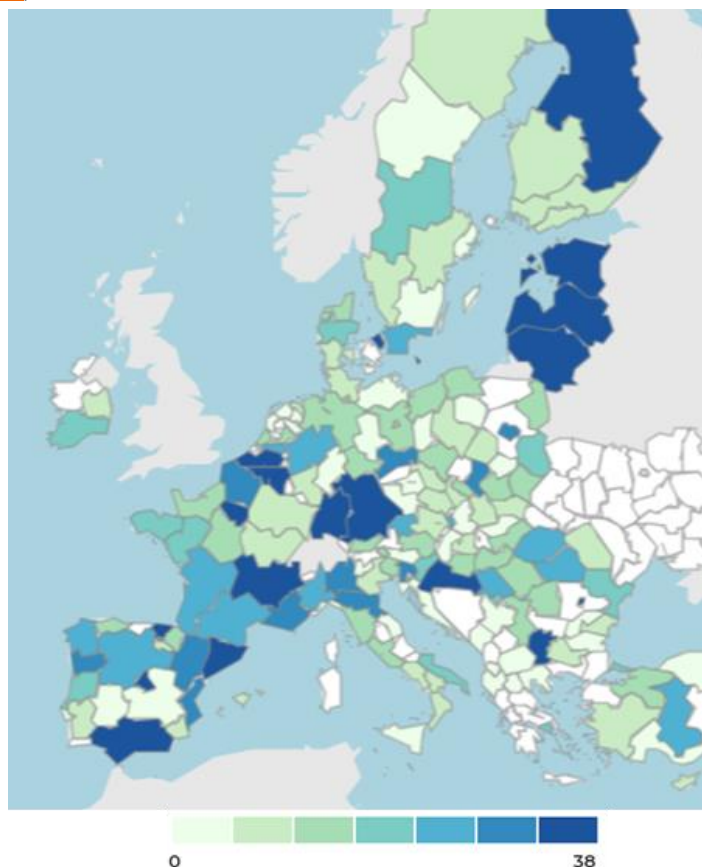
Interregional collaboration between clusters can only amplify the above roles that clusters have in the innovation/industrial ecosystems and unlock the full potential of the EU single market.



1. Introduction to Clusters

What are clusters?

A cluster is defined as “a geographic concentration of related companies, organisations, and institutions in a particular field that can be present in a region, state, or nation. Clusters arise because they raise a company’s productivity, which is influenced by local assets and the presence of like firms, institutions, and infrastructure that surround it” ([Institute for Strategy and Competitiveness](#)). **Cluster theory** suggests that competitive advantage derives not just from firm-based resources and capabilities, but also from the resources and capabilities located in the firm’s geographically proximate business environment ([OECD](#)).



Map 1. Number of cluster organisations in European Cluster Collaboration Platform (ECCP) per regions. Source: [ECCP](#).

Cluster-based Policy

Clusters constitute a significant part of the European industrial landscape. The geographic dimension has made clusters, a widely used policy tool for regions to stimulate research and innovation capacities particularly for SMEs. Indeed, **cluster-based industrial development** has been traditionally in the centre of implementing European, national, and regional growth strategies. Regional cluster policy is seen as a path to promote regional industrial modernisation, support the growth of SMEs, and encourage smart specialisation ([European Commission](#)). Several European regions have a long track record in cluster policy implementation, such as Flanders (the Netherlands), the Basque Country (Spain), Catalonia (Spain), Emilia-Romagna (Italy), Région SUD-Provence-Alpes-Côte-d’Azur (France), Auvergne-Rhône-Alpes (France), [Cluster Excellence Denmark](#), Lower and Upper Austria (Austria), Baden-Württemberg (Germany), Berlin-Brandenburg (Germany), Pomorskie (Poland), and North-West Romania (Romania).



Cluster policies are flexible policy tools that affect many elements of the regional policy-mix and can respond to a wide variety of policy challenges in diverse institutional contexts. **A cluster-based policy** can be built around different pillars, depending on the focus the policymakers would like to give emphasis to: **places** (leading regions, less-developed regions, metropolitan-hub areas) often as part of regional smart specialisation strategies (S3), **sectors** (dynamic, exposed, strategic, technological domains, social significance) or **specific actors or groups of actors** (universities, SMEs, multinationals, etc.). Often, they tend to be a combination of these different categories and form triple or quadruple helix innovation ecosystems.

Box 1. French Cluster Policy - Pôle de Compétitivité

Cluster-based policies can be initiated at the national and European level. In 2005, the French Government launched a national cluster programme called *pôles de compétitivité* to boost national competitiveness within a new industrial policy framework. The **cluster-based policy** aims to “bring together large and small firms, research laboratories and educational establishments, all working together in a specific region to develop synergies and cooperative efforts.” The *pôles de compétitivité* were selected out of a competitive bidding. The main policy objective was to foster university-industry collaboration and technology transfer in a complex French institutional framework prone to coordination failures. The French clusters have thus initiated diverse initiatives to support triple-helix collaboration at the regional level. The State provides funding supports to clusters by (i) partially financing cluster governance structures, and (ii) with public calls and financial aids to foster collaborative R&D projects and innovative partnerships. **France Clusters** is a knowledge platform that aims to favour learning and collaboration among cluster organisations in France. As of August 2021, there are **54 *pôles de compétitivité*** that are geographically defined in various strategic sectors that have either national, European, or global ambitions.

