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European Observatory for Clusters and Industrial Change

Cluster programmes in Europe and beyond

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URL: https://www.clustercollaboration.eu/eu-initiatives/european-cluster-observatory

Table of Contents

Table of Figures

Table of Tables

List of abbreviations

AIC	Agriculture Innovation Cluster
APL	*Arranjos Produtivos Locais*, Local Production Systems
BMBF	*Bundesministerium für Bildung und Forschung*, Federal Ministry of Education and Research
BMWi	*Bundesministerium für Wirtschaft und Energie*, Federal Ministry for Economic Affairs and Energy
CAD	Canadian Dollar
CCAT	Connecticut Center for Advanced Technology, Inc.
CDS	Corporate Synergy Development Centre
COI	Centre of Innovation
COSME	Competitiveness of Enterprises and Small and Medium-sized Enterprises, Europe's programme for small and medium-sized Enterprises
CSTP	Council for Science and Technology Policy
DoD	Department of Defense
ECCP	European Cluster Collaboration Platform
EDA	Economic Development Administration
EFRE	*Europäischer Fonds für regionale Entwicklung*, European Regional Development Fund
EIGS	Enterprise for Innovative Geospatial Solutions
EOCIC	European Observatory for Clusters and Industrial Change
ERDF	European Regional Development Fund
ESCA	European Secretariat for Cluster Analysis
EU	European Union
EUR	Euro
EV	Electric vehicle
FDI	Foreign direct investment
GDP	Gross domestic product
GRW	Gemeinschaftsaufgabe "*Verbesserung der regionalen Wirtschaftsstruktur*" (Improvement of Regional Economic Structures)
GTP	*Grupo de Trabalho Permanente*, Working Group
ICCP	Industrial Complex Cluster Programme
ICT	Information and communication technologies
IDB	Industrial Development Bureau
I&E	Innovation & Enterprise

INADEM	*Instituto Nacional del Emprendedor*, National Institute for Entrepreneurs
INEGI	*Instituto Nacional de Estadística y Geografía*, National Institute of Statistics and Geography
IoT	Internet of Things
iPAS	Industry Professional Assessment System
IRIC	Regional Innovation Cluster
ISI	Innovation Superclusters Initiative
I&E	Innovation and Enterprise
JETRO	Japan External Trade Organisation
KIAT	Korean Institute for the Advancement of Technology
KICOX	Korea Industrial Complex
MDIC	*Ministério da Indústria, Comércio Exterior e Serviços*, Ministry of Development, Industry and Foreign Trade
METI	Ministry of Economy, Trade and Industry
MEXT	Ministry of Education, Culture and Sport
MIST	Marine Industry Science and Technology
MoEA	Ministry of Economic Affairs
MOTIE	Ministry of Trade, Industry and Energy
NASA	National Aeronautics and Space Administration
NOAA	National Oceanic and Atmospheric Administration
NE	*Núcleos Estadurais de apoio aos APLs*, State Nucleus for supporting Local Production Systems
NEV	New-energy vehicles
NIS	New Israeli Shekel
NIST	National Institute of Standards and Technology
NSF	National Science Foundation
OBAPL	*Observatório Brasileiro Arranjos Produtivos Locais,* Brazilian Observatory of Local Production Systems
OP	Operational Programme
ORIC	Ozarks Regional Innovation Cluster
PD	*Plano de Desenvolvimento*, Development Plan
PITCE	*Política Industrial, Tecnológica e de Comércio Exterior Industrial*, Technological and Foreign Trade Policy
PR	Public relations
RDI	Research, Development, Innovation
R&D&I	Research and development and innovation
RIC	Regional Innovation Cluster
RIE	Research Innovation Enterprise

RTDI	Research, Technology Development and Innovation
SBA	Small Business Administration
SBIR	Small Business Innovation Research
SME	Small and Medium-sized Enterprises
SMEA	Small and Medium Enterprise Administration
STI	Science, technology, innovation
STIP	Science and Technology Industrial Parks
S&T	Science and Technology
TARIC	Taskforce for the Advancement of Regional Innovation Clusters
TBI	Technology Business Incubator
UAS	Unmanned Aerial Systems
USD	United States Dollar
VC	Venture capital

Executive Summary: Cluster support in Europe and beyond

This report provides an overview of national and regional cluster support in Europe as well as a selection of non-European countries, based on information on cluster policies and cluster programmes or other interventions to support cluster activities. With this horizontal overview, it complements the *Smart Guide to Cluster Policy* that identified good practices.[1]

In total, the report delivers comprehensive information on the support for clusters in 29 European countries, including in-depth analyses of **30 national cluster programmes in 20 countries**. In addition, it contains information on regional cluster support on the basis of replies to a survey from 49 regions from 16 European countries. While 38 of these regions stated that they currently operate regional cluster strategies or policies, the analysis covers **55 cluster programmes in 27 regions** for which detailed information were available. In addition to the **partial regional overview**, cluster policies in ten non-European countries are analysed to provide an additional **international perspective**.

The analyses show that **policies or strategies in support of clusters are widespread** both in Europe and worldwide. Even though the concrete design and implementation of cluster policies is context-specific and follows the overall rationale of national/regional policies in the different territories, it is possible to identify various similarities in the approaches analysed:

Clusters are either supported through **dedicated cluster programmes or through the integration of cluster support in other programmes** for economic support. In general, cluster policy pursues a broad range of objectives. In Europe, the most important objectives are to strengthen the cooperation structures of different stakeholders, to increase small and medium-sized enterprises' competitiveness, and internationalisation activities (at country level) or industrial modernisation (at regional level).

Outside Europe, objectives going beyond competitiveness, SME support and innovation are also high on the agenda, e.g. **promoting growth-oriented firms** (Canada), further promoting research and development and high-tech industries (Canada, China), supporting the **shift towards a knowledge centre** in a specific technology (Israel), **creating socio-economic impact** from research (Singapore). Achieving a more balanced **territorial development** is also central in some countries (e.g. Mexico, Taiwan, South Korea and Japan).

Most often, cluster policies are related to innovation, research and development or technology support. Supporting clusters is thus interlinked with fostering research, technology development and innovation by promoting collaboration between different

[1] http://ec.europa.eu/growth/content/smart-guide-cluster-policy-published-0_en.

actors in a specific territorial setting. In European countries, particularly at the regional level, cluster support is frequently connected to regional innovation strategies and/or Smart Specialisation Strategies. Here, clusters are a **dynamic tool to develop and promote strategic fields of sectoral and/or technological specialisation** crucial to the economic development of regional industrial systems.

Cluster support is also frequently oriented towards the promotion of small and medium-sized enterprises (SMEs) - a business segment that represents the majority of companies in many industrial ecosystems. Taken together, clusters can be considered as **integral elements of the policy mix and intersections between innovation, strategic specialisation and SME support**. This triad of interrelated goals aims to boost regional development and growth by triggering innovation, research and development in a collaborative setting, involving different types of stakeholders, including reaching out to groups of SMEs.

Cluster support is also related to territorial development, but this objective seems to be superseded by innovation-related goals. This shows once more that research, technological development and innovation - triggered by clusters - is perceived as an **important vehicle in promoting the further development of territories and their business systems**.

Most cluster policies pursue a **mixed strategy**, by supporting both established and mature industries as well as emerging industries or fields of industrial activity. In this respect, cluster programmes target industrial transformation by **using clusters as facilitators of change**. However, there are differences according to the level of governance: national strategies tend to focus more on new, emerging and/or high technology fields, while regional strategies focus slightly more on clusters in existing regional industries.

Embedded in the specific governance setting of each country, cluster programmes are **implemented by a broad range of actors**. Cluster organisations are often invited to participate in government calls for proposals. The range of stakeholders addressed and annual budgets vary (up to EUR 144 million in France). All participants in the national cluster programme survey stated that cluster programmes will maintain or even increase in **importance in the future**. Amongst the aspects rated as highly important for supporting the further development of clusters are the development of skills, human resources and training – with information provision, matchmaking and research & development funding also cited.

In most of the countries analysed, there is a certain tradition of cluster policy and is among the **advanced policy instruments**. In the Asian countries in particular, cluster support builds on other approaches such as supporting industrial agglomerations. In countries with a long-term cluster policy tradition, it is possible to identify certain development paths, mostly **towards higher specialisation or specific objectives such as internationalisation**. This indicates the development cycle of clusters and the evolution of cluster policies. In some cases, these development paths reflect changing framework conditions or economic

development goals, mainly at macro-economic level. In Asian countries, the analysis shows development paths from industrial to innovation clusters, while in Europe, it is possible to observe a shift towards emerging fields at the technological and/or industrial level and towards specialisation.

In summary, even though cluster support has different rationales, visions and characteristics in the countries and regions analysed in Europe and beyond, it can be shown to be a **crucial instrument for economic development** (see also table 1 that shows main differences among and lessons learned from the cluster programmes analysed). It is strongly interconnected with other policies and strategies and pursues a range of objectives. The medium- and long-term tradition and development of cluster support as well as the high importance attributed to cluster policy shows the significance of this policy instrument in Europe and beyond.

Table 1 - Main differences among and lessons learned from the cluster programmes analysed

	Europe: National level	Europe: Regional level	International examples (national level)
Main differences	• Most European countries implement cluster policies with dedicated cluster programmes (20 out of 29 European sample countries).. Further countries pursue individual approaches, including EU programmes • Some countries provide cluster support within one specific programme, while others have various supporting programmes with specific targets • Most cluster programmes address various different objectives, but some countries implement programmes with a focus on one specific objective • Annual budgets for cluster support vary according to the scope and size of the programmes (up to EUR 144 million annually); the highest budgets are reported in France, Hungary and the United Kingdom • Most European countries address clusters in emerging fields, often in parallel to mature industries • Cluster programmes either address cluster organisations and/or further private and public actors (business, research, associations)	• The majority of regions have regional cluster policies or strategies in place (38 out of 49 sample regions). Of these, 26 regions operate dedicated regional cluster programmes • Regional Innovation and Smart Specialisation Strategies, as well as Operational Programmes are important vehicles for cluster support • In most regions, cluster support is delivered as part of regional programmes, but some regions take the European, national and regional governance levels into account • Existing regional industries receive higher priority than emerging industries when it comes to SME support • Cluster programmes and cluster organisations are in most cases financed from various sources, but public funding plays a crucial role (with EUR 2.32 billion of planned investments under the European Structural and Investment Funds) • Annual budgets for cluster support vary; the largest are in Limburg and the French regions (and their *pôles de compétitivité*) • Regional cluster support addresses a specific set of stakeholders, notably cluster organisations, partly combined with further private or public actors; some regions exclusively address cluster organisations	• All countries analysed support clusters, but the government's role is perceived differently. The United States, Israel, Canada, China, Taiwan, Singapore, Japan and South Korea implement dedicated cluster programmes • Approaches in some countries (Brazil, Taiwan, Mexico) are at territorial level, while others (Canada, Israel, China, Singapore, South Korea) have a sectoral or technological orientation • In the Asian countries, cluster policies have been developed and implemented through a top-down, government-led approach • Cluster policies in Canada, China or Singapore narrowed their focus over time in order to focus on a small group of high-end and internationally competitive clusters. Other countries use clusters as vehicle to stimulate private activities (USA), to target technologies or further strategic goals (Israel, Singapore, South Korea, Japan) or local development (Brazil, Mexico, Taiwan) • Public support to clusters can be limited to the launching, growth and stabilisation phase (e.g. Japan)

	Europe: Nation al level	Europe: Regional level	International examples (national level)
Lessons learned	• Cluster support is strongly related to innovation and technology policies and R&D support, business development and competitiveness, with a specific focus on SME support • Cluster policy is related to various policies and proves to be an established and integral element of the national policy mix • Many countries pursue mixed approaches of supporting existing and new industrial activities; the focus on emerging activities has gained in importance over time • Clusters are also used as instrument to promote internationalisation activities • The further evolution of existing clusters is prioritised over the development of new initiatives • Funding of cluster programmes originates to a large extent from the public sector, but the private sector also strongly contributes • The implementation of cluster policies is realised at ministry level, often in cooperation with further bodies • A high level of interaction between strategic and operative levels of cluster support enables feedback processes • Cluster organisations are the main group of beneficiaries from cluster programmes, but further private or public actors are also addressed, depending on the objectives and scope of the programmes • Cluster support is considered a successful means to pursue strategic objectives, and cluster programmes will maintain or increase their importance in the near future	• Cluster support is an important vehicle for supporting research, development and innovation, industrial modernisation and shaping favourable framework conditions, thus targeting the future orientation of the regional industrial fabric • Cluster support is frequently delivered in the context of Regional Innovation Strategies, Smart Specialisation Strategies and Operational Programmes, i.e. a combined approach that involves the different governance levels • Various (public and private) sources are used to fund cluster programmes and cluster organisations • Cluster policy interventions target emerging activities, but also have a focus on strengthening and modernising existing industries in the region • Cluster support focuses strongly on supporting SMEs, cross-sectoral collaboration and professionalisation of management organisations, i.e. the further evolution of (existing) cluster activities • Cluster support is either implemented to address cluster organisations and/or to target business or research actors, i.e. addresses cluster actors directly and/or the regional framework conditions • High interrelationship and feedback processes between regional policy and cluster organisations contribute to strategic planning • Clusters have a high degree of pertinence for regional development: all sample regions will maintain or increase the importance of cluster programmes in the near future	• Every country has its specific perception and rationale for cluster policies, which is embedded in the governance structure, and the general philosophy of economic policy • Cluster development is mostly supported through dedicated cluster policies and supporting programmes, aiming at competitiveness, innovation, entrepreneurship • Cluster approaches are a vehicle for pursuing strategic policy goals: the development of targeted technologies, of internationally competitive industries, the local ecosystem, or territorial development • Top-down policies are significantly strategic and future-oriented in character, while bottom-up developments are related to existing business activities • Cluster approaches focus on boosting existing strengths. In some cases, clusters are based on existing agglomerations and the technological or scientific infrastructure • Cluster policies are evolving over time and in line with strategic development goals • The involvement of the private sector at all stages of cluster programmes' life cycle is key for achieving cluster policy goals • In the initial phase, clusters focus on their internal development; at a certain degree of strength and maturity, they develop internationalisation strategies (inward and outward investments) • The high strategic importance and level of investment for cluster support shows the pertinence of this policy

Source: European Observatory for Clusters and Industrial Change, analysis of cluster programmes 2018

1 Introduction

A strong and modern industrial base is a key element of Europe's competitiveness, for growth and employment. Industrial modernisation involves activities and investments to develop and implement new technologies including digital technologies and new business models as well as innovation in services, in order to create innovation on the product, process and service levels. Business networks and clusters are considered a pertinent lever for supporting industrial modernisation and innovation, particularly for small and medium-sized enterprises (SME).[2] Policy intervention in support of clusters and their eco systems can therefore contribute to advancing industrial development and innovation. Sharing information on different experiences among various stakeholders across Europe supports the diffusion of successful policy practices and mutual policy learning.

This report aims to contribute to the goal of supporting cluster policy learning among various European stakeholders. It is one of the activities of the European Observatory for Clusters and Industrial Change[3] and focuses on a cluster policy mapping that involves information on policy interventions in support of clusters.

The report provides an overview of cluster programmes in the EU Member States as well as in third countries participating in Europe's programme for the competitiveness of small and medium-sized enterprises (COSME). This is complemented by information on programmes for supporting clusters in various European regions and selected international examples. Thus, this report analyses and presents initiatives that have been launched to support clusters at the national and regional levels in Europe and beyond.

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[2] See for instance: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (2014): For a European Industrial Renaissance, COM(2014) 14 final, http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014DC0014&from=EN; Communication from the Commission (2010): Europe 2020. A European strategy for smart, sustainable and inclusive growth, COM(2010) 2020 final, available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF; Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions (2008): Towards world-class clusters in the European Union, http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52008DC0652R(01)&from=EN.

[3] https://www.clustercollaboration.eu/eu-initiatives/european-cluster-observatory. See also "The European Observatory for Clusters and Industrial Change in Brief" at the end of this report.

The findings of this stocktaking update the information presented in the 2015 report on European cluster policies.[4] It will also be integrated in the mapping of cluster programmes provided by the Cluster Collaboration Platform.[5]

The analysis of cluster programmes is linked to various other activities of the European Observatory for Clusters and Industrial Change (EOCIC), in particular with different events that discuss specific aspects of cluster policy, such as the European Cluster Policy Forum[6], the EU Cluster Weeks[7] and the European Cluster Conference[8]. The cluster programme mapping presented in this report delivers background information for these discussions and a comparative perspective on cluster supporting activities.

The findings of this report also feed into the *Smart Guide to Entrepreneurship through Clusters*, which has a specific focus on entrepreneurship, start-up and scale-up activities. Furthermore, some information on what is happening in the regions is of interest for assessing the framework conditions of cluster activities in European regions, and the tailored advice to model demonstrator regions being provided by the EOCIC.

The analyses in this report draw on the answers to national and regional online surveys which were sent to persons in charge of designing and/or implementing cluster policies in their countries or regions, as well as on targeted information search in non-European countries. In total, the report includes information for 29 European countries and 49 European regions provided by 90 respondents, as well as for 10 selected countries outside Europe.

The authors of this report are highly grateful for the in-depth information provided by policy stakeholders and would like to thank all respondents for their interest and time to deliver information on cluster support in their countries and regions.

1.1 Purpose of the document

This report presents the results of two online surveys conducted between February and September 2018 in European countries and regions, and of targeted information search on cluster programmes in selected countries outside Europe. This stocktaking of cluster programmes aims to deliver the basis for gathering information on strategies and

[4] European Commission (ed.) (2015): Cluster Programmes in Europe. Report, European Cluster Observatory. Prepared by Dr. Gerd Meier zu Köcker, Lysann Müller, VDI/VDE-IT, https://ec.europa.eu/docsroom/documents/12925/attachments/1/translations/en/renditions/pdf.

[5] https://www.clustercollaboration.eu/.

[6] https://ec.europa.eu/growth/content/first-european-cluster-policy-forum-sets-agenda-discussions-eu-countries_en.

[7] https://www.clustercollaboration.eu/event-calendar/eu-cluster-weeks.

[8] https://ec.europa.eu/growth/content/european-cluster-conference-450-participants-connecting-ecosystems_en.

policies for cluster support and their implementation, ultimately contributing to mutual policy learning and the exchange of experience among countries and regions.

1.2 Structure of the document

The document is structured as follows:

- **Chapter 2** presents cluster policies and programmes in European countries, based on a national cluster programme survey;
- **Chapter 3** deals with the regional level of policy interventions in Europe;
- **Chapter 4** presents the results of ten country cases outside Europe;
- **Annex A** explains the methodology used; and
- **Annex B** displays characteristics of cluster policy interventions in the examined countries and regions.

2 National cluster programmes in the European Union and in COSME countries

This chapter presents the results of the cluster programme survey to EU Member States and to other third countries participating in Europe's programme for small and medium-sized enterprises (COSME).

2.1 General information on national cluster policies in Europe

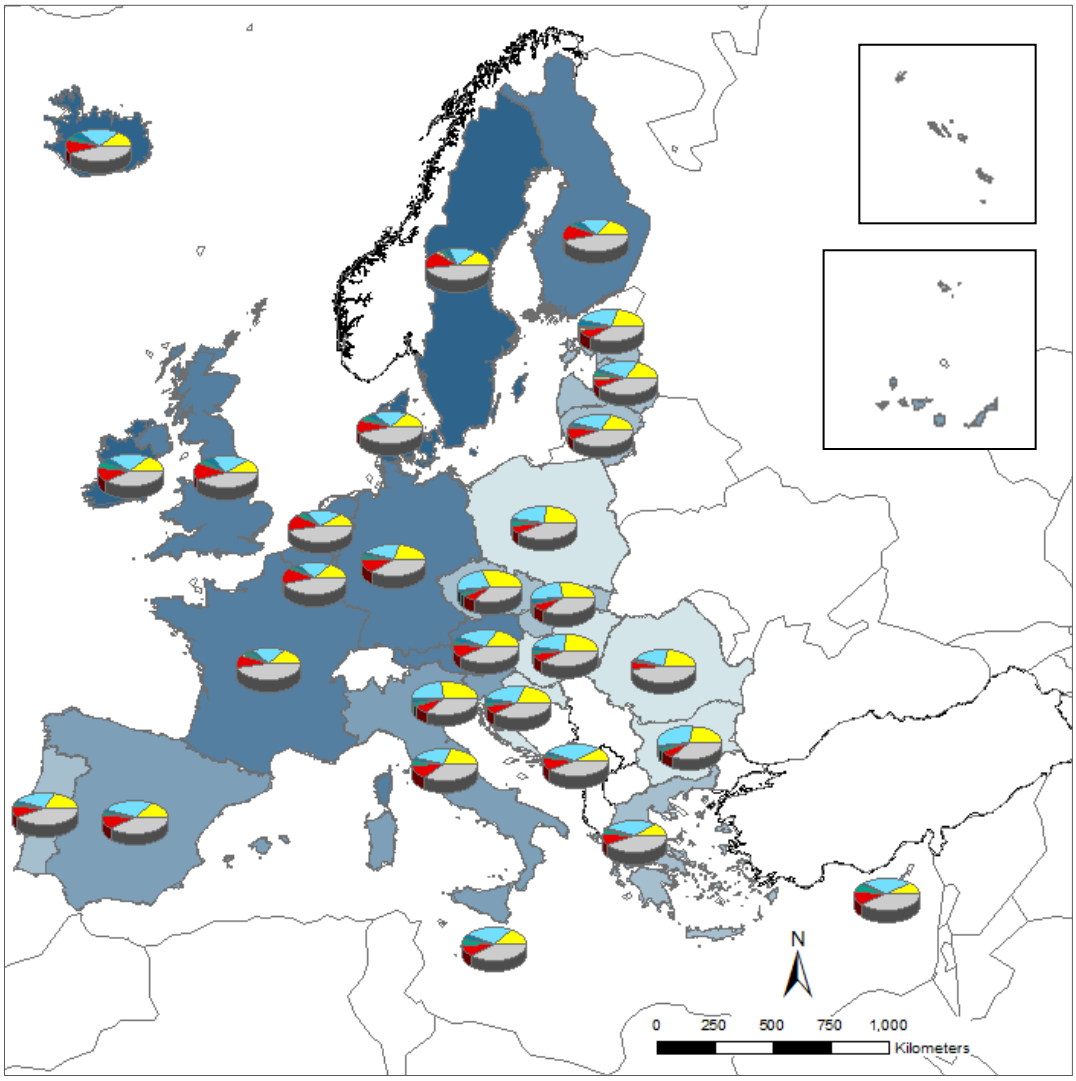
As part of the online survey of representatives of EU Member States as and countries participating in the COSME programme[9], the European Observatory for Clusters and Industrial Change collected information on cluster support in 29 countries.[10] Figure 1 provides basic economic data for these 29 countries, showing the gross domestic product (GDP) per capita in 2016 and the industrial composition.

The GDP/capita in 2016 ranged between EUR 6,354 and EUR 58,800 in the 29 countries considered. The EU-28 value was EUR 29,200, which was exceeded by the sample countries of Ireland, Iceland, Denmark, Sweden, the Netherlands, Austria, Finland, Germany, Belgium, the United Kingdom and France (in descending order). There are also obvious country-specific variations because of the sectoral structure of the national economies, measured in terms of employment in selected branches. In the Czech Republic, Slovenia, Slovakia, Hungary, Poland, Bulgaria, Romania, Germany and Estonia (in descending order), industrial branches absorb more than 20% of the total employment, while the ICT and financial sectors in the 29 countries only rarely (in Iceland and Ireland) exceed 5%. Wholesale takes between about 19% and 35% of the employment in the countries considered. Miscellaneous sectors have a considerable weight in most countries; agriculture, construction, public administration, defence, education, human health, social work activities, arts, entertainment and other service activities absorb between 34% and 48% of the employment of the sample countries (EU-28: 42.2%).

[9] https://ec.europa.eu/growth/smes/cosme_en.

[10] Further information on the survey methodology is in annex A.

Figure 1 - Basic economic data of countries participating in the EOCIC national cluster programme survey 2018



Source: European Observatory for Clusters and Industrial Change. Data sources: Eurostat; Statistics Iceland 2017,[11] *Statistical Office of Montenegro.*[12] *© EuroGeographics for the administrative boundaries. Map produced with ESRI ArcMap 10.*

Legend:

GDP/capita (€, 2016)
- 6,354 - 11,600
- 11,600 - 17,900
- 17,900 - 27,700
- 27,700 - 41,300
- 41,300 - 58,800

Employment 2016
- Industry (except construction)
- Wholesale and retail trade, transport, accommodation and food service activities
- Information and communication
- Financial and insurance activities
- Real estate activities
- Professional, scientific, technical activities; administr. and support service activities
- Other

[11] Iceland in figures 2017, https://www.statice.is/media/50481/icelandinfigures2017.pdf.

[12] Table gross domestic product, download at: https://www.monstat.org/eng/page.php?id=19&pageid=19.

Table 2 summarises the results of the information provided by representatives of the EU Member States and other COSME countries that responded to the national online survey. In addition to cluster programmes currently implemented in the different countries, it also includes information on past activities and/or plans for the future, as well as information on alternative approaches for promoting clusters. Together with further comments provided by the respondents, it is possible to provide a rich picture of activities in support of clusters.

In total, table 2 shows that a variety of initiatives are in place for the support of clusters. In many countries, clusters are supported through dedicated programmes. Some countries also integrate cluster support in other programmes such as programmes that target the development of small and medium-sized enterprises (SMEs), in innovation policy programmes (e.g. Lithuania) or in the Operational Programmes for the European Structural and Investment Funds (ESIF). The ESIF viewer[13] also shows that Europe's regions have foreseen EUR 2.32 billion of planned investments for the category of intervention (063) of "Cluster support and business network support primarily benefitting SMEs". Italy, UK, Germany, Portugal, Poland, France and Greece are the countries in which funding of above EUR 100 million was envisaged for cluster support in the period 2014-2020. Cluster support is thus considered a pertinent element of economic policies in European countries.

Table 2 also displays the duration of national cluster programmes. These figures generally refer to the programmes that are currently being implemented. In practice most of the countries can rely on an experience with cluster policies that goes back further than the beginning of the current programmes.[14]

[13] S3platform.jrc.ec.europa.eu/esif-viewer.

[14] The German "Internationalisation of Leading-Edge Clusters" programme for instance follows the "Leading-Edge Cluster Competition" that supported 15 leading-edge clusters for a period of up to five years. It aimed to improve Germany's position as an innovation location through targeted support of excellent clusters. See https://www.spitzencluster.de/, https://www.bmbf.de/de/der-spitzencluster-wettbewerb-537.html. Cf. also page 30.

Table 2 - Overview on current cluster policies in Europe

Country	Cluster Programme	Duration
Austria	Nationale Clusterplattform https://www.bmdw.gv.at/Innovation/ClusterplattformOesterreich/Seiten/default.aspx	Since 2008
Belgium	In Belgium, industry, research and innovation aspects as well as cluster support is handled by the regional authorities (see chapter 3).	
Bulgaria	Currently no cluster programme in place, but the development of a cluster programme is foreseen for the near future. The creation and development of most of the Bulgarian clusters is the result of the financial mechanisms for cluster support implemented under the structural investment funds, specifically the Operational Programme Innovation and Competitiveness 2014-2020.	
Croatia	Currently no cluster programme in place, but cluster support granted in the past (until 2014). At present, clusters are supported through European Union funds, specifically the Operational Programme on competitiveness and cohesion.	
Cyprus	Currently no cluster programme in place, but the development of a cluster programme is foreseen for the near future.	
Czech Republic	Cooperation Clusters https://www.mpo.cz/cz/podnikani/dotace-a-podpora-podnikani/oppik-2014-2020/programy-podpory-op-pik/	2014-2020
Denmark	Innovation Networks https://ufm.dk/forskning-og-innovation/samspil-mellem-viden-og-innovation/viden-netvaerk-og-kommercialisering-til-virksomheder/klynger-og-innovationsnetvaerk/innovationsnetvaerk The Ministry of Higher Education and Science does not provide basic, institutional or operational support for cluster organisations. However, innovation networks, focussing on academia-industry dissemination and cooperation activities, can be hosted by cluster organisations, as well as knowledge institutions. Regional authorities have also supported cluster initiatives. The Danish Executive Board for Business Development and Growth, established in late 2018, will support cluster-based activities and publish a strategy that will consolidate publicly supported cluster initiatives and innovation networks within a limited number of national strongholds.	2019-2020
Estonia	Estonia successively operates a cluster programme (https://www.eas.ee/service/development-of-clusters/?lang=en): Supporting cluster development	2008-2013
	Support for cluster development	2014-2020
	The development programme of clusters	2015-2018 2019-2023
Finland	Currently no cluster programme in place, but cluster support was granted in the past.	
France	Politique des pôles de compétitivité, launched in the mid-2000s. In its first phase, 67 competitiveness clusters were selected for support. For the current fourth phase, 56 clusters in 13 metropolitan regions and 2 French outermost	Since 2005 (3rd phase:

Country	Cluster Programme	Duration
	regions were awarded the *pôle de compétitivité* label for a duration of four (48 *pôles*) or one year (eight *pôles*).[15] http://competitivite.gouv.fr/	2013-2018)[16] 2019-2022 (4th phase)
Germany   	Currently more than 4 programmes in place. Three current core cluster activities of the Federal Ministry of Education and Research (BMBF) (and the past prominent Leading Edge Cluster Competition) are listed below. Other BMBF programmes are used by clusters in order to support their future development. Further players in cluster support are the Federal Ministry for Economic Affairs and Energy (BMWi) and the German regions (Länder). KMU-NetC https://www.bmbf.de/de/kmu-netc-3244.html	2016-2022
	Internationalisation of Leading-Edge Clusters, Forward-Looking Projects and Comparable Networks (Clusters - Networks - International) https://www.bmbf.de/en/internationalisation-of-leading-edge-clusters-forward-looking-projects-and-comparable-1416.html	2015-2022
	Innovationsforen Mittelstand (Innovation Fora SMEs) https://www.unternehmen-region.de/de/innovationsforen-mittelstand-1787.html	Since 2016
	Spitzenclusterwettbewerb (Leading-edge cluster competition) This competition allocated EUR 600 million of support to clusters. It had three rounds of competitive calls which each time selected five leading-edge clusters. The successful cluster organisations each received up to EUR 40 million of funding for a maximum of 5 years. https://www.spitzencluster.de/.	2008-2017
Greece   	The national programme 'Creation of Innovation Clusters - A Greek Product, a Single Market: The Planet' ran during 2011-2015 with an annual budget of EUR 8 million. Funding was provided from the national budget, EU Funds and the private sector. The national programme for the creation of innovation clusters is planned to be re-launched in the current period 2014-2020.	2011-2015
	Under the Regional Operational Programme 'Attica 2014-2020'/Funding Priority: "Reinforcement of the competitiveness and extroversion of SMEs — Improving the attractiveness of the Attica region for investments and promoting innovative entrepreneurship", co-funded by the ERDF, a call for proposals was published in October 2018, entitled "Promoting Entrepreneurship through the creation of Innovation Clusters in Attica Region". The action, of total public expenditure of EUR 6.6 million, will support the creation of innovation clusters in the region of Attica, in sectors prioritized in the Regional Smart Specialisation Strategy, including Blue Economy and Creative Economy. The competitiveness of enterprises participating in clusters will be supported also through the aid scheme of the Greek Investment Incentives Law entitled "Synergies and Networking", under the General Block Exemption Regulation. Among the specific goals of the action are: reinforcement of export potential,	

[15] See also https://www.cget.gouv.fr/actualites/56-poles-de-competitivite-labellises-pour-la-phase-iv.

[16] 56 *pôles de compétitivité* were selected for the forth phase (2019-2022), see https://competitivite.gouv.fr/.

Country	Cluster Programme	Duration
	enhancement of regional competitiveness and support for the creation of technology consortia. The call for applications was launched in October 2018.	
Hungary	Pole Programme (2007-2010) Hungarian Cluster Development Programme (2010-) www.klaszterfejlesztes.hu	Conti-nuously since 2007
Iceland	Currently no cluster programme in place, but a cluster programme was implemented in the past. In addition, Iceland plans to develop a cluster programme in the near future. Iceland pursues other approaches to support clusters and runs cluster projects, information and knowledge services and the Icelandic Cluster Centre.	2 years
Ireland	Currently no cluster programme in place, but there are plans to develop a cluster programme in the future. Clusters are supported through regional funding, national innovation programmes etc.	
Italy	Competence Center http://www.sviluppoeconomico.gov.it/index.php/it/incentivi/impresa/centri-di-competenza	2017-2020
Latvia	Cluster programme https://em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/klasteru_programma/	2016-2020
Lithuania	The project 'Promotion and Development of Innovation Networking (INOLINK)' aims to stimulate integration of enterprises into clusters, to increase the maturity of clusters, and to promote growth and international cooperation https://mita.lrv.lt/en/projects/inolink and http://klaster.lt/en/	2016-2019
	Lithuanian Innovation Development Programme 2014-2020 (LIDP) https://mita.lrv.lt/en/national-r-d-programmes/innovation-policy-in-lithuania. The programme covers all issues related to state innovation policy; its third objective - to promote the development of clusters and integration in global value chains - is dedicated to clusters.	2014-2020
	Lietuvos Klasterių; koncepcija (Concept of the Development of the Lithuanian Clusters) is a guidance document. It is composed of the current state analysis of clusters, the benefits provided by clustering, the targets and tasks of cluster development, cluster members, levels of cluster development and monitoring of the promotion of clustering. https://ukmin.lrv.lt/uploads/ukmin/documents/files/Inovaciijos/klasteriai/%C5%AAM%202017-10-12%20%C4%AFsakymas%20Nr_%204-601%20D%C4%97l%20Lietuvos%20klasteri%C5%B3%20koncepcijos%20pakeitimo.pdf	
Malta	Currently no cluster programme in place, but there are plans to develop a cluster programme in the future. Clusters are indirectly supported through SME support, investment aid and R&D&I programmes. In addition, schemes and support mechanisms are developed to assist clusters in specific areas such as maritime industries, aviation, digital industries and design.	
Monte-negro	Program for stimulating the development of clusters in Montenegro (2 phases) http://www.mek.gov.me/organizacija/razvoj/javni_pozivi	2012-2016 2017-2020
	Improving the competitiveness of the economy in Montenegro	2017-2018

Country	Cluster Programme	Duration
Nether-lands	Currently no cluster programme in place, but cluster support is granted through other approaches: The Netherlands has designated 9 national clusters that are called Topsectors. Those clusters are not region-specific but national in character. However, some of these sectors have strong regional concentrations, like High Tech industries in the Eindhoven region.	
Poland	Currently more than 4 programmes in place. The most important are:	
	Internationalization of the Key National Cluster Programme http://poir.parp.gov.pl/poir233/poddzialanie-2-3-3-umiedzynarodowienie-krajowych-klastrow-kluczowych	2014-2020
	Krajowy Klaster Kluczowy http://www.pi.gov.pl/Klastry/chapter_95922.asp	2015-2018
Portugal	Competitiveness Cluster www.iapmei.pt /Clusters de Competitividade	2017-2023
Romania	Organization and development of innovative clusters https:/uefiscdi.ro/organizare-si-dezvoltare-cluster-cluster-inovativ-cls	2018-2020
	POC 2014-2020 Axis 1, Action 1.1.1, Project type: Innovative clusters www.finantare.ro/poc-2014-2020-actiunea-1-1-1-clustere-de-inovare.html	2018-2023
	POC/PI2.2/OS2.2/Action 2.2.1 Supporting the growth of added value generated by the ICT sector and innovation in the field through the development of clusters http://www.fonduri-ue.ro/apeluri/details/2/12/apeluri-poc-a-2-a-2-2-1-2015	2016-2019
Slovakia	Scheme to support industrial cluster organisations http://www.economy.gov.sk/uploads/files/VfSBDY7i.pdf	Since 2013
	There are plans to develop a cluster programme in the near future, and clusters are supported through the small grant scheme.	
Slovenia	SRIP - Strategic Research Innovation Partnerships http://www.svrk.gov.si/en/areas_of_work/slovenian_smart_specialisation_strategy_s4/strategic_research_and_innovation_partnerships_srip_in_detail/	1-7 years
Spain	Agrupaciones Empresariales Innovadoras http://www.ipyme.org/es-ES/Financiacion/AEI/Paginas/AEINueva.aspx	Annually
Sweden	Vinnväxt https://www.vinnova.se/en/m/vinnvaxt/	Conti-nuous since 2003
United Kingdom	'Strength in Places' Fund, focus on regions, building on their research and innovation strengths	Since 2017

Source: European Observatory for Clusters and Industrial Change, online survey on national cluster programmes 2018.[17]

[17] Sources of programme or Administration logos: https://www.bmdw.gv.at/Seiten/PageNotFoundError.aspx?requestUrl=https://www.bmdw.gv.at/Innovation/ClusterplattformOesterreich/Seiten/default.aspx; https://www.mpo.cz/cz/podnikani/dotace-a-podpora-podnikani/oppik-2014-2020/programy-podpory-op-pik/; https://ufm.dk/forskning-og-innovation/samspil-mellem-viden-og-innovation/viden-netvaerk-og-kommercialisering-til-

In most countries analysed, cluster programmes are conceived at the national level. In France, both the national and regional levels of intervention is of importance, while Germany and Poland conceive cluster programmes at the national, regional and interregional levels. This means that in addition to the national and regional levels of administration, cluster programmes are conceived in the interregional context, such as for instance within the European Territorial Cooperation/Interreg programmes. In Romania, the national and the interregional levels of administration are relevant levels for cluster programme support, while Montenegro focuses on the regional level of administration for the conception of cluster programmes.

Summary box on national cluster policies

The survey results show that European countries pursue different approaches to promoting clusters in their countries. Specific dedicated cluster programmes are in place in many countries, while cluster support is also integrated in the Operational Programmes of the European Structural and Investment Fund or other programmes. This indicates that cluster support has become an integral element of economic policy.