Clusters – Policy rationale and benefits

The primary objective of cluster policy is not cluster formation but the assumed benefits from clustering for innovative actors, namely enhancing **regional competitiveness and innovative capacities (OECD)**. They can also have secondary objectives such as maintaining employment, supporting new firms’ formation, promoting economic restructuring, promoting broader systemic collaboration among public and private research and technology organisations (RTOs), facilitating shared research and innovation infrastructures (RII), promoting cross-sectoral and cross-cluster partnerships, creating demonstration facilities, developing university-industry linkages, or building interregional partnerships and supporting the cluster members’ internationalisation.

The main policy rationale to design and implement cluster-based policies are linked to the reduction of system failures, **namely transaction costs and coordination failures (Woolthuis, Lankhuizen, and Gilsing)**. For regional policymakers, cluster policies are a convenient and pragmatic place-based organising principle to show political commitment, to pursue an innovation policy-mix, to efficiently mobilise public resources, to reach out to specialised SMEs, to prioritise strategic regional sectors, to build partnerships, and to foster triple-helix collaboration. Cluster-based policy, however, requires **long-term political commitment and financial support** as such initiatives must reach a critical mass to be self-sustaining.

Clusters are drivers of regional competitiveness and innovation capacities. The main assumption is that the concentration of firms, skilled-workforce, and specialised knowledge lead to enhanced productivity due to **agglomeration economies**, a form of external economies, which can be defined as services rendered without compensation by one producer to another one. **Agglomeration economies** can be classified into three categories, arising: from **labour market interactions**, which allow better matching between an employer and a worker as well as enhanced access to specialised skills; **from linkages and collaboration** between intermediate- and final-goods suppliers, which enable internal increasing returns; and **from knowledge spillovers**, which allow for workers to learn from each other (**Giuliano, Kang, and Yuan**).



Cluster (firms) have a 25% above average productivity. The [European Panorama of Clusters and Industrial Change](#) report has identified **2,950 regional industrial clusters**, which account for **almost every fourth job in Europe** (61.8 million jobs or 23.4% of total employment) and about **half of employment in exporting industries** (50.3%). The report categorises clusters into 198 high-performing clusters, 898 medium-performing clusters and 1,854 basic-performing clusters. Although clusters are responsible for a 25% above average productivity, productivity increases with cluster strength. In basic-performing and medium-performing clusters, productivity is 10-15% above average, while productivity in high-performing clusters is more than twice as high as the average (+140%).

Regions with the presence of dynamic cluster ecosystems are more resilient to economic shocks and can thus protect businesses during economic crises. Regions with strong clusters enjoy agglomeration economies that could mitigate the effects of recessions and the resulting increase in uncertainty. Strong clusters support industrial diversification, cross sectoral collaboration, inter-firm linkages, and pooling resources among related industries can mitigate shocks, and help local economies bounce back more easily ([Delgado and Porter](#)). The role of clusters in facilitating the **Green and Digital twin transitions** and responding to the current COVID pandemic are further evidence of their capacity to help regional economies adapt and respond to major economic paradigm shifts.

Cluster-based policies have also risks. The **main risks** refer to regional overspecialisation, weakening regional economic resilience, and leading to technological lock-ins ([Uyarra and Ramlogan](#)). Indeed, overspecialisation can lead to stronger economic shocks that can spillover to related sectors (for instance, aerospace industry in Toulouse during the COVID-19 crisis). Moreover, vested private interests, over-reliance on key firms, and policy myopia due to long-term investment strategies in specific sectors can generate regional lock-ins hindering path development.

Box 2. COVID-19 Challenges on Clusters

The geography of innovation has been challenged by the **COVID-19 pandemic**. The [European Commission](#) has identified five challenges for clusters resulting from the COVID-19 pandemic, namely:

- **Reorganisation of cluster supply chain networks:** firms and industries need to rethink their business supply chain models given uncertainties around supply shortages and increased benefits from procuring inputs from local partners.
- **Renewal of science-industry collaboration:** [university-industry collaboration](#) can accelerate moving-up Technology Readiness Levels (TRLs) and the development of frontier technologies.
- **Reinforcing technology clusters and their links to other clusters:** better linkages across technology clusters and with related industries can foster industrial renewal and technological transformation towards a more rapid recovery.
- **Finding new ways to access talent:** [skills for innovation](#), reskilling and redeploying staff to adapt to the changing context are critical for clusters' competitiveness. Moreover, the rapid shift towards remote working has prompted changes in the way talent and skills are sourced/accessed.
- **Reshaping global value chains:** with business travel on hold, tacit knowledge flows have also been affected, which affects the organisation of global value chains. This is both a challenge and opportunity to reshape connections and reconnect clusters in new ways internationally.