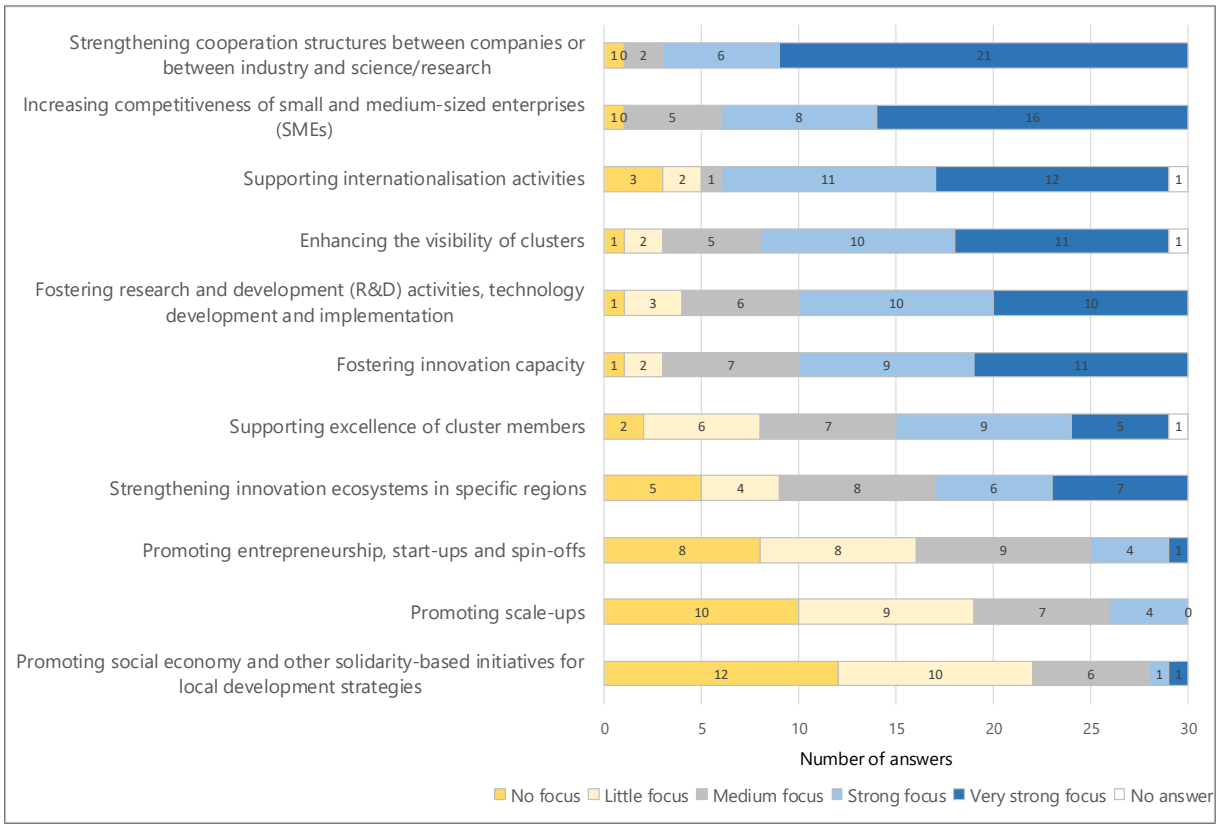
2.2 Objectives and focus of cluster programmes in Europe

In practice, cluster policy pursues different objectives to promote economic development. Figure 2 and figure 3 give an overview of the objectives addressed by

virksomheder/klynger-og-innovationsnetvaerk/innovationsnetvaerk; https://danishbusinessauthority.dk/; https://www.estonianclusters.ee/textpage/; https://competitivite.gouv.fr/; https://www.bmbf.de/de/kmu-netc-3244.html; https://www.bmbf.de/en/internationalisation-of-leading-edge-clusters-forward-looking-projects-and-comparable-1416.html; https://www.unternehmen-region.de/de/innovationsforen-mittelstand-1787.html; http://www.clusterpolisees3.eu/ClusterpoliSEEPortal/protected/2189/0/def/ref/DOC2187/; http://www.corallia.org/en/activity-fields/clusters.html; http://www.klaszterfejlesztes.hu/; https://www.mise.gov.it/index.php/it/incentivi/impresa/centri-di-competenza; https://em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/klasteru_programma/; http://klaster.lt/en/; https://mita.lrv.lt/en/national-r-d-programmes/innovation-policy-in-lithuania; http://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&cad=rja&uact=8&ved=2ahUKEwi0j5G22srgAhWHxIUKHZxHDsgQFjAEegQIBhAC&url=http%3A%2F%2Fklaster.lt%2Fwp-content%2Fuploads%2F2017%2F07%2FLietuvos-klasteriu-pl%25C4%2597tros-koncepcija_2014-02-27_Nr_4-131.docx&usg=AOvVaw0vkJBa3a3ApC_HTqNUEBzK; http://www.mek.gov.me/organizacija/razvoj/javni_pozivi; https://www.parp.gov.pl/component/grants/grants/Umi%C4%99dzynarodowienie%20Krajowych%20Klastr%C3%B3w%20Kluczowych; http://www.pi.gov.pl/Klastry/chapter_95922.asp; https://www.iapmei.pt/; http://www.finantare.ro/poc-2014-2020-actiunea-1-1-1-clustere-de-inovare.html; http://www.fonduri-ue.ro/apeluri/details/2/12/apeluri-poc-a-2-a-2-2-1-2015; https://www.economy.gov.sk/en/ministry; http://www.svrk.gov.si/en/areas_of_work/slovenian_smart_specialisation_strategy_s4/strategic_research_and_innovation_partnerships_srip_in_detail/; http://www.ipyme.org/es-ES/Financiacion/AEI/Paginas/AEINueva.aspx; https://www.vinnova.se/en/m/vinnvaxt/; and https://www.ukri.org/funding/funding-opportunities/strength-in-places-fund/.

national interventions to support clusters.[18] The importance of different objectives varies by country: the strengthening of cooperation structures among different types of actor - the basic conditions of clusters - ranks first, followed by SME competitiveness and internationalisation activities. As table 8 (annex B) shows, most of the cluster programmes in the countries analysed have set a number of different objectives.

Figure 2 - Objectives of national cluster programmes in Europe



Source: European Observatory for Clusters and Industrial Change, online survey on national cluster programmes 2018 (30 answers for 29 programmes)[19]

A large number of cluster programmes pursue between five and nine objectives, but there are also programmes that assign a high priority to a limited number of objectives. As the example of Poland shows, different programmes may target different objectives: while the programme "Krajowy Klaster Kluczowy" has a broad orientation towards cooperation, innovation, entrepreneurship and SME support, visibility and excellence, the programme "Internationalization of the Key National Cluster Programme" has a strong focus on internationalisation and visibility.

It is interesting to note the relative importance of internationalisation support of clusters - in contrast to the main advantages inherent to clusters in terms of spatial

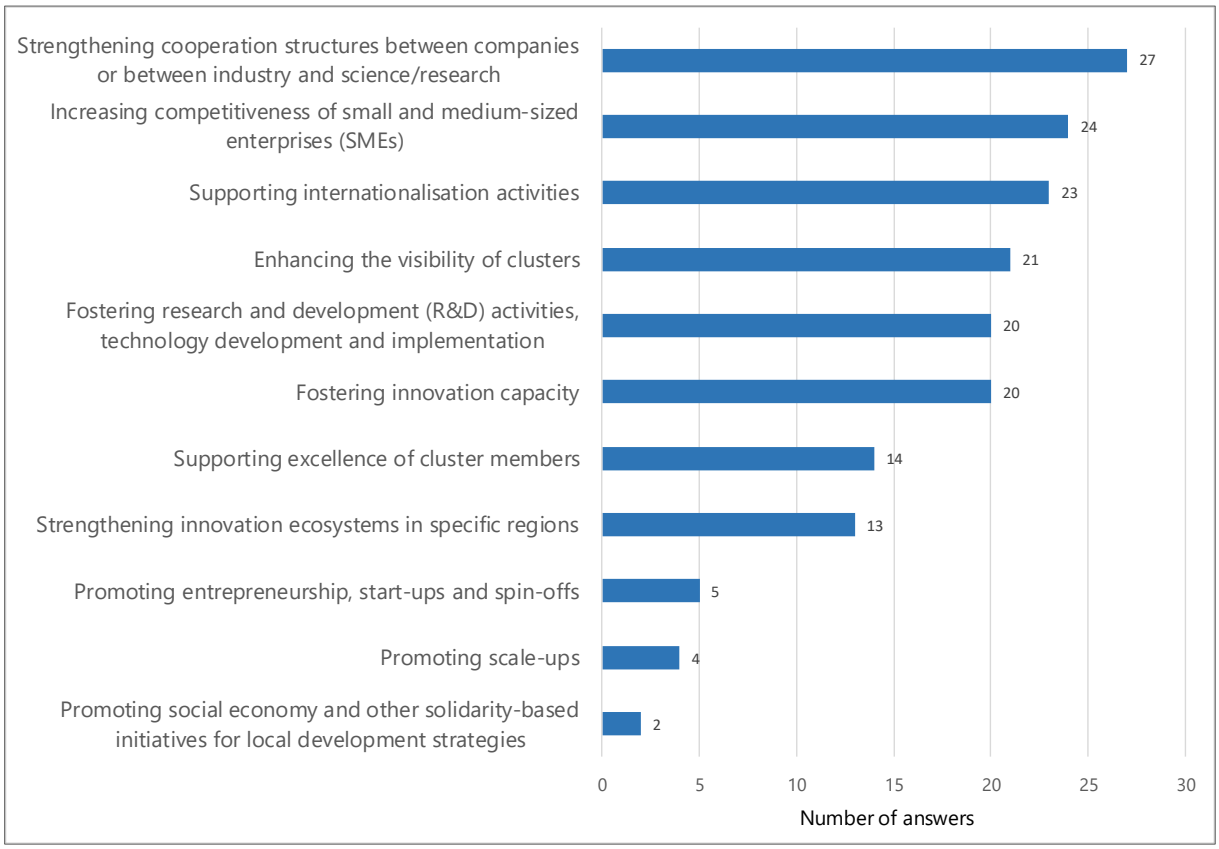
[18] The following analyses show the total number of assessments, including cases with more than one answer per country. See also annex A.

[19] in descending order "strong/very strong focus".

proximity. This shows that successful clusters are characterised by a concurrence of spatial proximity and connectedness with extra-regional partners. The German government for instance has implemented a special measure on the internationalisation of leading-edge clusters as a follow-up programme for the support to 15 high-end clusters (selected through the leading-edge cluster competition), and the Polish programme "Internationalization of the Key National Cluster Programme" mentioned above has a specific focus on internationalisation activities, too.

The promotion of entrepreneurship, scale-ups and the social economy are, on the other hand, currently underdeveloped objectives of national cluster programmes.

Figure 3 - Most important objectives of cluster programmes



Source: European Observatory for Clusters and Industrial Change, online survey on national cluster programmes 2018 (answers for 29 programmes)

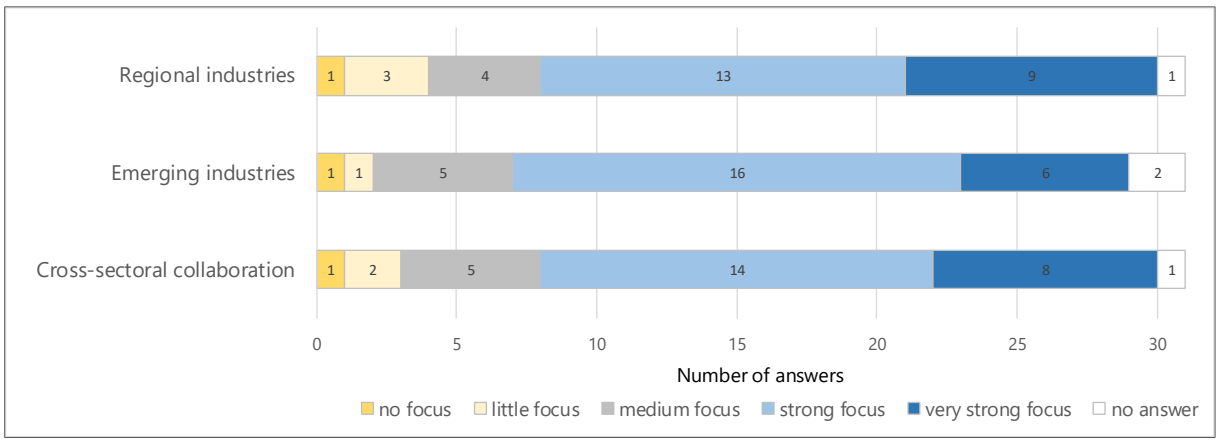
Objectives related to entrepreneurship/start-ups/spin-offs and scale-ups, as well as social economy and other solidarity-based initiatives, currently do not receive a high rank in the cluster programmes analysed. Looking more deeply into the objectives pursued by individual countries (table 8 in annex B) shows that there is a strong or very strong focus on social economy objectives in Montenegro (both programmes), while entrepreneurship/start-ups/spin-offs are considered an important objective in Germany (KMU-NetC), Montenegro (both programmes), Poland (Krajowy Klaster Kluczowy), and Romania (POC/PI2.2/OS2.2/Action 2.2.1). The support of scale-ups is

currently assigned a strong focus in France, Hungary, Poland (Krajowy Klaster Kluczowy), and Romania (POC/PI2.2/OS2.2/Action 2.2.1).

When specifically targeting the support of small and medium-sized enterprises, the cluster programmes listed put a strong emphasis on existing regional industries (strong/very strong focus; 22 answers) as well as emerging industries (22 answers) and cross-sectoral collaboration (22 answers; figure 4). Fourteen programmes assign a strong or very strong focus to all three aspects, while eight programmes focus on two of them. A specific focus on one type of industry is comparatively rare: the Lithuanian Innovation Development Programme 2014-2020 has a specific focus on emerging industries, while both programmes in Montenegro and the UK Fund target existing regional industries. The Greek cluster support has a strong focus on cross-sectoral collaboration.

In the vast majority of cases, cluster programmes that target clusters in emerging industries (table 8, annex B) also focus on these industries for the segment of small and medium-sized enterprises. Collaboration across sectors is also high on the agenda of cluster support for SMEs. Cluster programmes in Austria, Denmark, Estonia (Support for cluster development), France, Germany (all three programmes), Greece (two programmes), Italy, Latvia, Poland (both programmes), Portugal, Romania (all three programmes), Slovenia, Spain and Sweden assign this category a strong or very strong focus. This also applies to the Lithuanian project "Promotion and Development of Innovation Networking", INOLINK).

Figure 4 - Focus of national cluster programmes with regard to the support of SMEs



Source: European Observatory for Clusters and Industrial Change, online survey on national cluster programmes 2018 (31 answers for 30 programmes)

Summary box on the objectives and focus of national cluster programmes

The strengthening of cooperation structures between different types of actors within clusters, increasing competitiveness of SMEs and internationalisation activities are the most important objectives pursued by cluster programmes in the participating countries. Most cluster programmes have a rather broad focus and address several objectives, but the survey also reveals programmes that target a specific and limited set of objectives. In relation to SME support, existing industries in the region, emerging industries and cross-sectoral collaboration are considered of high importance in the cluster programmes of the sample countries.

2.3 Types of cluster targeted in national cluster programmes

Comparing the assessments of different types of clusters that are addressed in national cluster programmes reveals that clusters in emerging industries have a high or even very high importance, followed by the support for clusters in emerging technologies: 23 of the 30 programmes analysed target clusters in emerging technologies and/or industries. In most cases, both these emerging fields are jointly addressed (see also table 8, annex B). Considering that five further programmes target all types of cluster and two focus on innovative clusters, it is possible to conclude that practically all programmes are oriented towards innovative and emerging activities. In addition, some countries also target mature industries, i.e. industries which are in the mature phase of their lifecycle or which have already passed through the emerging and growth phases, and/or industries restructuring. Obviously, these countries pursue a mixed strategy, including the support of new technologies or industries as well as mature industries. Cluster programmes in Austria, the Czech Republic, Denmark, Estonia (Supporting cluster development; Support for cluster development), France, Germany (Innovation Fora SMEs), Greece (Focus on creative industries), Poland (Krajowy Klaster Kluczowy), Portugal, Romania (all three programmes), Slovenia, Spain and Sweden are examples of such a mixed strategy. This emphasises the high focus on new activities through newly emerging fields and at the same time on fields in which a high level of experience is available and which are the subject of restructuring, possibly paving the way for new activities to emerge in the future.

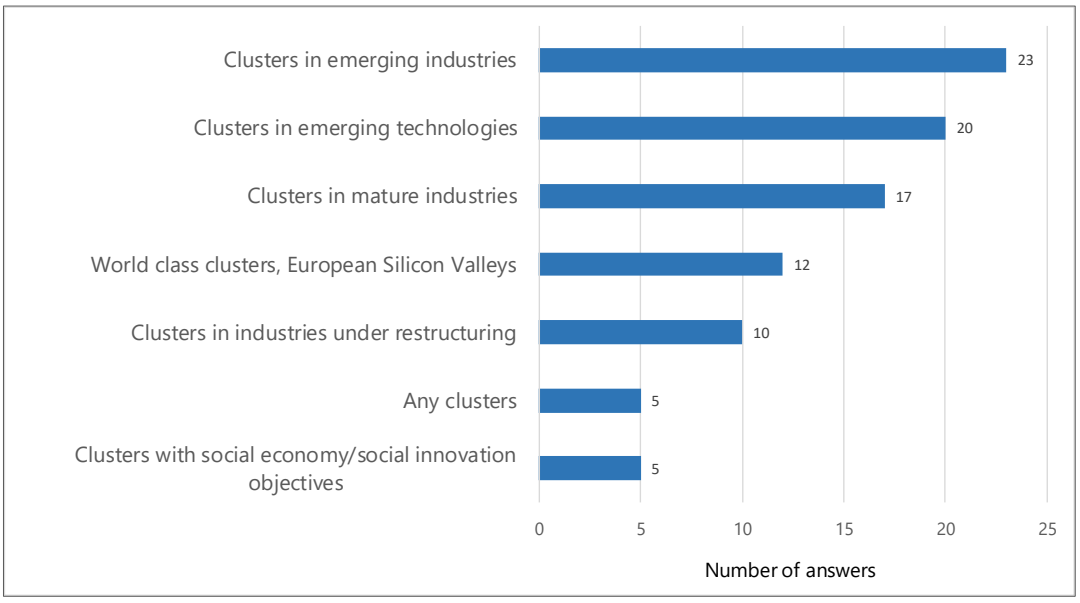
However, it is not possible to establish a relationship between the technological capability of a country and the thematic priorities of cluster programmes. In other words, the cluster programmes of technologically leading countries like Austria, Denmark or Sweden focus on both emerging technologies/industries and mature industries, while countries like Poland, Portugal, Spain or Romania are pursuing a similar approach. Some national cluster programmes have a specific sectoral or technological focus (table 8, annex B). The Estonian cluster programme is directed at

developing smart specialisation growth areas, while fields like bio-economy, ICT, energy and environment are targeted in Romania.

It is also not possible to establish clear connections between objectives, types of clusters targeted and the share of employment in industrial activities (figure 1, figure 2, table 8 in annex B). Specific cluster policy priorities in the different countries are a possible reason. In addition, other policy approaches like industrial policy may be more strongly directed towards the promotion of industrial sectors.

The support of world class clusters or European Silicon Valleys is particularly important in Austria, the Czech Republic, France, Germany (Internationalisation of Leading-Edge Clusters, Forward-Looking Projects and Comparable Networks; Innovation Fora SMEs), Greece (two programmes), Poland (both programmes), Romania (POC 2014-2020 Axis 1, Action 1.1.1), and Sweden. Clusters with social economy/social innovation objectives are currently targeted by a small number of cluster programmes (Austria, Germany - KMU-NetC and Innovation Fora SMEs, Greece (support for creative industries), and the United Kingdom; see also figure 5). This is consistent with the ranking of the social economy objective in national cluster policies (see figure 3).