2. Cluster Life Cycle

Clusters typically develop in accordance with a life cycle, which includes an evolutionary sequence of stages—infancy, growth, maturity, and stagnation/decline or revitalisation—where actors from the private and public sector are engaged and where one or more cluster facilitators are coordinating and promoting the process ([Ingstrup and Damgaard](#)). **This policy brief will focus in particular on the cluster life cycle from the policy life cycle perspective** with the different stages—cluster identification, governance, implementation, and monitoring/evaluation.

Cluster Life Cycle – Identification

The identification of clusters can be top-down, bottom-up or a combination of the two. Policymakers often identify potential clusters using two different approaches: either (1) a statistical method, such as a mapping study, or (2) a process of self-selection, such as a call for proposals, for instance, the French Cluster programme ([OECD](#)).

Quantitative analysis can support the identification of clusters. Science and technology indicators such as investment in R&D, innovation, S&T human resources, patents, technology balance of payments, combined with cluster mapping techniques, such as location quotients and input–output models can be used for preliminary cluster identification. These quantitative tools have limitations as they don't capture emerging technology sectors nor fully the supply chain and forward market linkages, partnerships, knowledge sharing, social capital, and local sources of tacit knowledge ([Arthurs et al.](#)). As a result, **quantitative analysis must be complemented with qualitative analysis** such as interviews using expert opinion and survey of firms and innovation actors ([IKED](#)). The [European Cluster Collaboration Platform \(ECCP\)](#) offers [mapping tools](#) to explore cluster actor, region, or industry to identify specific value proposition for emerging clusters and facilitate interregional and cross sectoral cluster cooperation.

Box 3. The Policy Learning Platform can help you identify sectoral opportunities

The **Policy Learning Platform** organised an online peer review for the benefit of the [City of Szombathely](#) in Hungary in June 2021. The peer review aimed to identify economic diversification opportunities in the health sector in the host region. A [peer review](#) lasts 2 full days for selected peers to examine the specific territorial and thematic context to provide tailored policy recommendations based on their experience and expertise.

How did the peer review help you to identify complex rehabilitation as a potential sector?

Balázs Barta, Managing Director, PBN: *We started from a broad approach with economic diversification in the health sector and ended up selecting complex rehabilitation, with dedicated focus areas relevant to our context and innovation ecosystem actors. The peer review provided us with large amount of knowledge and inputs that took us weeks to fully process.*

New R&D facility. Enthusiastic local partnership. Committed experts contributing from all over Europe. Revealing financial and professional support for the coming decade. Precise focus on long-term comparative advantage. These are the results of an intense two days of working together in the framework of an Interreg Europe Peer Review.

Cluster Life Cycle – Governance

An important element of successful cluster-based policy is **governance at operational and strategic levels** to develop a shared vision, goals, and strategy. **At the operational level**, a cluster is often piloted by an organisation (not-for-profit or public-private legal entity) that coordinates the implementation of the



cluster activities to achieve strategic cluster objectives. The main stages of the cluster management cycle can be split into (1) Define, (2) Design, (3) Implement, (4) Monitor, (5) Evaluate, and (6) Revise (**PWC**). This cluster organisation must implement day-to-day cluster activities to respond to its stakeholders' needs and priorities coming from a more strategic governance level. The EC has supported the development of a cluster organisational labelling process which enables clusters management teams to both benchmark their performance with similar clusters and assess the quality of their management and ecosystem animation tools (see [European Secretariat for Cluster Analysis](#)).

Strategic governance refers to appointing cluster managers and evaluating their performance, setting the vision and strategy of the cluster and approving action plans. Cluster governance refers to the intended collective actions of cluster stakeholders to advance the cluster and develop a sustainable competitive advantage. Cluster governance thus represents the interests of cluster stakeholders (e.g. universities and research institutes, large companies and SMEs, government, supporting structures, etc.) (**PWC**).

Cluster Life Cycle – Implementation

Modern cluster policies aim to put in place a favourable business ecosystem for innovation and entrepreneurship, to promote [university-industry collaboration](#), to promote broader systemic collaboration among public and private research and technology organisations (RTOs), to accelerate the innovation process, to create demonstration facilities, to support new industrial value chains and 'emerging industries', and to tackle European Societal Grand Challenges. Modern cluster policies thus follow a systemic approach that combines different policies, programmes, and instruments that address **diverse market and system failures**.

Cluster operational activities that consist of the actual implementation of the action plan have thus considerably evolved to integrate a wider policy-mix. The policy tools used in cluster policies—going beyond networking and providing information—can be regrouped into three lines of action (See Table 1).