Figure 5 - Most relevant types of clusters targeted in national cluster programmes



Source: European Observatory for Clusters and Industrial Change, online survey on national cluster programmes 2018 (answers for 30 programmes; multiple answers were possible)

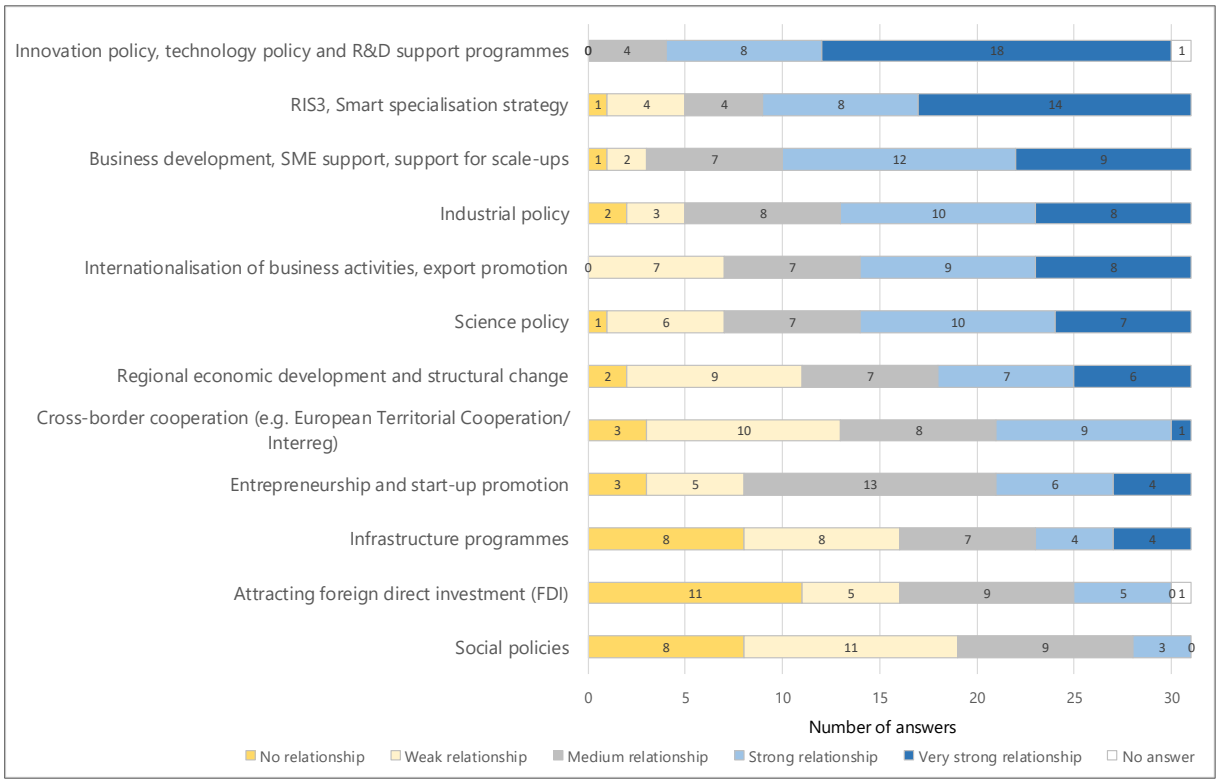
Summary box on types of cluster targeted by national cluster programmes

Most cluster programmes target clusters in emerging industries and/or technologies, but clusters in mature industries or in industries restructuring also receive considerable attention. Various countries target both types of cluster in their programmes, leading to the conclusion that these countries pursue a mixed strategy towards new activities on the one hand, and on existing activities on the other hand.

2.4 Relationship between national cluster programmes and other policies and programmes

The national experts were asked to assess the relationship of national cluster programmes to other policies or programmes. The most important policies mentioned (assessed as having a strong or very strong relationship with cluster programmes) were innovation-, technology- and R&D-supporting policies, policies in support of Smart Specialisation Strategies, and policies supporting private businesses including SMEs and scale-ups (figure 6). Cluster policy is an integral part of the whole policy mix in most of the countries, which underlines its function as a cross-cutting innovation policy tool. A weaker relationship can be observed for support policies such as attracting foreign direct investment (FDI), social policies, infrastructure policies or entrepreneurship and start-up promotion. The likely reason is that in most countries these policy fields are addressed by separate measures. However, as can be observed in many other programmes, cluster support frequently includes various objectives.

Figure 6 - Relationship of national cluster programmes to other policies or programmes



Source: European Observatory for Clusters and Industrial Change), online survey on national cluster programmes 2018 (31 answers for 30 programmes)[20]

[20] in descending order "strong/very strong relationship".

The relationship with the main objectives presented above are quite obvious: the more objectives, the stronger the relationship of cluster programmes to other policy programmes.

Summary box on the relationship of national cluster programmes to other programmes

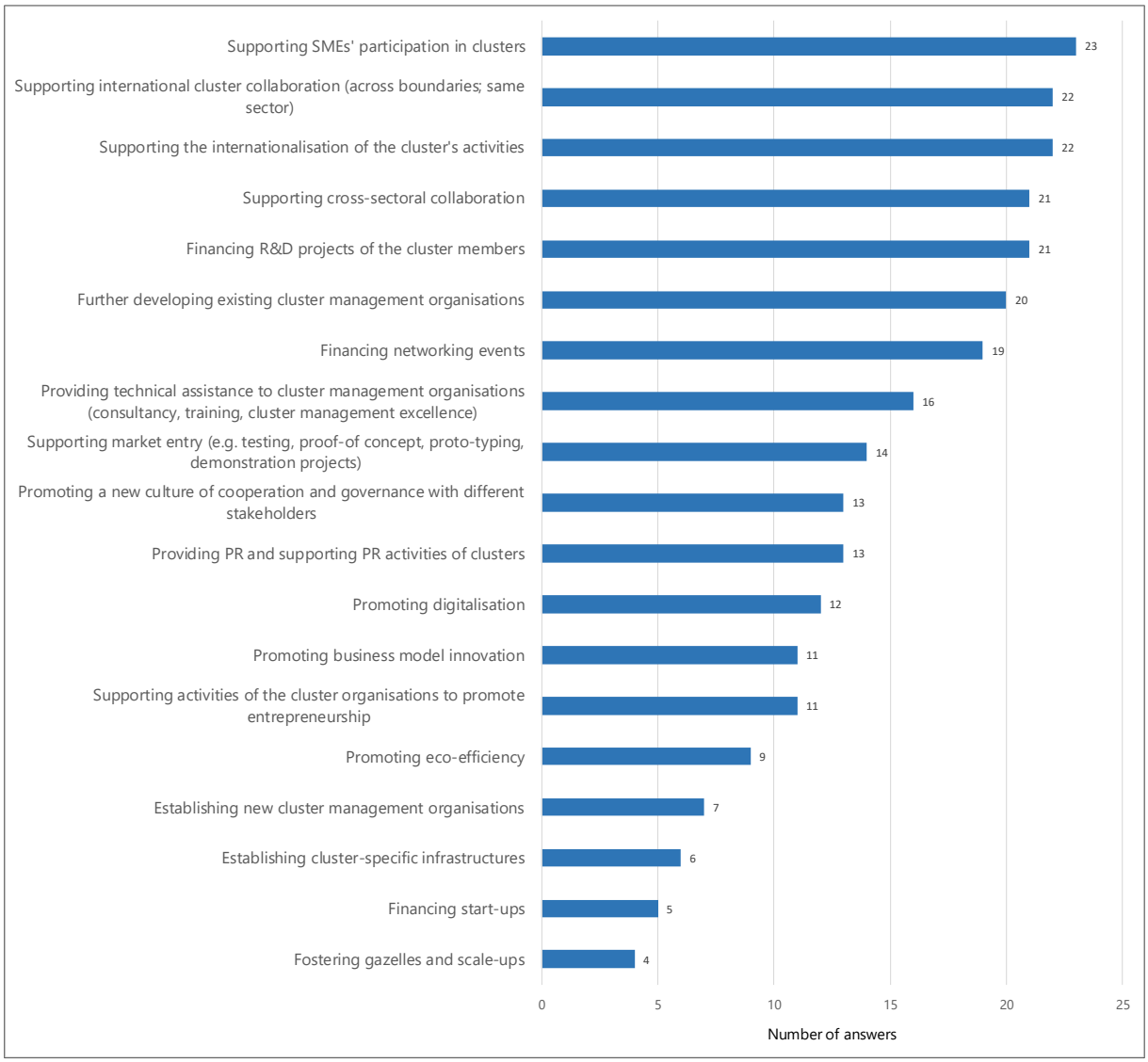
Cluster programmes in the countries investigated are most strongly related to innovation and technology policies, and R&D support, as well as to Smart Specialisation Strategies and business development, including support for SMEs and scale-ups. This underlines the strong relationship of cluster policy to innovation support, business development and the territorial implication of clusters. The high relationship with supporting small and medium-sized enterprises and scale-ups shows the importance that cluster policy attributes to creating favourable conditions for small and growing firms and their business activities.

2.5 Measures to support clusters in national cluster programmes

Looking at the concrete measures which are implemented within the national cluster programmes, the following figure shows that the most important measures relate to support for SME participation in clusters, international cluster collaboration, internationalisation of the cluster's activities, cross-sectoral collaboration, the financing of cluster members' R&D projects, and the further development of cluster organisations (see figure 7). These measures were indicated in at least 20 answers. Measures that are less important relate to fostering gazelles and scale-ups, the financing of start-ups, establishing cluster-specific infrastructures, establishing new cluster-management organisations or the promotion of eco-efficiency (fewer than ten "high/very high importance" assessments). It is likely that more focused measures are in place in some cases, especially for the financing of start-ups and the fostering of gazelles, rather than targeting these within the context of cluster support (e.g. separate entrepreneurship support or programmes focussing on the provision of venture capital for early-stage/high-risk companies).

The cluster programmes analysed provide different types of support, the most important being grants (23 answers), training of cluster managements (13 answers), and networking or partnership building (13 answers). Technical assistance is cited 11 times, and financial instruments, such as loans or guarantees, are mentioned 4 times. Further types of support delivered in individual countries are trend monitoring, specific services (export advice, training, coaching), capital contributions (national co-funding), donation, coaching and evaluation, as well as infrastructure and investment.

Figure 7 - Measures important for supporting clusters in national cluster programmes



Source: European Observatory for Clusters and Industrial Change, online survey on national cluster programmes 2018 (answers for 29 programmes)

Summary box on measures to support clusters in national cluster programmes

The most important measures for supporting clusters and their activities relate to fostering SME engagement in clusters, research and development activities, and internationalisation both of activities within clusters and of clusters as a whole. In summary, clusters focus on broadening their range of actors, particularly SMEs, and on expanding their activities beyond national borders. This is highly consistent with the objectives of the cluster programmes surveyed.

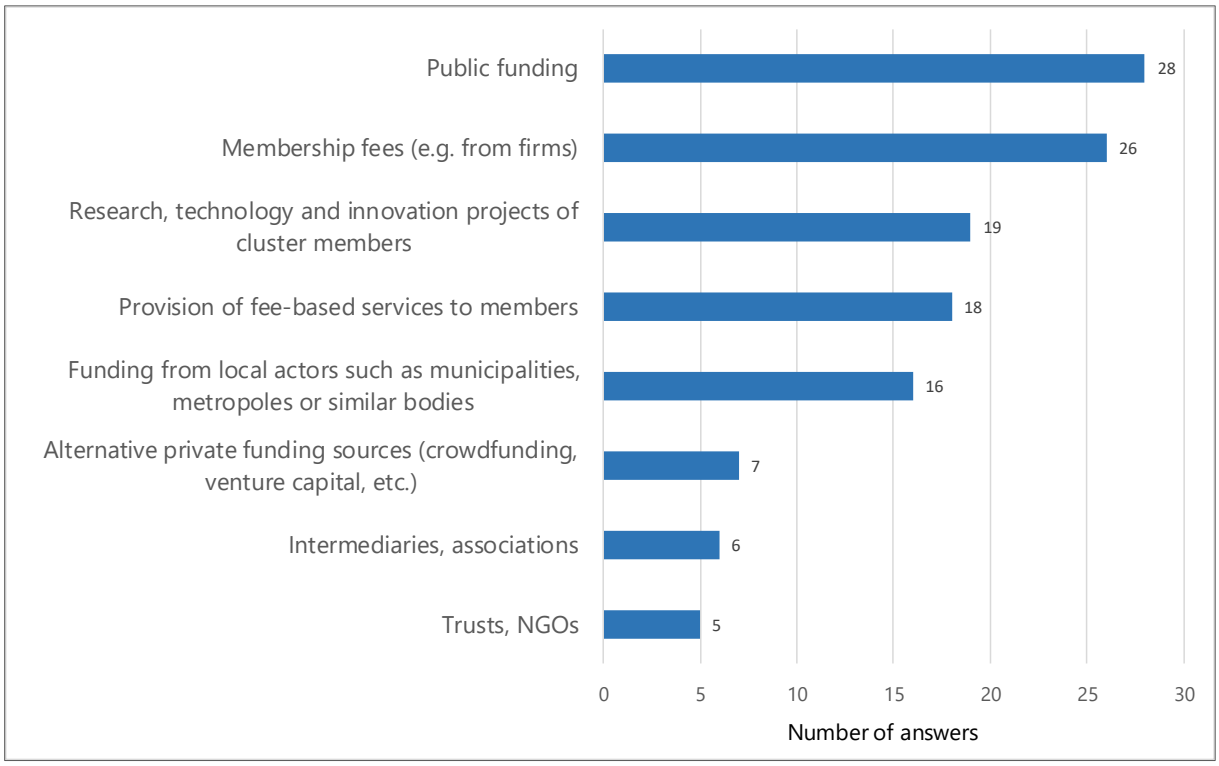
2.6 Funding and implementation of national cluster programmes

Eighteen of the 30 cluster programmes are funded by more than one source, while 12 programmes have one specific source of funding. In most cases, funding of cluster programmes originates from the national budget (20 programmes) and EU Funds such as the European Structural and Investment Funds (ESIF) (19 programmes). However, the private sector is of strong importance too (13 programmes) and in 8 cases, earnings from previous cluster activities contribute to the funding of current cluster programmes. This last was mentioned for cluster programmes in Estonia (The development programme of clusters), Germany (Internationalisation of Leading-Edge Clusters), Greece (support for creative industries), Poland (Internationalization of the Key National Cluster Programme), Romania (all three programmes) and Sweden.

As can be seen in table 8 (of annex B), the annual budget for cluster programmes varies considerably in the sample countries. It ranges from small amounts to an annual budget of up to EUR 144 million in France for the *Pôles de Compétitivité* programme, EUR 69 million (direct and indirect support) in Hungary, EUR 57 million in the UK for the Strength in Places Fund, and EUR 45 million in Germany for different programmes (including the international support follow-up to the leading edge-clusters that were allocated EUR 600 million between 2008-2017).This obviously depends on the range of objectives and activities addressed by the programme as well as the number of actors and initiatives the programmes intend to address.

The funding of cluster organisations generally originates from various sources. Among them, public funding is the most important, but membership fees are also a crucial source of financing for cluster organisations (figure 8). The research, technology and innovation projects of cluster members, fee-based services and funding from local actors are also mentioned frequently. Further private sources, intermediaries/associations, funding from trusts and non-governmental organisations (NGOs) receive lower rankings. Further funding sources such as private co-funding, employee placement from cluster members, direct EU programmes (COSME, Horizon2020, Interreg...), and foreign business associations funds are also mentioned. The high relevance of membership fees - in terms of the number of answers - indicates the strong pertinence of cluster support for the clients. However, there are only a few examples of cluster organisations which are completely financed by private actors.

Figure 8 - Sources of financing of cluster organisations



Source: European Observatory for Clusters and Industrial Change, online survey on national cluster programmes 2018 (answers for 30 programmes; multiple answers were possible)

Twenty-two of the 30 programmes are implemented by one or several national ministries. In some cases, the national ministry cooperates with a further body (generally an implementing or cluster agency organised under a ministry or a project management agency) to put the programme in practice.[21] In some cases (Hungary, Italy), dedicated units or technical committees in ministries are mentioned. Implementation of both the Danish and Polish programmes falls to a cluster agency organised under a ministry. An agency organised under a ministry implements *Vinnväxt* in Sweden, and Enterprise Estonia - the government organisation responsible for the development and growth of enterprises - is in charge of the cluster programmes Support for cluster development and Supporting cluster development in Estonia. The French *Pôles de Compétitivité* programme is implemented by national ministries and the regional authorities.

The survey sample shows up the high degree of collaboration between cluster organisations and the government or governmental institutions: 26 answers for programmes confirmed that cluster organisations are included in consultations with

[21] This approach is chosen in the Czech Republic, Estonia (The development programme of clusters), Germany (all three programmes) and Lithuania (Lithuanian Innovation Development Programme 2014-2020). The programme Improving the competitiveness of the economy in Montenegro is implemented by a national ministry and the United Nations Development Programme.

government bodies. The fields of activity vary between countries and programmes. Answers range from sharing good practice and experience to involvement in dedicated topics and strategy development (Smart Specialisation Strategy, sectoral policy), involvement in regional and national institutions, joint reflections on improving existing supporting programmes, as well as meetings, workshops, conferences and specific activities such as foresight. The high level of involvement of cluster organisations in consultations with government bodies emphasises the interrelationship between the strategic and operative levels, and the importance of exchanges between programme owners and users.

Summary box on funding and implementation of national cluster programmes

Most cluster programmes rely on multiple funding sources. The public sector is of high importance, but private funds are also significant. Cluster organisations also frequently use various sources to fund their activities. Though public funding ranks first, membership fees also finance a significant part of cluster organisations' activities. When it comes to the implementation of cluster policies, national ministries play a crucial role, partly in cooperation with further units or agencies. In general, the countries surveyed pursue individual approaches to implementing their cluster programmes. The degree of consultation between governments and cluster organisations confirms the high level of interaction between the strategic and operative levels of cluster support.

2.7 Target groups of national cluster programmes

Table 3 gives an overview of the different organisations that are targeted by national cluster programmes and that can apply for funding. Cluster organisations rank highest among the targeted groups (highlighted in 23 programmes by the respondents), followed by research institutions (fourteen programmes), SMEs (thirteen programmes) and business associations (twelve programmes). Large firms are targeted by 12 and academic institutions are targeted by 11 programmes. These business and research-related actors are obviously crucial in implementing cluster policy programmes.

Depending on the concrete measures applied (e.g. joint R&D programmes complementary to the funding of a cluster management organisation), different types of firms are among the target groups. For instance, SMEs, large companies and start-ups can apply for funding from Italy's Competence Center programme. The same goes for the cluster programme in Denmark, Spain, the French *Pôles de Compétitivité*, the Greek programmes as well as the German KMU-NetC and Internationalisation of Leading-Edge Clusters, Forward-Looking Projects and Comparable Networks, and the Lithuanian Innovation Development Programme 2014-2020. Academic institutions and universities are important target groups in the German programmes as well as in Denmark, France, Greece, Italy, Lithuania (Innovation Development Programme 2014-

2020), Spain and Sweden. In general, some programmes are oriented towards one specific type of actor (cluster organisations), while others target multiple types or consortia of different actors. Cluster programmes in the Czech Republic, Latvia, Lithuania (Project Promotion and Development of Innovation Networking, INOLINK), Poland (both programmes), Romania (Organization and development of innovative cluster; POC 2014-2020 Axis 1), and Slovakia belong to the first group. Considering the objectives of these programmes reveals that enhancing the visibility of clusters and supporting excellence of cluster members receive higher positions compared to the whole sample. The conclusion can thus be drawn that these programmes have a stronger focus on cluster profiling, while programmes in Denmark, France, Germany, Greece, Italy, Lithuania (Innovation Development Programme 2014-2020) and Spain that target business and research actors, pursue the objectives of strengthening cooperation between companies and between industry and research, as well as fostering research, development and technology, amongst others.

Summary box on the target groups of national cluster programmes

Some cluster programmes specifically address targeted actors - mostly cluster organisations - while others are directed towards various private or public types of stakeholders, for instance different types of private firms, research and/or academic institutions, and/or cluster organisations. This underlines the objectives of cluster programmes: fostering cooperation between cluster members, R&D and innovation activities, and SME support.

Table 3 - Target groups of national cluster programmes

Country	Cluster Programme	Cluster organisation	SMEs	Large firms	Start-ups	Business associations, inter-mediaries	Research institutions, Science and technology parks	Academic institutions, universities	Other /comments
Czech Republic	Cooperation Clusters	X							
Denmark	Innovation Networks	X	X	X	X		X	X	*Innovation networks may be hosted by cluster organisations.*
Estonia	Supporting cluster development					X			*NGOs*
	Support for cluster development	X				X	X		
	The development programme of clusters								*NGO or Foundations who represents clusters*
France	Politique des pôles de compétitivité	X	X	X	X		X	X	*Cluster organisation funding: pôles only. Dedicated calls for R&D project funding: consortia of SMEs, large firms, start-ups, research institutions, academic institutions, universities*
Germany	KMU-NetC	X	X	X	X	X	X	X	
	Internationalisation of Leading-Edge Clusters, Forward-Looking Projects and Comparable Networks (Clusters - Networks - International)	X	X	X	X	X	X	X	
	Innovationsforen Mittelstand (Innovation Fora SMEs)	X	X		X	X	X	X	
Greece	Support for creative industries	X	X	X	X		X	X	
	Support for space technologies, creative industries, micro-nano technologies	X	X	X	X		X	X	
Hungary	Hungarian Cluster Development Programme	X	X	X			X		*Beneficiaries of calls for proposals:* • *Management organisations of clusters with at least 3 years track record;* • *Members of Accredited Clusters, especially for SMEs and R&D&I projects*
Italy	Competence Center		X	X	X		X	X	*The different actors should aggregate in order to constitute a Competence Center*
Latvia	Cluster programme	X							

Country	Cluster Programme	Cluster organisation	SMEs	Large firms	Start-ups	Business associations, inter-mediaries	Research institutions, Science and technology parks	Academic institutions, universities	Other /comments
Lithuania	Project "Promotion and Development of Innovation Networking (INOLINK)"	X							
	Lithuanian Innovation Development Programme 2014-2020	X	X	X	X	X	X	X	*Agency organised under the Ministry (Agency for Science, Innovation and Technology)*
Montenegro	Program for stimulating the development of clusters in Montenegro (2 phases)	X				X			
	Improving the competitiveness of the economy in Montenegro	X				X			
Poland	Internationalization of the Key National Cluster Programme	X							
	Krajowy Klaster Kluczowy	X							
Romania	Organization and development of innovative clusters	X							
	POC 2014-2020 Axis 1, Action 1.1.1, Type project: Innovative clusters	X							
	POC/PI2.2/OS2.2/Action 2.2.1 Supporting the growth of added value generated by the ICT sector and innovation in the field through the development of clusters		X	X		X			
Slovakia	Scheme to support industrial cluster organisations	X							
Slovenia	SRIP - Strategic Research Innovation Partnerships	X	X	X		X	X		
Spain	Agrupaciones Empresariales Innovadoras	X	X	X	X	X	X	X	
Sweden	Vinnväxt	X				X	X	X	
United Kingdom	Strength in Places Fund, focus on regions building on their research and innovation strengths								*Consortia of the mentioned actors*

Source: European Observatory for Clusters and Industrial Change, online survey on national cluster programmes 2018 (answers for 30 programmes; multiple answers)

2.8 Support for further cluster development

Cluster programmes are not a particularly new phenomenon; in many countries (and regions) the first were implemented years ago. Against this background and the fact that most of the cluster instruments can be regarded as "standard", the question arises as to how existing programmes can develop further in terms of improving their impact and addressing further needs and challenges articulated by cluster members. In the course of the survey, national cluster experts were asked which initiatives for the further development of cluster programmes they would consider helpful.

By looking at the results (table 4), it is possibly first of all to conclude that most of the categories given in the questionnaire proved to be highly relevant. Of significant importance (between 15 and 20 "high/very high importance" assessments from 18 countries) are: funding for R&D/innovation funds, events for cluster matchmaking with clusters in Europe, information on promoting new industrial activities, training for cluster management, information on improving framework conditions for cluster development, information on promoting business model innovation, providing information on clusters in Europe, providing information on clusters beyond Europe, developing skills and human resources, and information on promoting digitalisation.

According to the respondents, further development of cluster programmes would benefit from support for innovation and related activities (research and development, digitalisation, skills and human resources), as well as from the provision of information on clusters both within and outside Europe and on framework conditions, as well as matchmaking events and training for cluster managements. These results even take on added importance when considering that all answers to the question on the future importance of cluster programmes confirm that kind of support will be of equal or increased importance in the future.

Summary box on support for further cluster development

All participants in the cluster programme survey stated that cluster programmes will maintain or increase their importance in the coming years. This leads to the conclusion that the participating countries are convinced of the success of their cluster policies. A broad variety of helpful initiatives for further developing national cluster programmes was mentioned, of which the most important related to support for innovation, technology and human resources, as well as information provision, training and matchmaking events.

Table 4 - Measures to support the development of cluster programmes

Country	Events for cluster matchmaking with clusters in Europe	Events for cluster matchmaking with clusters beyond Europe	Access to markets including international markets	Providing information on clusters in Europe	Providing information on clusters beyond Europe	Information on the upgrading and upscaling of industries and firms	Information on promoting new industrial activities	Information on promoting business-related service sectors	Information on improving framework conditions for cluster development	Information on start-up support within the cluster	Developing skills and human resources (e.g. higher education,	Information on providing physical infrastructure (e.g. business incubators, technology parks, ICT)	Funding for R&D/innovation funds	Information on promoting digitalisation	Information on promoting business model innovation	Training for cluster management
Austria	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0
Czech Republic	+	+	+	+	+/0	+	+	-/+	+	0/+	-/+	0/-	+	0/-	-/+	+/0
Denmark	0	0	-	+	+	0	0	0	0	0	+	-	+	0	0	+
Estonia	+	+	+	0/+	0/+	-/+	+	+	+	-/+	+	-/+	+	+	+	+
France	+	0	0	+	+	0	0	0	+	0	0	+	+	+	+	0
Germany	+	+	0	+	+	0	+	+	+	+	+	0	+	+	+	+
Hungary	+	0	0	0	+	+	+	+	+	+	+	0	+	+	+	+
Italy	+	+	+	+	+	0	+	+	0	0	+	+	+	+	+	+
Latvia	+	0	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Lithuania	+	0/+	+	+/0	0/+	0	+	0	+/-	0/+	+	+	+	+	0/+	+
Montenegro	+	+	0	+	0	+	+	+	+	+	+	+	0	+	0	+
Poland	+	+	+	0/+	+	0/+	+	0/+	0/+	+	0/+	0/+	+	0/+	+	+
Portugal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Romania	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Slovakia	0	-	-	0	-	-	0	-	0	-	0	-	-	-	-	0
Slovenia	+	+	+	0	0	+	0	0	0	-	+	0	+	+	+	+
Sweden	0	0		+	+	+	+	+	+	0	0	0	+	0	+	+
United Kingdom	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-

Source: European Observatory for Clusters and Industrial Change, online survey on national cluster programmes 2018 (22 answers for 18 countries). +: high/very high importance, 0: medium importance, -: no/little importance, "./.": different assessments for one country.

2.9 Main findings and comparison with the 2015 survey of cluster programmes

The preceding sections provide information on current cluster policies in European countries, based on an online survey to stakeholders in charge of designing and implementing cluster policies. In total, this report delivers information on the support of clusters in 29 countries, including in-depth information on 30 cluster programmes in 20 countries. The analysis shows that a variety of initiatives is in place to support clusters across Europe. Many countries are implementing dedicated cluster programmes, but some countries integrate cluster support in other programmes, mainly Operational Programmes under the Structural Funds investments of the European Union, but also in programmes for business or sectoral support.

Focusing specifically on dedicated programmes designed to support clusters, the analysis reveals that strengthening of cooperation structures, increased SME competitiveness and internationalisation activities are the most important objectives of cluster programmes in the countries analysed. Most programmes pursue a set of several objectives, but some programmes focus on a limited set of specific objectives. The majority of cluster programmes targets clusters in emerging industries and/or emerging technologies. But mature clusters and clusters in industries which are restructuring are also frequently targeted, often in addition to emerging industries or technologies. This leads to the conclusion that a mixed strategy is pursued, which targets both new and mature industrial activities. Where clusters are specifically oriented towards small and medium-sized enterprises (SME), existing industries in the region, emerging industries and cross-sectoral collaboration receive high attention.

Cluster programmes in the countries analysed are most strongly related to innovation and technology policies and R&D support, as well as to Smart Specialisation Strategies and business development, including support for SMEs and scale-ups. These relationships with innovation support, business development and regional specialisation strategies indicate that cluster policy is an integral element of the nation-specific policy-mix. Accordingly, the most important measures for cluster support refer to the engagement of SMEs, research and development, and internationalisation.

Embedded in the specific governance setting of each country, cluster programmes are implemented by a broad range of actors. In most cases, cluster organisations are invited to participate in government consultations. The respective national budgets and the range of stakeholders targeted vary between the countries. Though the public sector is highly pertinent for funding cluster activities, private funds also turn out to be important. All participants in the national cluster programme survey stated that cluster programmes will maintain or even increase in importance in the future. Against this background, a broad range of activities are seen to support further development of

clusters. Provision of information and matchmaking occur frequently, as do funding for research and development. The development of skills and human resources, and training for cluster management are also rated very highly.

Comparing the main findings with the cluster programme survey of the previous European Cluster Observatory, conducted in 2015[22] makes it possible to infer some trends in the medium term perspective, even though it should be borne in mind that the participating countries - and thus the analysed cluster programmes - are not identical in both surveys.

The stocktaking exercise presented in this report clearly shows the variety of cluster supporting initiatives that are in place in the countries analysed, as mentioned above. Already in the previous analysis from 2015, it was possible to discern a trend towards linking cluster support to regional development and innovation. In line with this finding, both the 2015 and 2018 surveys show a high connection of cluster policies with national and regional innovation and specialisation strategies.

Taking the countries with a dedicated cluster programme in place, a distinction can be made between broad approaches that embrace various facets of cluster activities, and rather focused approaches with specific objectives and target groups. Most cluster programmes target cluster organisations, but in some cases such as the Czech Republic, Latvia, Lithuania (Promotion and Development of Innovation Networking Project, INOLINK), Poland (both programmes), Romania (Organisation and development of innovative cluster; POC 2014-2020 Axis 1) and Slovakia, cluster support specifically targets this type of actor, while in other countries, cluster organisations are among a wide variety of actors that are targeted by cluster programmes. Cluster organisations were also highlighted as key actors of cluster programmes in the 2015 analysis: "Many cluster programmes provide separate budgets for specific support activities of cluster managements." [23] Thus, cluster organisations remained an important target group over time.

Comparing these findings with those mentioned in the 2015 survey shows that some cluster programmes are implemented in at least a medium-term perspective. In Austria, the Czech Republic, Denmark, France, Portugal and Sweden, the programmes mentioned in the previous survey are still in place. The Leading Edge Cluster Competition of the German Federal Ministry of Education and Research mentioned in

[22] European Commission (ed.) (2015): Cluster Programmes in Europe. Report, European Cluster Observatory. Prepared by Dr. Gerd Meier zu Köcker, Lysann Müller, VDI/VDE-IT, https://ec.europa.eu/docsroom/documents/12925/attachments/1/translations/en/renditions/pdf.

[23] European Commission (ed.) (2015): Cluster Programmes in Europe. Report, European Cluster Observatory. Prepared by Dr. Gerd Meier zu Köcker, Lysann Müller, VDI/VDE-IT, https://ec.europa.eu/docsroom/documents/12925/attachments/1/translations/en/renditions/pdf, page 29.

the previous survey was succeeded by the Internationalisation of Leading-Edge Clusters programme that is included in the 2018 survey. In Bulgaria and Romania, cluster support is related to Operational Programmes, which is evident in both surveys.

In countries that operate cluster programmes, these frequently have a dedicated focus such as cluster cooperation, internationalisation, innovation support, etc. This shows that the development and specific orientation of cluster evolution receives priority over the establishment of new clusters. In terms of cluster programme objectives, the strengthening of cooperation between different types of actor - as basic conditions for clusters - receives the highest priority. Interestingly, and as also shown in the 2015 survey, internationalisation activities prove to be of high pertinence. These findings confirm the relevance of cluster support for improving cluster-internal interrelationships, market success and - in addition - the relationship with international activities. In various cases, cluster programmes do not exclusively focus on supporting strong cluster structures, but also on pursuing a set of additional objectives. Cluster support is thus used as a vehicle to promote further policy objectives, such as increasing the competitiveness of small and medium-sized enterprises.

In fact, there is a clear shift in the focus of cluster programmes with regard to SME support: while regional industries clearly ranked first in the 2015 survey and emerging industries were regarded as of a rather medium importance, this latter category proved to be of equal importance in 2018 (measured in terms of strong/very strong focus), closely followed by cross-sectoral collaboration. This indicates that the assessment and focus of emerging industrial activities seems to have gained in importance during the last years.

Strengthening cooperation structures between companies or between industry and science/research is shown to be the most important objective of cluster programmes, while innovation and technology policies and R&D support are the most pertinent policies related to cluster programmes. Of the 26 programmes that pursue the objective of strengthening cooperation structures within clusters, 23 also mention a strong or very strong relationship of the programme to RTDI policies. This finding is consistent with the fact that the support for SME participation in clusters and the funding of cluster members' R&D projects are among the most important measures for supporting clusters, in addition to supporting internationalisation activities and international cluster collaboration. This is also comparable to the findings of the 2015 survey that revealed a strong relationship between cluster programmes and R&D/innovation as well as business development/SME support policies.

The 2015 survey showed that the majority of programmes analysed at that time include technical assistance components: of 21 (national and regional) programmes analysed at that time, 18 included funding instruments, while 16 provided technical assistance.

The recent 2018 survey emphasises grants as the most important type of support provided by cluster programmes. Both the 2015 and the 2018 surveys show that individual programmes do not provide public funding. In 2015, the German programme "go-cluster" - offering technical support and advice - was mentioned in this connection, while the example of Northamptonshire in the 2018 regional survey (see chapter 3) shows that cluster support is exclusively based on private funding.

Currently, training of cluster managements and networking or partnership-building measures rank even higher than technical assistance (this includes non-financial support, such as public relations or consultancy activities). The social economy and scale-ups are currently less high on the agenda of cluster programmes. However, some cluster programmes include these activities in their portfolio of objectives or supporting measures. It remains to be seen whether these aspects will gain in importance in the coming years.

There has been a certain shift in priorities between 2015 and 2018 in the clusters targeted by national cluster programmes. Clusters in emerging industries evolved from second highest priority to the highest, while mature clusters lost ground during this period. Most interestingly, world class clusters that ranked second in 2015 dropped back to fourth in 2018. However, these findings need to bear in mind the differences in the samples and the number of cases analysed.

As in the 2015 survey, the further development of existing cluster organisations is regarded as a higher priority in the 2018 survey than the establishment of new ones. This shows that most countries have established an adequate set of organisations that are now focusing on their further development.

When it comes to the funding of cluster programmes, public national and/or European sources are of high importance in 2018. However, private sector funding as well as revenues from previous activities should not be overlooked. The annual budgets of the cluster programmes also show a high variation - similar to the survey conducted in 2015. It can be assumed that this is related to the range of clusters addressed and the number of actors eligible for support, which is also connected to the size of the country. Finally, and in accordance with the main fields of interest of cluster programmes, there is a range of initiatives that the respondents consider helpful for the development of cluster programmes at the national level. The assessment of high or very high importance is most often assigned to funding for R&D/innovation, cluster matchmaking within Europe, the provision of information on supporting new industrial activities, and training for cluster management. Further supportive measures also rank high on the agenda as table 4 shows. This underlines the high interest in cluster programmes and in supportive measures to further develop cluster programmes in European countries.

3 Cluster support in European regions

This chapter presents the results of the survey on cluster programmes in selected European regions.

While the previous chapter provided a fairly comprehensive overview of national cluster policies and programmes, this chapter offers a similar partial overview at the regional level on the basis of the 49 regions that provided a response to the survey. This makes an overview possible of the objectives, types, implementing measures and target groups of regional programmes, but it does not provide a full overview of all regional cluster programmes across Europe.

To get a better view of the extent of cluster programmes at the regional level, it is possible to turn to a previous survey by the European Cluster Observatory in 2008 that identified a total of 88 regional cluster programmes – i.e. covering about a third of Europe's regions. Moreover, the ESIF viewer[24] that visualises investments planned under the European Structural and Investments Funds can also give a context in terms of scale. It shows that EUR 2.32 billion were foreseen by Europe's regions for the category of intervention (063) of "Cluster support and business network support primarily benefitting SMEs" in the period of 2014-2020.

In order to provide a high degree of comparability of the information obtained at both the national and the regional levels, the survey to European regions used the core questions from the survey on national cluster policies (see chapter 2 of this report). However, some modifications were introduced in order to better adapt the survey to the regional situation. In addition, general questions on clusters and economic conditions were added. These questions were designed to obtain a deeper insight into the economic conditions in the regions as well as assessments on the advantages of cluster membership.[25]

3.1 Regional strategies to support clusters: overview

Comparable to the national part of this analysis, the chapter on regional cluster policies starts with a short overview on the economic conditions in the 49 regions that provided information on their cluster support. Due to different governance levels in charge of

[24] S3platform.jrc.ec.europa.eu/esif-viewer.

[25] The results are integrated in section 3.1. Further methodological details are given in annex A of this report.

cluster policies in the different European countries, the regional analysis covers NUTS1, NUTS2 and NUTS3 regions.

As figure 9 indicates, the GDP/capita in the regions analysed varies between EUR 5,300 and EUR 65,700 per inhabitant. The range thus exceeds that of the countries considered, as a comparison with figure 1 reveals. The EU value of EUR 29,200 was exceeded by regions in the sample from Austria (Salzburg, Steiermark), Belgium (Flanders), Denmark (Hovedstaden), Finland (Etelä-Karjala, Helsinki-Uusimaa, Lappi, Pohjois-Pohjanmaa, Satakunta, Varsinais-Suomi), France (Pays de la Loire), Germany (Baden-Württemberg, Bayern, Berlin, Hamburg, Saarland), Italy (Lombardia, Piemonte), Netherlands (Limburg, Noord-Nederland, Oost-Nederland), Spain (Navarra), Sweden (Stockholm, Skåne län), and the United Kingdom (Northamptonshire).[26]

In terms of the importance of selected branches, 17 of the sample regions show industrial employment shares of 20% and higher: Severozápad (Czech Republic; 33.4%), Slaskie (Poland; 32.4%), Západné Slovensko (Slovakia; 29.5%), Wielkopolskie (Poland; 27.3%), Baden-Württemberg (Germany; 25.9%), Norte (Portugal; 25.7%), Pomorskie (Poland; 24.3%), Podkarpackie (Poland; 24.0%), Navarra (Spain; 23.5%), Saarland (Germany; 22.1%), Bayern (Germany; 21.8%), Satakunta (Finland; 21.7%), Zachodniopomorskie (Poland; 21.4%), Piemonte (Italy; 21.4%), Malopolskie (Poland; 21.0%), and Lombardia (Italy; 21.0%).[27]

Comparable to the national analysis in this report (see section 2.1), the category "other" has a considerable weight of between 30.6% and 70.4%: public administration, defence, education, human health and social work activities alone take between 10% and 35% of the total employment in the sample regions.