Improve Cluster Dynamics	New Technology	•Facilitate the diffusion of technology (events, workshops), •Build demonstrators and FabLabs to develop and test new technologies, •Create an observatory and technology watch, •Facilitate technology transfer, •Facilitate access to specialised expertise.
	Firm Growth	•Support cluster-based incubators, •Encourage entrepreneur networks, •Facilitate the creation spinoffs, •Support funding opportunities for startups.
	Inter-Actor Network	•Foster intra- and extra-cluster firm networks, •Form export networks, •Compile market intelligence, •Development of shared R&Ds, •Promote Joint R&D projects.
	Cluster Formation	•Conduct competence audit, •Undertake strategic study and analysis, •Engaged actors and communicate, •Promote cluster marketing.
Improve Cluster Environment	Factor Markets	•Provide management and technical training, •Promote skills development (skill centres, skills alliances), •Facilitate access to specialised capital markets, •Promote joint financing.
	Cluster Basis	•Improve the legal framework, •Create and /or mutualise the realisation of research and innovation infrastructures and projects, •Facilitate trust and social capital, •Promote joint financing.
Improve Cluster Strategic Leadership	Multi-level Governance	•Facilitate EU industrial initiatives, •Link actors from different EU member states, regions and their industrial ecosystems, •Lead the entrepreneurial discovery process in S3.
	Societal Challenges	•Lead the green transition, •Accelerate the digital transition, •Contribute to COVID-19 recovery efforts and resilience.

Table 1. Possible cluster actions. Source: the authors from the [European Commission](#) and [IKED](#).

Interregional learning and collaboration are crucial for cluster managers to avoid common pitfalls for cluster initiatives and programmes. Indeed, cluster initiatives are too often uncoordinated and



disconnected from EU, national and regional innovation strategies ([European Commission](#)). Moreover, cluster programmes are often narrowly focused on networking and often spread support too thinly, with critical mass lacking in both the cluster and the activities. As a result, cluster initiatives must understand the local institutional context to improve strategic leadership to pursue an integrated strategy at different governance levels. Cluster initiatives must also be more ambitious in their policy-mix to provide opportunities for **economic diversification in related sectors** to strengthen regional economic resilience through the reinforcement or creation of new industrial value chains ([European Commission](#)).

Cluster Life Cycle – Monitoring and Evaluation

Monitoring and evaluation allow—through evidence-based approaches—policymakers and cluster managers to revise their cluster strategies and actions. The function of monitoring and evaluation is twofold. First, they legitimate policy actions by proving their effects, and second, they deepen the understanding of the mechanisms behind measures supporting future decision-making ([Schmiedeberg](#)). **Cluster benefits are indirect** since, as mentioned above, the primary objective of cluster policy is not cluster formation but the assumed benefits of clustered firms in terms of the firms' competitiveness and overall regional competitiveness. Cluster monitoring and evaluation are difficult to conduct due to the complexity of influencing factors (often unobservable) and the mutual causality links embedded in a particular socioeconomic and institutional context ([Schmiedeberg](#)). While monitoring mostly serves policy implementation and informs cluster management, evaluation serves policymakers to revise and design better policies. Cluster managers and policy makers should work together to identify appropriate KPI's that meet the needs of cluster members (firms for example) and funding partners.

The [Smart Guide to cluster policy monitoring and evaluation](#) provides cluster managers and policymakers a clear framework and guidelines to design effective cluster monitoring and evaluation plans. Frequent monitoring uses indicators to explore the development of the cluster measuring direct effects—collaboration and collaborative dynamics and innovation and innovative capacity—and indirect effects—competitiveness and international attractiveness, firm-level economic performance, and system level. **For cluster evaluation**, different methodological tools are available to analyse the effects of clusters and cluster policies. **Policy input-oriented methods** explore the execution of the cluster programme, including the chronological progress, faced difficulties and procedural failures as well as subjective perceptions of participating parties. **Case study evaluation** is a research strategy, rather than a method that involves several techniques both of a qualitative and quantitative nature. **Econometric models** use counterfactual definition of causality often focusing on the clustered firms. **Systemic approaches** that provide a static descriptive view on the cluster at different timeframe to explore how the cluster has developed regarding its size and structure can use **input–output models**, **social network analysis**, or **benchmarking** (see [Smart Guide to cluster policy monitoring and evaluation](#)).



3. European Cluster Initiatives

Cluster-based industrial development is at the centre of new European growth strategy to lead Europe's twin transition of green and digital transformation ([European Commission](#)). In March 2020, the **European Commission** presented the [New Industrial Policy Strategy](#) that recognises clusters as a tool to drive the transformation to a more sustainable, digital, resilient, and globally competitive economy. Clusters could play an important role in promoting **Important Projects of Common European Interest (IPCEI)**—such as the [European Battery Alliance](#)—and fostering industrial alliances in strategic areas—such as the [Alliance on processors and semiconductor technologies](#) and the [Alliance for Industrial Data, Edge and Cloud](#). In the Pillar 3 of Horizon Europe, clusters can benefit from [funding opportunities](#) for [European Innovation Ecosystems \(EIE\)](#) that aims to build interconnected, inclusive innovation ecosystems across Europe, to reinforce network connectivity, to support European Partnership for Innovative SMEs, to reinforce S3 and innovation ecosystems and facilitate interregional innovation investments or I3 initiative (see [European Commission](#)).