The respondents' assessment[28] of the general situation in their region provides insight into selected features related to clusters and to industrial change (figure 10). Answers in the categories at the margins, i.e. "very difficult" and "excellent" are rather rare, but when considering both the positive categories "good" and "excellent", it appears that access to public funding of innovation projects is ranked best (26 positive answers), followed by the availability of co-working spaces (21 positive answers) and business creation (18 positive answers). At the other end of the spectrum, the availability of qualified personnel with specialised skills, and training measures for innovative skills receive comparably low positive and high sceptical assessments. Even though these

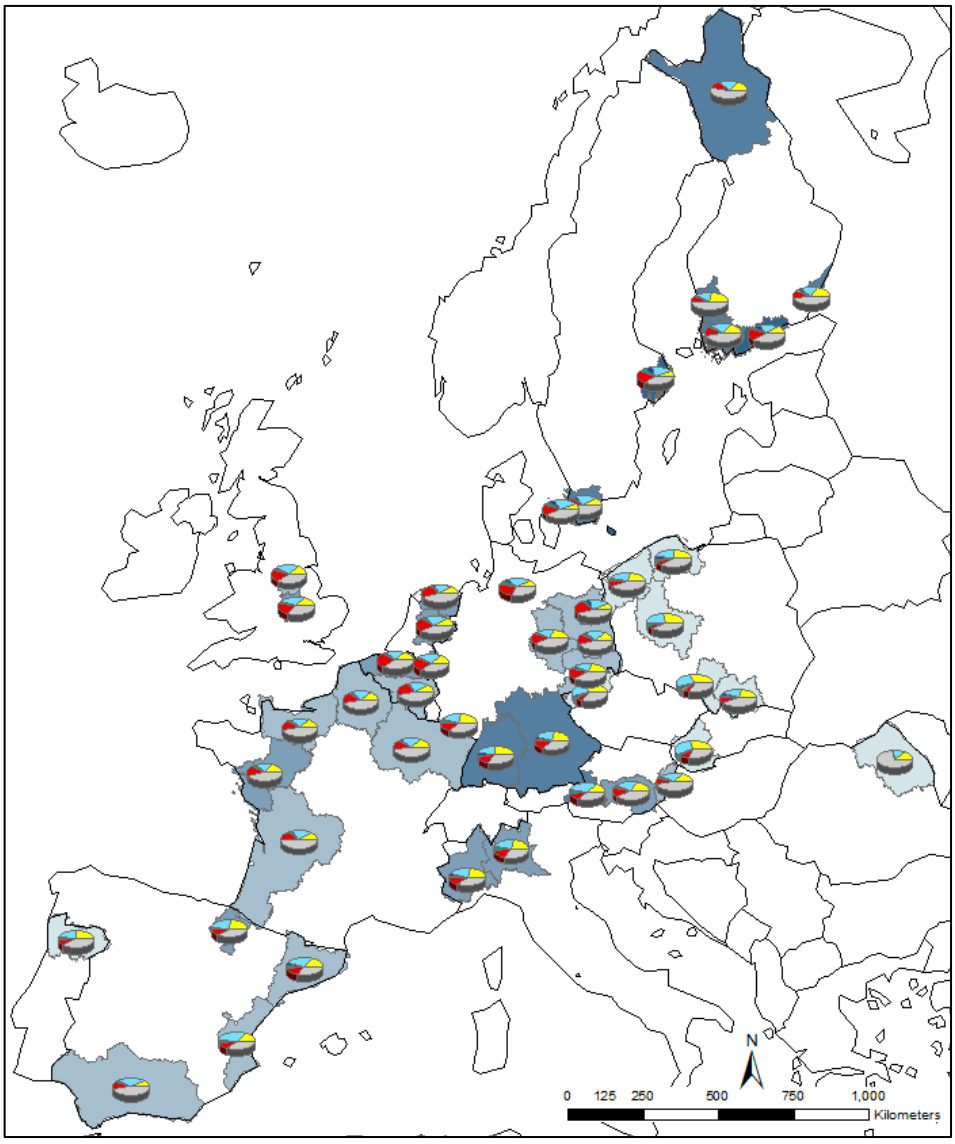
[26] in alphabetical order.

[27] in descending order.

[28] The following analyses show the total number of assessments, including cases with more than one answer per region.

findings are based on a limited number of respondents, these findings show that skills-related aspects seem to leave room for improvement in some of the sample regions.

Figure 9 - Basic economic data of regions participating in the EOCIC regional cluster programme survey 2018



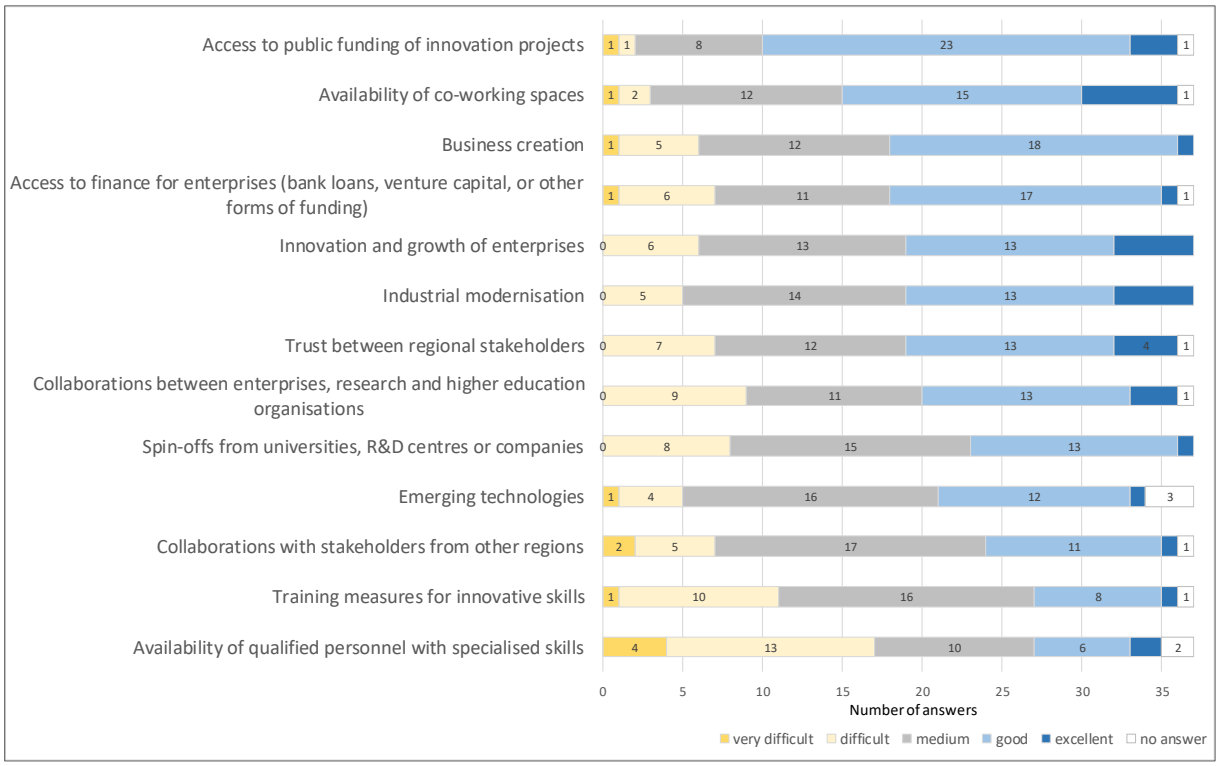
Source: European Observatory for Clusters and Industrial Change. Data sources: Eurostat (latest year of available data: 2016/2015), © EuroGeographics for the administrative boundaries. Map produced with ESRI ArcMap 10.

Legend:

GDP/capita (€)
- 5,200 - 17,300
- 17,300 - 29,400
- 29,400 - 41,500
- 41,500 - 53,600
- 53,600 - 65,700

Employment
- Industry (except construction)
- Wholesale and retail trade, transport, accommodation and food service activities
- Information and communication
- Financial and insurance activities
- Real estate activities
- Professional, scientific, technical activities; administr. and support service activities
- Other

Figure 10 - Assessments of the situation in the sample regions



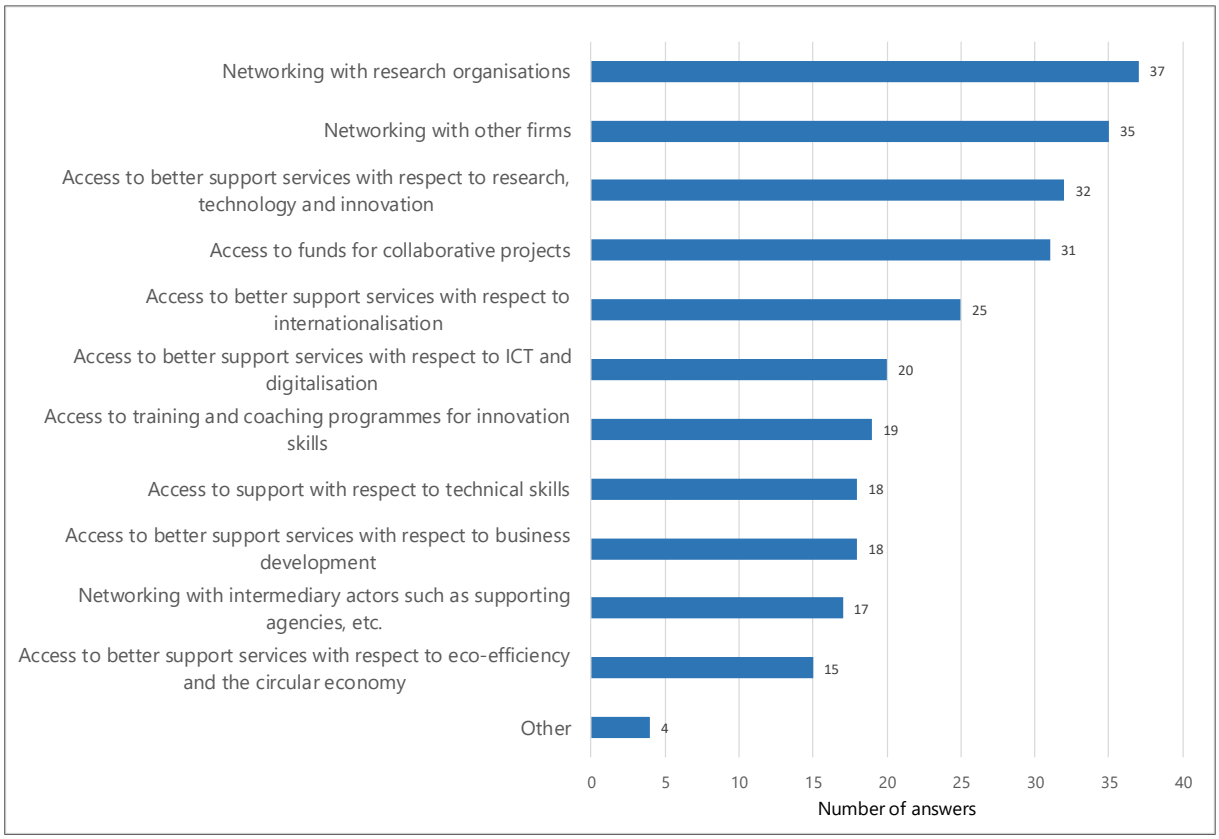
Source: European Observatory for Clusters and Industrial Change, online survey on regional cluster programmes 2018 (37 answers for 36 regions)[29]

When asked for their assessment on the benefits for regional enterprises - particularly small and medium-sized enterprises - of joining a cluster initiative, most respondents emphasised networking effects, both with research organisations and also with other firms (figure 11). But the access to better support services related to research, technology and innovation, and to funds for collaborative projects are also mentioned frequently (more than 30 answers). Business development support services, skills related aspects, support services with respect to ICT and digitalisation are mentioned by between 18 and 20 respondents, while internationalisation support services are mentioned by 26 respondents.

Additional answers given by the respondents under the "other" category embrace access to large companies, understanding mega trends, support in strategic development, visibility, easing in reaching SMEs and informing them about relevant instruments and initiatives, facilities for testing and validation, and access to mentoring and leadership development. In total, this shows that a broad range of firm activities can be facilitated and supported through clusters, and that clusters may serve as a lever to present their members' activities and to enhance their visibility.

[29] in descending order "good/excellent".

Figure 11 - Benefits for regional enterprises of joining a cluster initiative



Source: European Observatory for Clusters and Industrial Change, online survey on regional cluster programmes 2018 (38 answers for 37 regions; multiple answers were possible)

Focusing specifically on new enterprises in the sample regions, 26 of 38 respondents assessed the support services for this type of enterprise as very comprehensive (three answers) or good (23 answers), and only two respondents stated that their regions does not provide any specific support services for new enterprises.[30] Cluster organisations support new enterprises in various sample regions: 22 respondents gave an affirmative answer to this question, while 15 respondents said this was not the case. In total, the general situation of new businesses and young enterprises, including support through specialised services and/or clusters receives a fairly positive assessment from the respondents in most of the sample regions.

Focusing on cluster policies, strategies and cluster policy interventions, table 5 gives an overview of the cluster support delivered in the regions that participated in the survey.

[30] A further ten respondents characterised the support services for new enterprises as "medium" (seven answers) or "poor" (three answers).

Table 5 - Overview of current cluster policies/strategies in selected European regions

Country	Region	Cluster Programme	Duration
Austria	Burgenland	Regional cluster policy or strategy in place.	
	Salzburg	No regional cluster policy or strategy in place, but strategy or policy to support clusters in the past and no plans to develop strategy or policy in the near future.	
	Steiermark	Regional cluster policy or strategy in place. 1 cluster supporting programme.	
Belgium	Flanders	Regional cluster policy or strategy in place. 1 cluster supporting programme: Flanders cluster program; www.vlaio.be/clusters	
	Wallonie	Regional cluster policy or strategy in place. 2 cluster supporting programmes: Wallonia Business Clusters; www.clusters.be	Since 2000
		Wallonia Pôles de Compétitivité; www.clusters.be	Since 2006
Czech Republic	Severozápad	No regional cluster policy or strategy in place. No strategy or policy to support clusters in the past and no plans to develop strategy or policy in the near future.	
Den-mark	Hovedstaden	Regional cluster policy or strategy in place which includes participation in the national innovation networks Welfare Tech and Food Network, as well as the European Regional Development Fund: Food Network, http://www.foodnetwork.dk/	
		Welfare Tech; https://www.welfaretech.dk/	2019-2020
		ERDF - 1b; https://regionalt.erhvervsstyrelsen.dk/projektkort	2014-2020
		In late 2018, the Danish Executive Board for Business Development and Growth was established. The Board will publish a strategy which will focus and consolidate publicly supported cluster initiatives within a limited number of areas.	2020-
Finland	Etelä-Karjala	Regional cluster policy or strategy in place. 2 cluster supporting programmes.	
	Helsinki-Uusimaa	No regional cluster policy in place, but strategy or policy to support clusters in the past and no plans to develop strategy or policy in the near future. The region implements its Smart Specialisation Strategy. It is not a cluster policy even though it has some similar aspects.	
	Lappi	Regional cluster policy or strategy in place. Regional cluster policy interventions are organised as part of the implementation of the S3 strategy in the region. 3 cluster supporting programmes: Regional Smart Specialisation Strategy (Arctic Smartness); http://arcticsmartness.eu/	2012-2020 plus two years
		Regional Development Programme - Lapland Agreement	3 years
		Regional Rural Development Programme	3 years
	Pohjois-Pohjanmaa	Regional cluster policy or strategy in place.	

Country	Region	Cluster Programme	Duration
	Satakunta	Regional cluster policy or strategy in place. 2 cluster supporting programmes: Satakunta regional Programme 2018-2021; www.satakuntaliitto.fi	2018-2021
		Industrial Pilot Programme; www.satakuntaliitto.fi	2016-2019
	Varsinais-Suomi	Regional cluster policy or strategy in place.	
France	Grand Est	Regional cluster policy or strategy in place. 2 cluster supporting programmes: Economic Development, Innovation and Internationalisation Regional Strategy; www.be-est.fr	2017-2021
		Regional Innovation Strategy and Smart Specialisation Strategy	2015-2021
	Hauts-de-France	Regional cluster policy or strategy in place. 3 cluster supporting programmes: Booster filière	2017-2020
		Booster innovation	2017-2020
		Booster exportation	2017-2020
	Normandie	Regional cluster policy or strategy in place. 4 or more cluster supporting programmes: Phase 3 Pôles de compétitivité; http://competitivite.gouv.fr/accueil-3.html	2013-2018
		12 filières stratégiques; https://www.normandie.fr/	2017-2019
	Nouvelle Aquitaine	Regional cluster policy or strategy in place. 3 cluster supporting programmes: SRDEII (Regional Scheme for growth and innovation; https://www.nouvelle-aquitaine.fr/toutes-actualites/srdeii-region-fixe-cap.html	2016-2021
		SRESRI (Regional scheme for Education, Research and Innovation); https://www.nouvelle-aquitaine.fr/toutes-actualites/enseignement-superieur-recherche-innovation-vers-societe-connaissance.html	2018-2021
		3 ERDF Regional Operational Programmes (Aquitaine, Limousin, Poitou-Charentes)	2014-2020
	Pays de la Loire	Regional cluster policy or strategy in place.	
Germany	Baden-Württemberg	Regional cluster policy or strategy in place. 3 cluster supporting programmes: EFRE-CLIP Cluster- und Innovationsplattformen 2014-2020; https://efre-bw.de	2014-2020
		Internationalisierung von Cluster-Initiativen; https://www.bw-i.de	2010-2019
		ClusterAgentur Baden-Württemberg; https://www.clusterportal-bw.de	2014-2021
	Bayern	Regional cluster policy or strategy in place. 1 cluster supporting programme: Cluster-Offensive Bayern; https://www.cluster-bayern.de/	2016-2019
	Berlin	Regional cluster policy or strategy in place. 4 or more cluster programmes: Common Innovation Strategy Berlin-Brandenburg; www.innoBB.de	2011-2018
		Operationelles Programm EFRE	2013-2020

Country	Region	Cluster Programme	Duration
	Brandenburg	Regional cluster policy or strategy in place. 4 or more cluster supporting programmes.	
	Hamburg	Regional cluster policy or strategy in place. 1 cluster supporting programme: Clusterpolitik in Hamburg; http://www.hamburg.de/wirtschaft/clusterpolitik/	ongoing
	Saarland	Regional cluster policy or strategy in place. Currently no cluster supporting programme in place, but policy interventions to support clusters in the past and planned for the near future.	Since 2001
	Sachsen	Regional cluster policy or strategy in place.	
	Sachsen-Anhalt	Regional cluster policy or strategy in place. 1 cluster supporting programme: Koordinierungsrahmen GRW; www.clusterplattform.de	Continuous
Italy	Lombardia	Regional cluster policy or strategy in place. 1 cluster supporting programme: Regional call to support 9 CTL; http://www.fesr.regione.lombardia.it/wps/portal/PROUE/FESR/Bandi/DettaglioBando/Agevolazioni/cluster-tecnologici-lombardi-por-fesr-2014-2020	2016-2018
	Piemonte	Regional cluster policy or strategy in place. 4 or more cluster supporting programmes: Regional Innovation Cluster, http://www.regione.piemonte.it/attivitaProduttive/web/sistema-della-ricerca-e-dell-innovazione-in-piemonte/poli-di-innovazione	2015-2019
		Innovation Cluster - Line A; http://www.regione.piemonte.it/attivitaProduttive/web/fondi-strutturali-por-fesr-2014-2020/bandi-e-finanziamenti/poli-di-innovazione-linea-a	2017-2019
		Innovation Cluster - Line B; http://www.regione.piemonte.it/attivitaProduttive/web/fondi-strutturali-por-fesr-2014-2020/bandi-e-finanziamenti/poli-di-innovazione-linea-b	2017-2019
Nether-lands	Limburg	Regional cluster policy or strategy in place. 2 cluster supporting programmes: Brightlands Campussen Limburg; https://www.brightlands.com/	Since 2014
		LimburgMakers and LimburgLogistics; www.liof.nl	2017-2020
	Noord-Nederland	Regional cluster policy or strategy in place. 2 cluster supporting programmes.	
	Oost-Nederland	Regional cluster policy or strategy in place. 3 cluster supporting programmes: #in - Overijssel innoveert en internationaliseert; http://www.overijssel.nl/thema's/economie/innovatie-0/	2016-2019
		OP-Oost; www.op-oost.eu	2014-2020
		Agenda voor Twente; https://www.agendavoortwente.nl/	2018-2022
Poland	Malopolskie	No regional cluster policy or strategy in place, but strategy or policy to support clusters in the past and plans to develop strategy or policy in the near future. A survey is being conducted among clusters and their participants of the demand for such a policy.	