With more than 1000 cluster organisations across Europe, the [European Cluster Collaboration Platform \(ECCP\)](#) is the online hub for European cluster stakeholders to engage in collaboration, networking, and learning. **ECCP** acts as an information and service facility providing tools for delivering better cluster policies and supporting the development of cooperation between clusters in Europe and beyond. Moreover, **ECCP** has been proactive to share solutions and collaborate in face of the COVID-19 pandemic with the [European Alliance Against Coronavirus](#). During this period the European Cluster Alliance, which gathers 14 National Cluster Associations representing more than 700 clusters, has successfully mobilised its members for cooperation, peer learning, information sharing, interest representation on issues like emergency response to the crisis and value chain disruptions.

During the programming period 2014-20, the European Commission has funded a wide range of cluster initiatives through COSME programme and Horizon 2020.

Under the COSME programme, the [European strategic cluster partnerships \(ESCPs\)](#) aims to encourage clusters from Europe to intensify collaboration across regions and sectors, notably in support of emerging industries. ESCPs encourage European clusters to cooperate, synergise and develop a joint 'European' strategic vision with a global perspective and common goals towards specific third markets. These partnerships can help European SMEs compete better internationally in strategic fields.

Under the COSME programme, the [Cluster Excellence Programme](#) supports cluster organisations and managers with capacity-building training and tools to strengthen cluster management, strategies and joint activities through benchmarking, training and mentoring, and to promote strategic interregional collaboration. The [European cluster excellence initiative](#) is a European cluster benchmarking methodology to improve cluster organisations' management processes and the quality of services for their members.

Under Horizon 2020, INNOSUP-1's [Cluster facilitated projects for new industrial value chains](#) aims to support emerging industries and value chains. INNOSUP-1 helps SMEs to innovate and develop interregional and cross-sectoral value chains by bringing different sectors and areas of expertise together to create new value chains across the EU and Horizon 2020 associated countries. To receive INNOSUP-1 funds, projects must allocate at least 75% of their total budgets to direct support for SMEs. This can include payments to SMEs, vouchers (up to €60,000) and services. Some [25 INNOSUP projects](#) were funded and some are still ongoing. The projects made good use of SME innovation voucher mechanisms that were distributed via open competitive calls. The experiences learned can be of value to regional policy makers and help them design and deploy similar innovation support voucher schemes.

In addition to the current cluster networking actions, the European Commission is also proposing a new instrument called [Joint Cluster Initiatives - EUROCLUSTERS](#) within the new Single Market Programme for the programming period 2021-27. The instrument will aim to shape European strategic value chains, to boost SME internationalisation and access to global value chains, and to facilitate industrial transformation (supporting SME uptake of innovation, value chain collaboration & scaling-up).



Box 4. How can the Policy Learning Platform support?

The [Interreg Europe Policy Learning Platform](#) can help regional policymakers to better design and implement cluster-based policy by facilitating the exchange of experience from different institutional contexts and showcasing success stories via the [Policy Learning Platform good practice database](#). In addition to the good practice database, the [Policy Learning Platform](#) can provide a forum for direct discussions among partners from different projects – either in thematic workshops, [matchmaking sessions](#), build linkages with INNOSUP/COSME cluster projects, peer review learning, or in webinar and online discussions, and provide expert advice through our on-demand [policy helpdesk service](#). Furthermore, the Policy Learning Platform organised a [cluster focused workshop](#) in Flanders in June 2018 and facilitated exchanges between selected Interreg Europe cluster projects and EU policy makers.

4. Clusters in Interreg Europe

Cluster-based development is a widely used research and innovation policy tool. A number of Interreg Europe projects are dedicated to developing and delivering better cluster policies, examples include:

- [CLUSTERFY](#) aims to foster clusters' **interregional collaboration and integration into global value chains (GVCs)**. The project specifically focuses on policies to enable clustering of **SMEs in Key Enabling Technologies (KETs)**.
- [CLUSTERIX2.0](#) looks at improving **regional innovation policies for clusters**, namely by **strengthening intra and interregional cooperation and university-industry linkages**.
- [CLUSTERS3](#) aims to **adopt cluster policies to improve S3 implementation**. The project focuses on the insertion of SMEs in the global value chains (GVCs).
- [STRING](#) aims to improve innovation policies for **food clusters while promoting stronger linkages with their regional innovation ecosystems**.

Although not directly dealing with cluster policies, other Interreg Europe projects have used the concept of clusters to deliver better policies such as [INNO4SPORTS](#), [IWATERMAP](#), [MEDTECH4EUROPE](#), [REMIX](#), [P2L2](#), [URBAN M](#) or in TO3 SME Competitiveness such as [CLIPPER](#).

Box 5. Interreg Europe projects bring policy changes.

In [ClusterS3](#), the **Basque Country** designed a programme to provide support to Cluster Management Organisations (CMO) to foster their roles in the S3 while increasing SMEs and territorial competitiveness. The programme requires CMOs to develop an action plan focused on delivering services and activities related to the S3 (identifying common challenges), competitive intelligence, launching working groups and projects (to solve those challenges) in the fields of technology R&D+i, internationalisation (trade missions, international trade fairs), talent development and sustainability. The peer review in Hungary and study tour in Piemonte, Italy, were essential to understand the importance of capacity-building for CMOs and introduce this policy change.

In [CLUSTERIX2.0](#), the **cluster organisation, NOI AG**, is responsible for managing and developing the South Tyrol Science and Technology Park—which involves more than 70 companies and innovative start-ups, 4 research institutions and 3 faculties of the Free University of Bozen/Bolzano—in leading regional priority sectors. The cluster organisation, an in-house company of the Autonomous Province of Bolzano, introduced a policy change regarding the design of services for digital fabrication at Makerspace. Learning from the good practice [Strategic Use of Design](#) from Denmark, NOI AG was able to add concepts such as Danish design ladder, process mindset and iterative processes in its makerspace service for prototyping.



5. Policy Recommendations

This policy brief provides five policy recommendations, from more general to more specific advice focusing on cluster policies. They are illustrated with good practices on clusters coming from Interreg Europe partners.

Policy recommendation 1. To promote clusters as drivers of change.

The first policy recommendation is **to promote clusters as drivers of change for the twin transition of digital and green transformations**. Clusters are crucial elements to lead the green transition, accelerate the digital transition, address societal challenges, and build resilience ([European Commission](#)).



Clusters can connect top-down directionality initiatives—such as the European Green Deal and Digital Europe—**with bottom-up industrial ecosystems**. As a result, clusters are important agents of change to foster the emergence of green businesses, and to co-design environmental and climate policies. Clusters and their industrial ecosystems can also be a driver to accelerate the digital transition and facilitate the uptake of digital solutions. Moreover, clusters can promote resilience using the collective intelligence of their members to cope with challenges and undergo transitions ([European Commission](#)). Several European clusters are playing a leading role in developing European Digital Innovation Hubs (EDIHs) as part of broader regional digital transformation initiatives. In some regions, such as Region SUD Provence-Alpes-Côte-d'Azur, clusters are active in supporting climate change action plans.

Box 6. To promote clusters as drivers of change : Green and Digital.

Clusters can be drivers of change, accelerators, and enablers of the green and digital twin transitions. In [CLUSTERFY](#), the [New Energy Coalition \(NEC\) cluster](#) promotes energy transition towards **Reliable, Clean and Efficient Energy** in northern Netherlands. The cluster has driven structural regional change from gas to sustainable energies as the outcome of a long-term public-private leadership based on a collective vision for the future driven by economic opportunities and the response to regional societal challenges led by citizen/association groups. Selected as a S3 priority and following S3 principles, energy transition, which initially had a broad focus, was narrowed down and refined over the years to seize emerging sectoral opportunities such as hydrogen and identify cross sectoral cooperation potentials with digital and health sector clusters.

Insights from the Policy Learning Platform

The [good practice was presented](#) in the Policy Learning Platform online discussion on [Smart specialisation strategies for sustainable and inclusive growth \(S4+\)](#). S4+ highlights the importance of regions to promote transformative changes and to address societal challenges. Innovation must not blindly follow competitiveness logic but must respond to broader regional and societal challenges and be an 'intermediate step towards the longer-term goals of fostering sustainability and inclusiveness'. **Clusters can also be crucial agents of change in driving S4+.**



Policy recommendation 2. To align clusters and Smart Specialisation Strategy (S3).

The second policy recommendation is for regional policymakers **to better align clusters and S3**. Both cluster policies and Smart Specialisation Strategies are policy approaches with a place-based dimension, aiming at exploiting advantages of proximity to promote economic growth and competitiveness in strategic sectors ([European Commission](#)).



In the S3 policy process, clusters have an important role to play on many dimensions such as:

- to participate in S3 governance,
- to define S3 vision and mission,
- to pilot S3 thematic working groups and the entrepreneurial discovery process (EDP),
- to identify strategic sectoral opportunities in emerging sectors,
- to participate into building critical mass in emerging sectors,
- to mobilise regional funding opportunities and attract external funding sources,
- to foster interregional collaboration partnerships.

Box 7. To align clusters and Smart Specialisation Strategy (S3).

Clusters can mobilise actors and funding around S3 priorities. In [P2L2](#), the [Regional Cluster support strategy](#) in Piedmont, Italy, **established seven regional innovation clusters in each S3 thematic area**. Back in 2009, the region was supporting 12 regional innovation clusters in 12 different thematic areas. **In 2015, the region undertook a process of revision of the clusters through launching a public call** for the constitutions of the following clusters: Smart Products and Manufacturing, Green Chemistry and Advanced Materials, Energy and Clean Technologies, Information and Communication Technologies, Agri-food, Textile, Life Sciences **to align them with the S3 strategic priorities**. The good practice highlights the role of clusters **in engaging actors around regional S3 priorities to promote regional economic restructuring**.