Country	Region	Cluster Programme	Duration
	Podkarpackie	No regional cluster policy or strategy in place, but strategy or policy to support clusters in the past and plans to develop strategy or policy in the near future.	
	Podlaskie	No regional cluster policy or strategy in place. No strategy or policy to support clusters in the past and no plans to develop strategy or policy in the near future.	
	Pomorskie	No regional cluster policy or strategy in place, but strategy or policy to support clusters in the past and no plans to develop strategy or policy in the near future.	
	Slaskie	No regional cluster policy or strategy in place. No strategy or policy to support clusters in the past and no plans to develop strategy or policy in the near future.	
	Wielkopolskie	Regional cluster policy or strategy in place. 1 cluster supporting programme: Business Support Institutions-Business-Science Cooperation 2018	2017-2018
	Zachodnio-pomorskie	No regional cluster policy or strategy in place. No strategy or policy to support clusters in the past and no plans to develop strategy or policy in the near future.	
Portugal	Norte	Regional cluster policy or strategy in place. 4 or more cluster supporting programmes: Norte Regional Operational Programme 2014-2020; http://norte2020.pt/	2014-2020
Romania	Nord-Est	No regional cluster policy or strategy in place. No strategy or policy to support clusters in the past and no plans to develop strategy or policy in the near future.	
Slovakia	Západné Slovensko	Regional cluster policy or strategy in place. Currently no cluster supporting programme in place, but policy interventions to support clusters in the past and planned for the near future.	
Spain	Andalucía	Regional cluster policy or strategy in place. Policy interventions to support clusters in the past and planned for the near future. 4 or more cluster supporting programmes: Plan de Actuación Global de la Zona del Mármol	Since 1983
		Plan del Calzado de Valverde	Since 1983
		Marroquineria de Ubrique	Since 1983
	Cataluña	Regional cluster policy or strategy in place. 1 cluster supporting programme: Catalonia Clusters; http://www.accio.gencat.cat/ca/serveis/processos-acreditacio/clusters/	2017-2020
	Navarra	Regional cluster policy or strategy in place. 2 cluster supporting programmes: Cluster support grants for collaborative projects; http://www.navarra.es/home_es/servicios/ficha/7420/Convocatoria-de-2018-de-subvenciones-a-actuaciones-colaborativas-de-clusteres-y-de-plataformas-habilitadoras	1 year
		Support services from the regional development agency; http://www.sodena.com/index.php/en/estrategia-regional/clusteres.html	1 year

Country	Region	Cluster Programme	Duration
	Valencia	Regional cluster policy or strategy in place. 3 cluster supporting programmes: Industrial Strategy Plan for Valencia Region-PEIV	2018-2021
		Industrial Strategy Plan for Valencia Region focused on Energy	
		Industrial Strategy Plan for Valencia Region- PEIV focused on Car industry	
Sweden	Skåne län	Regional cluster policy or strategy in place. 4 or more cluster supporting programmes: Open Innovation Arenas add strength to cluster initiatives - Regional Cluster Development Programme 2017-2021; https://utveckling.skane.se/siteassets/publikationer_dokument/klusterprogram-eng.pdf	2017-2021
		An International Innovation strategy for Skåne; http://s3platform.jrc.ec.europa.eu/documents/20182/232763/SE_Sk%C3%A5ne_RIS3_201109_Final.pdf/672786c5-8ef7-4935-aa8b-7429a32a8aa2	2012-2020
	Stockholm	No regional cluster policy or strategy in place. No strategy or policy to support clusters in the past and plans to develop strategy or policy in the near future. The Stockholm ERDF programme has a focus on strategic, collaborative projects to support a Sustainable Urban Development. Some of these projects may develop into RDI platforms/clusters to support the implementation of RIS3 and interregional collaborations.	
United Kingdom	Derby, Derbyshire, Nottingham and Nottingham-shire	Regional cluster policy or strategy in place. 4 or more cluster supporting programmes: Enabling Innovation; https://enablinginnovation.org.uk/	2016-2019
		INSTILS; https://www.medilinkem.com/projects/instils-derby-notts/	2016-2018
		Catalysing growth through research for Transport Equipment Manufacturing; https://www.d2n2growthhub.co.uk/blog/transport-equipment-manufacturing-industry-boosted-by-new-support/	2016-2019
	Northampton-shire	Regional cluster policy or strategy in place. 1 cluster supporting programme: Silverstone Technology Cluster; www.silverstonetechnologycluster.com	Since 2017

Source: European Observatory for Clusters and Industrial Change, online survey on regional cluster programmes 2018.[31]

[31] Sources of programme or Administration logos: https://www.burgenland.at/; https://www.salzburg.gv.at/; https://www.verwaltung.steiermark.at/; https://www.vlaanderen.be/en; http://clusters.wallonie.be/federateur-en/; http://clusters.wallonie.be/servlet/Repository/2018-01-22_brochure-fr.pdf?ID=118765&saveFile=; https://www.foodnetwork.dk/; https://www.welfaretech.dk/; https://regionalt.erhvervsstyrelsen.dk/sites/default/files/media/erdf_regionalfondsprogram_-_tilgaengelig.pdf; https://www.ekarjala.fi/; https://arcticsmartness.eu/; http://www.lappi.fi/lapinliitto/en/development/regional_development_plan/plan_2030; www.satakuntaliitto.fi/; https://www.be-est.fr/; http://www.hautsdefrance.fr/srdeii/; https://www.normandie.fr/le-developpement-des-filieres-economiques; https://www.nouvelle-aquitaine.fr/toutes-actualites/enseignement-superieur-recherche-innovation-vers-societe-

As table 5 shows, strategies or policies for supporting clusters are in place in most sample regions, either in the form of dedicated cluster programmes, as programmes for economic support, or as part of Operational Programmes or Smart Specialisation Strategies.[32] Some regions have more than one programme in place to support clusters, and eight regions support clusters through four or more programmes.[33]

The duration of the different programmes also varies: some programmes are just for one year, while others are designed for a multi-annual period. In most cases, regions in the same country gave similar answers to the question whether cluster policies or strategies are in place. In Belgium, France, Germany, Italy, Netherlands, Spain and the United Kingdom, all participating regions claimed that regional policies or strategies for cluster support are in place. In the cases of Austria, Finland, Poland and Sweden, the sample regions differ with respect to cluster supporting policies or strategies.[34]

Not surprisingly, in most regions cluster support is delivered as part of regional programmes (affirmative answers in 30 sample regions; see also

connaissance.html; https://efre-bw.de/; https://www.bw-i.de/startseite.html; https://www.clusterportal-bw.de/; https://www.cluster-bayern.de/; http://innobb.de/de/home; https://www.brandenburg.de/; https://www.hamburg.de/wirtschaft/clusterpolitik/; https://www.saarland.de/; https://mw.sachsen-anhalt.de/;
http://www.fesr.regione.lombardia.it/wps/portal/PROUE/FESR/Bandi/DettaglioBando/Agevolazioni/cluster-tecnologici-lombardi-por-fesr-2014-2020;
http://www.regione.piemonte.it/attivitaProduttive/web/sistema-della-ricerca-e-dell-innovazione-in-piemonte/poli-di-innovazione; https://www.brightlands.com/; https://www.liof.nl/nl; https://www.snn.nl/; http://www.overijssel.nl/thema's/economie/innovatie-0/; http://www.op-oost.eu/; https://www.agendavoortwente.nl/; https://regionwielkopolska.pl/; http://norte2020.pt/; https://www.juntadeandalucia.es/; http://www.accio.gencat.cat/ca/serveis/processos-acreditacio/clusters/; http://www.navarra.es/home_es/servicios/ficha/7420/Convocatoria-de-2018-de-subvenciones-a-actuaciones-colaborativas-de-clusteres-y-de-plataformas-habilitadoras;
http://www.gva.es/va/inicio/presentacion;jsessionid=dv8hcv2c1Vy9hCkXdw23pNyvxBT7QpRCLCF2nqJvYb1mT1Dnjh4d!-812468684!1550825148383;
https://utveckling.skane.se/siteassets/publikationer_dokument/klusterprogram-eng.pdf;
https://www.skane.se/; https://enablinginnovation.org.uk/;
https://www.medilinkem.com/projects/instils-derby-notts/;
https://www.d2n2growthhub.co.uk/blog/transport-equipment-manufacturing-industry-boosted-by-new-support/; https://www.silverstonetechnologycluster.com/.

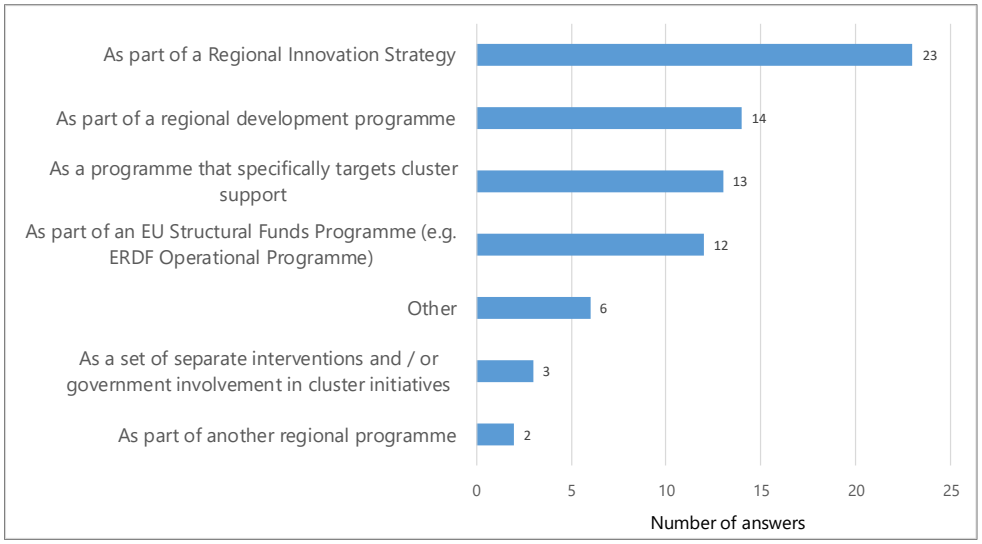
[32] European Member State regions may benefit from various support activities of the European Union such as for instance as part of cluster excellence, cluster collaboration or cross-sectoral value chain initiatives (Schierenbeck, C. (2018): European Cluster Policy updates. Interreg Europe Policy Learning Platform, Thematic workshop "Clusters as drivers of regional innovation, SME competitiveness and interregional cooperation". Leuven, 20 June 2018, https://www.interregeurope.eu/fileadmin/user_upload/plp_uploads/2018-06-15_PLP_Presentation_TO1_Thematic_workshops_draft.pdf; cf. also https://www.clustercollaboration.eu/eu-initiatives).

[33] In these cases, the respondents were asked to provide details on the three most important programmes that include cluster support.

[34] However, information for more than one region per country is not available in all cases.

table 10 in annex B). In some regions (Hovedstaden, Grand Est, Normandie, Lombardia, Noord-Nederland), cluster support is delivered through national and regional programmes, while other sample regions (Lappi, Berlin, Piemonte, Derby/Derbyshire/Nottingham/
Nottinghamshire) use regional and EU/interregional programmes for cluster support. Regional, national and EU/interregional programmes are taken into account for supporting clusters in Nouvelle Aquitaine, Baden-Württemberg, Saarland, Norte, Skåne län, and Oost-Nederland. Most cluster policy interventions in the sample regions are organised in the context of Regional Innovation Strategies. This category ranks higher than regional development programmes or cluster programmes (figure 12). This shows the high interrelationship of cluster and innovation support.

Figure 12 - Organisation of regional cluster policy interventions



Source: European Observatory for Clusters and Industrial Change, online survey on regional cluster programmes 2018 (33 answers for 32 regions; multiple answers were possible)

Table 10 (annex B) gives more detailed information on this, showing how cluster support is delivered in the sample regions and where strong or very strong relationships between regional cluster support and national or European cluster policies exist. While cluster support in one set of sample regions is delivered with one dedicated programme or strategy (Steiermark, Bayern, Saarland, Wielkopolskie, Západné Slovensko, Andalucía, Cataluña, Noord-Nederland, Northamptonshire, Flanders), other sample regions integrate cluster support in two or more strategies or programmes. Lappi's clusters are fostered under five strategies or programmes, ranging from the Regional Innovation Strategy and the regional development programme to EU Structural Funds Programmes and Smart Specialisation Strategies as well as other regional programmes. This shows that some regions set up dedicated programmes for cluster support, while others integrate the promotion of regional clusters under the umbrella of broader programmes that are in place in the region.

These approaches may vary between different regions of the same country, as the examples of Finland, France, Germany, Italy, Spain, the Netherlands and the United Kingdom show. Depending on the way in which cluster policy interventions are organised, support is delivered within national and/or regional and/or European Union programmes (see above). Strong or very strong relationships with national or European cluster policy are not always congruent with the delivery of cluster support. This shows that strong relationships with a higher governance level can be independent of the level at which cluster support is delivered.

Summary box on regional strategies to support clusters

The results of the regional survey show that European regions pursue different approaches to promoting clusters. Most often, regional clusters are supported as part of Regional Innovation Strategies, but clusters are also supported through economic development programmes and specific cluster programmes. In addition, European Union programmes - more specifically Structural Funds Programmes - occupy an important position in supporting clusters in European regions.

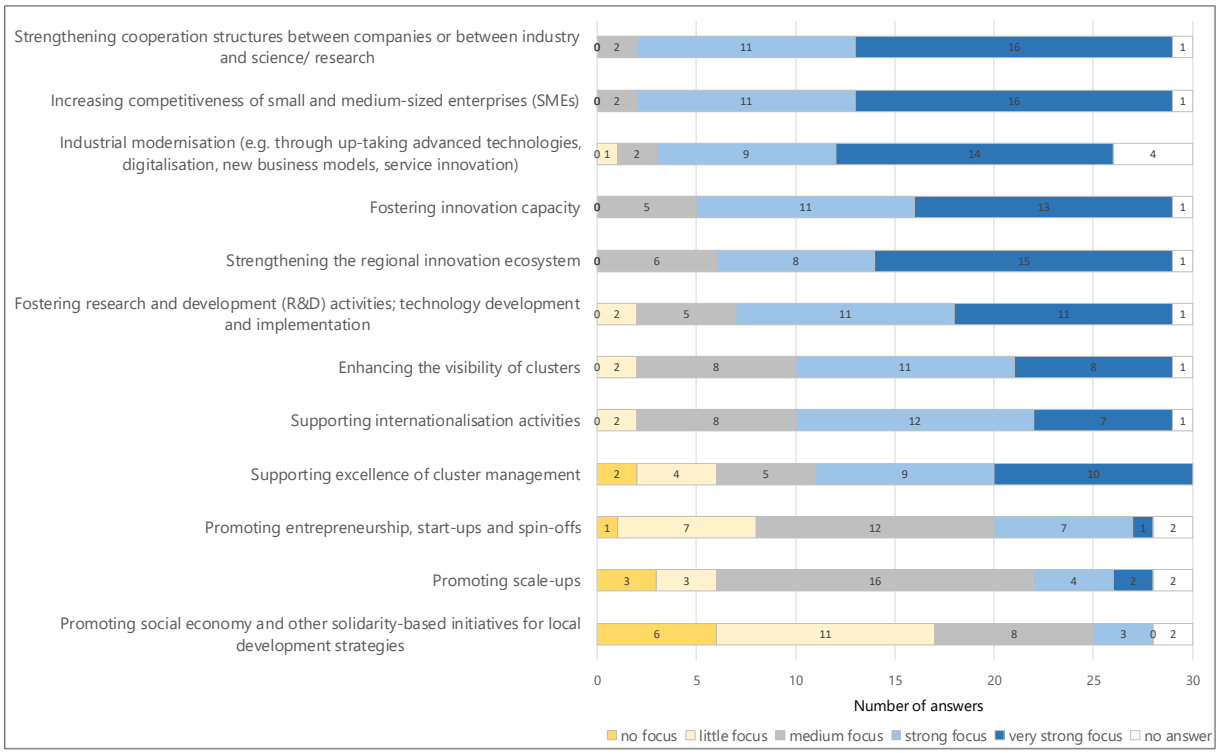
Clusters in European regions are frequently supported under regional programmes or in a combined approach between different (European, national, regional) governance levels.

3.2 Objectives and focus of regional cluster programmes

Comparable to the national survey, the most important objectives (in terms of strong or very strong focus) are strengthening cooperation structures between companies or between industry and science/research, and increasing the competitiveness of small and medium-sized enterprises (see figures 13 and 14 below).

This indicates that the cooperation structures within clusters, the competitiveness of small and medium-sized enterprises as well as the research and innovation-related characteristics of the regional framework conditions receive a high focus in regional cluster programmes. Regional cluster support is not different in this respect from cluster programmes at the national level. Only the internationalisation category receives a lower priority in regional programmes compared to the national level (see also figure 2 and figure 3).