Recommendations from Interreg Europe community

[Rossana Borello](#), **Piedmont region**, highlights that to better align clusters and S3 priorities is one of the main objectives of the S3 process in Piedmont region. Indeed, clusters must link the regional innovation ecosystem together to facilitate cooperation among multiple stakeholders such as business, universities and other competence centres. Regional policymakers have a role to play to support clusters and their actions towards strategic objectives such as supporting skills development, internationalisation, entrepreneurship. Finally, we recommend to empower clusters giving them a strategic role in the S3 process by co-piloting the entrepreneurial discovery process and roadmap definitions.



Policy recommendation 3. To offer personalised support services.

The third policy recommendation is for clusters to **offer personalised services to SMEs** to address regional research and innovation weaknesses. These personalised services can assess and review innovation capabilities of private companies and provide roadmaps. Clusters can also provide digital and sustainable advisory services to respond to the digital and green twin transitions.



Box 8. To offer personalised support services

Collective services must address place-based challenges of the clusters' industrial ecosystems. In **CLUSTERIX2.0**, the **innovation audit** is a programme to assess and review the innovation and internationalisation capabilities of private companies in Romanian clusters. The **innovation audit** consists of three phases: (1) a questionnaire with 45 questions on innovation culture, innovation strategy, innovation management, networking, development of new processes and products, research and development (R&D), access to new markets, and management technology, is sent by the cluster management authority to private companies, (2) experts analyse the responses to the questionnaire and recommendations are sent out, and (3) meetings are organised to discuss on the future uptakes of recommendations **to improve SMEs innovation capabilities**. The **innovation audit** was key in the creation of **3 spin-offs in renewable energy and smart textiles**.

Recommendations from Interreg Europe community

Daniel Cosnita, **InPULSE Partners SRL**, highlights that while the methodology might seem classical at first glance, it is the joint team “consultant – cluster manager” that ensures its success. To the consultant team, it offers an easier access to the SMEs and facilitates the promotion of services; to the company, it offers a more filtered and focused access to relevant information and “tailor-made” support in view of innovation and internationalisation; to the cluster manager, it raises the level of trust from the side of the member companies, it helps management diversify the spectrum of activities and services and increases the degree of cooperation between members.



Policy recommendation 4. To promote university-industry collaboration

The fourth policy recommendation is for clusters to promote **university-industry collaboration** and broader collaboration among public and private research and technology organisations (RTOs). University-industry collaboration is a critical component of the innovation process. The promotion of clusters is one of the leading policy tools to promote knowledge transfer between science and industry, especially SMEs to strengthen regional competitiveness. **One of the policy objectives of clusters is to enhance collaborative innovation activities** between universities



(public laboratories, research institutes and higher education institutions) and industry (private companies) (read our policy brief on [university-industry collaboration](#)).

Box 9. To promote university-industry collaboration.

In [REGIONS4FOOD](#), the region of Emilia-Romagna launched a **regional large-scale R&D initiative** to support strategic collaboration between research laboratories and companies for the development and validation of innovative solutions in the agri-food sector. The initiative is based on the regional supporting scheme launched in 2015 to foster complex strategic projects in the field of Smart Specialisation Strategy (S3) and **strengthen regional clusters**. In particular, the initiative supports innovative actors scaling up the Technology Readiness Level (TRL) from lab testing (TRL4) to demonstration in industrial environment (TRL6) and commercialisation. The initiative financed 23 R&D projects (6 of them fostering digitalisation and traceability of agri-food products), involving 104 private companies and 96 research groups from the [High Technological Network](#) thus offering a policy approach to stir the emergence of **joint large-scale R&D projects**.

Recommendations from Interreg Europe community

[Maria Grazia Zucchini](#), [ART-ER](#), points out the importance of a regional innovation network, with a clear mapping of competences, to establish thematic S3 working groups to identify the most promising ideas for project proposals. The involvement of private companies in the project builds on the regional Clusters organised around value chains. In our region, they are regional communities of public and private actors integrated within the Emilia-Romagna High Technology Network to generate a cross-sectoral critical mass that aim to create novel opportunities and regional impact.

In [CLUSTERFY](#), [building bridges between science and industry](#) highlights the importance of **concentrating resources to create the necessary infrastructures to pursue ambitious R&D activities**. In Lithuania, [Santara Valley](#) was created to converge public and private R&D activities to conduct research in ICT, biotechnology, biopharmaceutical, and innovative medical technologies. Thanks to [Santara Valley leadership](#), triple helix stakeholders were able to join forces to build state-of-the-art innovation infrastructures allowing for **larger-scale university-industry collaborative R&D projects**. The large-scale investments, which amounted to over €200 million to launch Santara Valley, were crucial **in the emergence of the dynamic Lithuanian biotech cluster**.

Recommendations from Interreg Europe community

[Rima Dijkstra](#), [Agency for Science, Innovation and Technology \(MITA\)](#), highlights that effective and successful science-industry cooperation requires that both parties see mutual benefits in collaborating and are involved from the start of the process. One way to increase industry interest is to invite them to actively participate in the implementation of the regional innovation agenda and to share examples of already successful university-industry collaboration. Moreover, policymakers must ensure that research and innovation infrastructures are up to date, respond to the needs of industry and research, and are used to create innovative products, technologies, processes, and services.



Policy recommendation 5. To promote cross-cluster collaboration.

The fifth policy recommendation is **to promote cross-cluster collaboration**, which can be conducted at the regional, national, or EU levels. Cross-cluster collaboration can serve for cluster management capacity-building and for strengthening clustered firms' innovation capacities. Indeed, cross-cluster collaboration can aim to promote sharing cross-sectoral and interdisciplinary knowledge to foster cross-fertilisation and the recombination of different knowledge bases and lead to radical innovations. Cross-cluster collaboration is at the core of European cluster initiatives such as [European strategic cluster partnerships \(ESCPs\)](#) (see chapter 3).



Box 10. To promote cross-cluster collaboration.

In [TITTAN](#), [C3-Saxony](#)—clusters and entrepreneurship in support of emerging industries—promotes cross-cluster collaboration in Saxony, Germany. [C3-Saxony](#) connects the cluster Silicon Saxony (microelectronics) with the cluster Biosaxony (Life Sciences) to spur cross-cluster collaboration with the aim to promote knowledge diffusion, cluster resilience, and technological recombination. The initiative uses three main policy instruments—networking events, matchmaking events, and innovation vouchers—to promote cross-cluster collaboration. As illustrated in the good practice, cross-cluster collaboration in cross-sectoral value chains can be implemented at the regional scale.

Recommendations from Interreg Europe community

[Olaf Müller](#), [HEALTHY SAXONY](#), highlights that the main task and challenge of any cross-cluster collaboration is to create and maintain trust between the partners that are meant to be connected. Trust is essential to create an atmosphere wherein the giving supports in honesty and the receiving openly share their actual needs and challenges. Clusters should invest time and effort in finding a core network manager who is willing and able to create such atmosphere between partners. Furthermore, when co-existing in the same field, clusters should always collaborate. Anything else will result in a waste of resources.



Sources of further information on clusters

- European Commission - [Advanced Technologies for Industry](#)
- European Commission - [European Cluster Collaboration Platform \(ECCP\)](#)
- European Commission - [European Cluster Conference 2020 highlights](#)
- European Commission – [European Expert Group on Clusters](#)
- European Commission - [European Innovation Ecosystems](#)
- European Commission – [The Smart Guide to Cluster Policy](#)
- European Commission – [The Smart Guide to cluster policy monitoring and evaluation](#)
- Harvard University - [Institute for Strategy and Competitiveness](#)
- IKED – [The Cluster Policies Whitebook](#)
- Interreg Europe - policy brief on [Industry 4.0](#)
- Interreg Europe - policy brief on [Innovation Vouchers](#)
- Interreg Europe - policy brief on [Skills for Innovation](#)
- Interreg Europe - policy brief on [Smart Specialisation Strategy \(S3\)](#)
- Interreg Europe - policy brief on [University-Industry Collaboration](#)
- PWC - [Uncovering excellence in cluster management](#)
- TCI Network - [TCI Network](#)

If you have any additional policy questions regarding clusters, do not hesitate to contact us through our on-demand [policy helpdesk service](#).

Annexe 1: Selection of relevant Interreg Europe projects dealing with cluster policies

Project	Policy Objective
CLIPPER (TO3)	To create a leadership for maritime industries
CLUSTERFY	To foster interregional collaboration and integration into global value chains
CLUSTERIX2.0	To promote cluster policies for better university-industry collaboration
CLUSTERS3	To adopt cluster policies to improve S3 implementation
INNO4SPORTS	To promote innovation for sport innovation ecosystems
iWATERMAP	To support innovation policies in water technologies
MEDTECH4EUROPE	To foster research and innovation facilities in the field of medical technologies
P2L2	To design better policies for the sector of advanced materials
REGIONS4FOOD	To promote digitalisation of the agri-food sector
STRING	To promote innovation in food clusters
TITTAN	To improve European healthcare systems for healthy and active ageing
URBAN M	To stimulating innovation through collaborative maker spaces
REMIX	To encourage smart and green mining

#ResearchAndInnovation #InterregEurope

#clusters #twintransitions

#policylearning



Thematic experts:

Arnault Morisson & Marc Pattinson

a.morisson@policylearning.eu

m.pattinson@policylearning.eu

To cite this Policy Brief: Morisson, A. & Pattinson, M. (2021). *Clusters Driving the Green and Digital Twin Transitions*. Lille: Interreg Europe Policy Learning Platform.



**Interreg
Europe**



European Union | European Regional Development Fund