Figure 13 - Objectives of cluster programmes in European regions

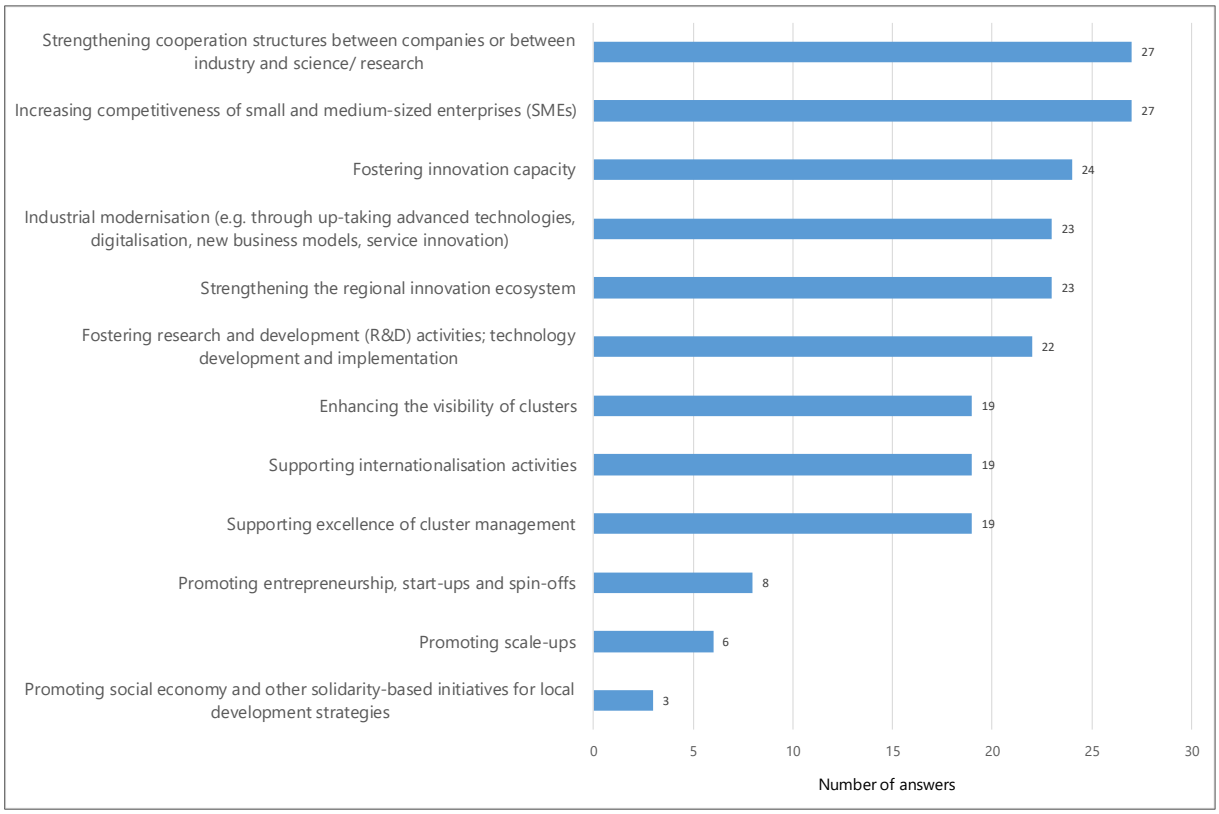


Source: European Observatory for Clusters and Industrial Change (EOCIC), online survey on regional cluster programmes 2018 (30 answers for 27 regions)[35]

Table 9 (annex B) shows that promoting entrepreneurship is highly rated by a comparatively moderate number of regions: Andalucía, Normandie, Hamburg, Norte, Hovedstaden, Northamptonshire, Skåne län and Wallonie assign a high or very high importance to this objective. The support of scale-ups receives high attention in cluster supporting programmes in Valencia, Hovedstaden, Limburg, Northamptonshire and Wallonie, while the promotion of the social economy or other solidarity-based initiatives is prioritised in Lappi, Hamburg and Skåne län. When it comes to specific support for small and medium-sized enterprises, the sample regions have a strong or very strong focus on existing industries in the region (26 affirmative answers) and on cross-sectoral collaboration (25 affirmative answers), followed by emerging industries (20 affirmative answers; see figure 15). However, 16 regions have a strong or very strong focus on all three types, while two regions have a strong or very strong focus on one of the three aspects: Grand Est (emerging industries), Hauts-de-France (existing regional industries) and Limburg (cross-sectoral collaboration), while there is a medium or little focus on other categories according to the respondents' assessment.

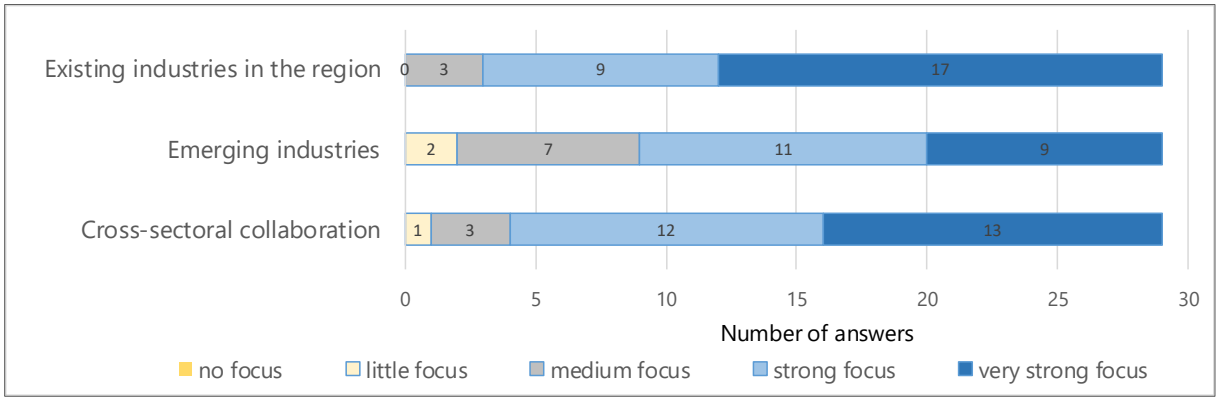
[35] in descending order "strong/very strong focus".

Figure 14 - Most important objectives of regional cluster programmes



Source: European Observatory for Clusters and Industrial Change, online survey on regional cluster programmes 2018 (30 answers for 27 regions)

Figure 15 - Focus of regional cluster programmes with regard to the support of SMEs



Source: European Observatory for Clusters and Industrial Change, online survey on regional cluster programmes 2018 (29 answers for 26 regions)

Summary box on the objectives and focus of regional cluster programmes

Increasing the competitiveness of SMEs, strengthening cooperation structures between different types of actors within clusters, industrial modernisation and fostering innovation capacity are the most important objectives that the sample regions pursue with their cluster support. Regional cluster programmes have a rather broad focus and address several objectives. This shows that regions not only target cluster-specific goals like boosting cooperation between different stakeholders, but that cluster policy is an important vehicle for supporting research, development and innovation, as well as industrial modernisation and the improvement of regional framework conditions.

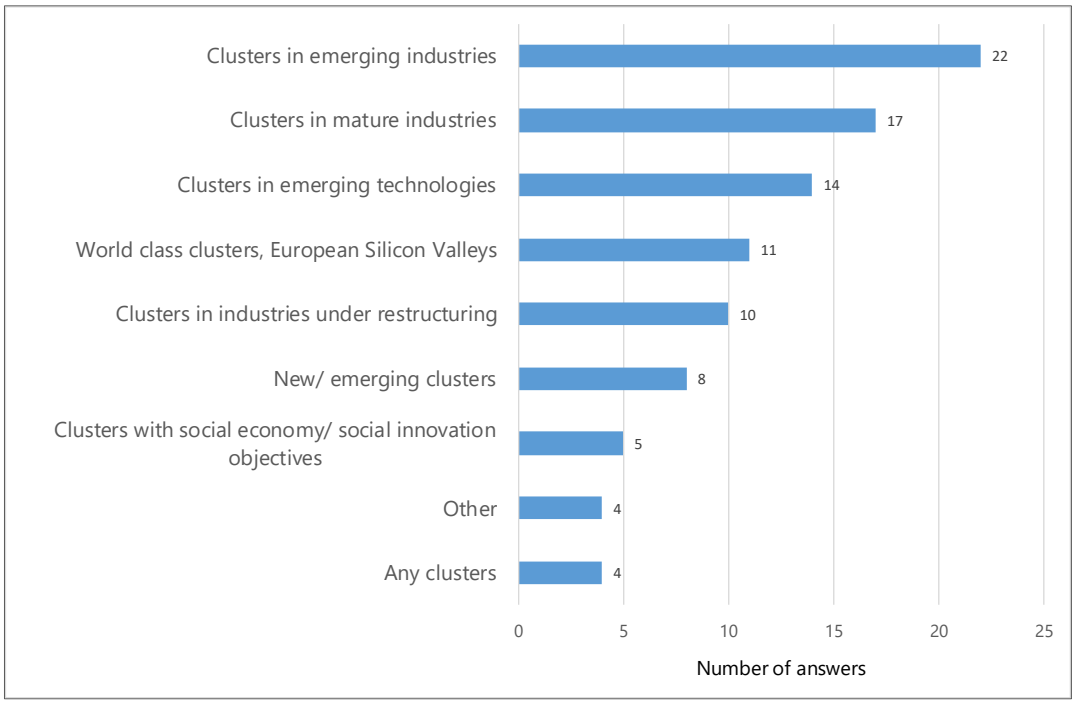
When it comes to SME support, existing industries in the region are the most highly targeted, immediately followed by cross-sectoral collaboration. Emerging industries receive a slightly lower ranking in the focus of cluster programmes.

3.3 Types of clusters targeted in regional cluster programmes

The most important types of clusters targeted by regional cluster support are clusters in emerging industries, clusters in mature industries and clusters in emerging technologies (figure 16). This finding is comparable with the national level (see figure 5), with the difference that regional clusters in mature industries receive a higher ranking than clusters in emerging technologies. It can be assumed that national programmes are stronger in support of new activities while regional cluster support focuses on new and existing (mature) activities in parallel. Mature industries might for instance be targeted with supporting measures for modernisation - an objective that receives high attention (see section 3.2).

Twelve regions attach high or very high importance to both emerging industries and emerging technologies, while an additional eight regions focus on emerging industries in their cluster support (see table 9 in annex B). High or very high importance is attributed to World Class Clusters and European Silicon Valleys in the cluster supporting programmes of Wallonie, Hovedstaden, Satakunta, Normandie, Nouvelle Aquitaine, Hamburg, Cataluña, Skåne län, Derby/Derbyshire/Nottingham/ Nottinghamshire, and Northamptonshire, while clusters with social economy or social innovation objectives are addressed in Lappi, Hamburg, Andalucía, Skåne län and Limburg. Some regions attach high or very high importance to new and emerging clusters, in addition to other types of clusters (Lappi, Satakunta, Hauts-de-France, Nouvelle Aquitaine, Navarra, Skåne län, and Limburg). In general, cluster support in the sample regions targets different types of cluster; an exclusive focus on one cluster type, such as in Northamptonshire (World class clusters, European Silicon Valleys), is rather an exception (see also table 9 in annex B).

Figure 16 - Most relevant types of clusters targeted in regional cluster programmes



Source: European Observatory for Clusters and Industrial Change, online survey on regional cluster programmes 2018 (29 answers for 27 regions; multiple answers were possible)

Summary box on the types of clusters targeted in regional cluster programmes

Many cluster supporting programmes in the sample regions attach high or very high importance to clusters in emerging industries, in mature industries and in emerging technologies. In most regions, cluster support targets various types of cluster. Often, emerging activities (emerging technologies, emerging industries) as well as existing industries in the region are targeted by cluster support. Some regions have a specific focus on industries which are restructuring in addition to other types of cluster. Comparable to national cluster programmes, regions frequently support both new and existing activities.

3.4 Relationship of regional cluster programmes to other policies or programmes

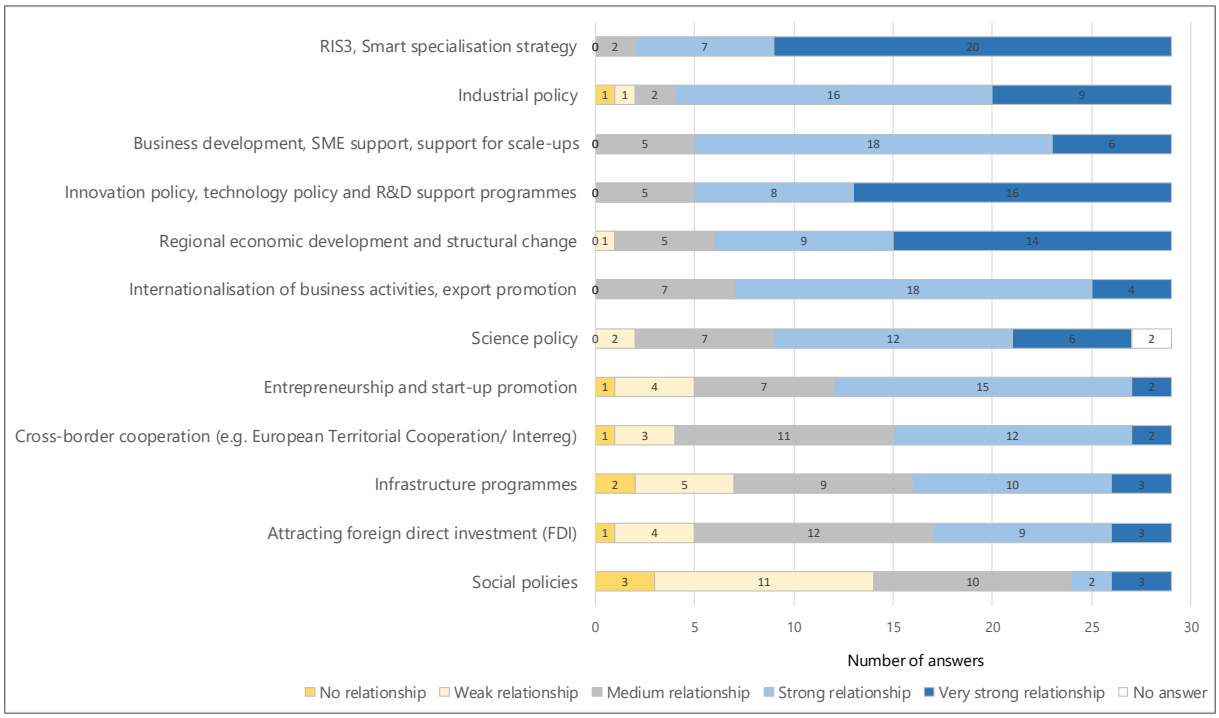
When asked about the strength of the relationship between cluster support and other policies in their region, the regional experts assigned a clear priority to the Smart Specialisation Strategies in the sample regions (figure 17). This confirms the findings cited above (see section 3.1) of most cluster policy interventions being delivered as part of Regional Innovation Strategies.

Further important relationships are with industrial policy, business development and SME policy, as well as scale-up support, and innovation-, technology-, R&D support. In total, between 22 and 27 answers mentioned RIS3/Smart Specialisation Strategy,

Industrial policy, Innovation/technology policy and R&D support, Business development and SME policy, as well as scale-up support, Regional economic development and structural change, and Internationalisation of business activities/export promotion as having a strong or very strong relationship with cluster support. This confirms that clusters are in many of the sample regions frequently considered in relation to their fields of specialisation, to innovation, technology, research and development and to industry and business promotion.

The top regional policy priorities in relation to cluster policies are comparable to those at national level (see section 2.4), but on the national level, innovation and technology policies as well as support for research and development receives the highest position. This is a further indication of the focus on new and innovative activities at the national level, while regions also assign a high priority to their existing business activities and fields of specialisation.

Figure 17 - Relationship of regional cluster support to other policies or programmes



Source: European Observatory for Clusters and Industrial Change, online survey on regional cluster programmes 2018 (29 answers for 26 regions)[36]

As could be seen for national cluster programmes, cluster support in regions has a strong interrelationship with further policy fields and proves to be an integral part of regional economic policy and business support. Less important relationships are visible

[36] in descending order "strong/very strong relationship".

for social policies. Here, other instruments seem to be in place that directly target social policy objectives.

Summary box on the relationship of regional cluster programmes to other policies or programmes

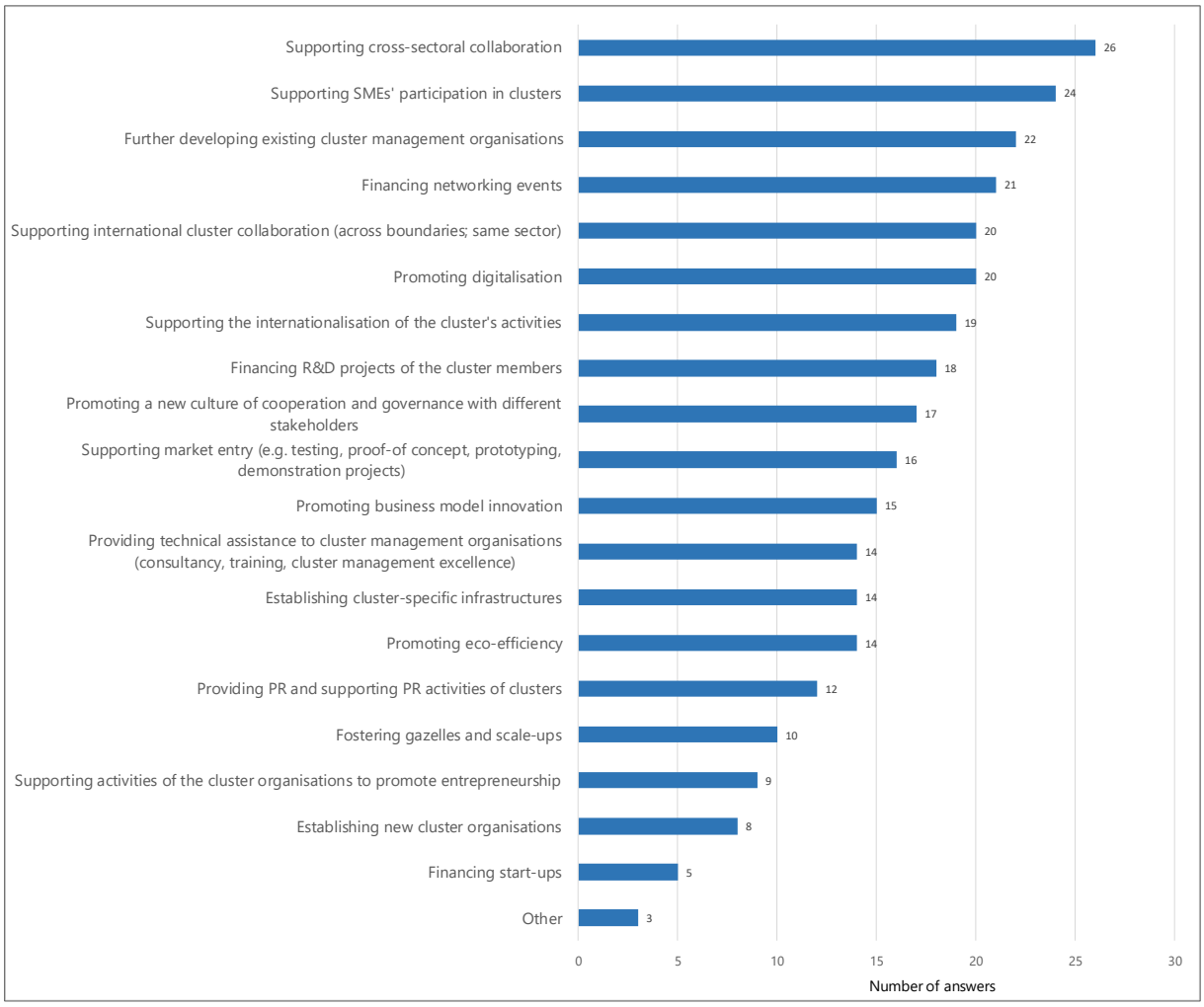
In the sample regions, cluster support is most strongly related to Smart Specialisation Strategies, industrial policy, technology and innovation policies, as well as business support and regional economic development. This shows the strong relationship with regional strategies of specialisation, industrial and economic development: clusters are considered important vehicles for implementing regional development policies. Their strong relationship with business development shows their importance for supporting regional business activities. Thus, clusters and cluster support are contributing to creating stimulating context conditions for regional businesses.

3.5 Measures to deliver regional cluster support

The most important mechanism for delivering cluster support in the sample regions is the support for cross-sectoral collaboration (figure 18), followed by the support for SME participation in clusters. Further mechanisms that are assigned high or very high importance (20 and more answers) are the development of existing cluster management organisations, the financing of networking events, international cluster collaboration within the same sector and promoting digitalisation. This shows that a range of measures are pursued, which not only address the further expansion of clusters, the development of cluster organisations, and the organisation of networking events, but also target more intense collaboration across sectors and boundaries. Digitalisation as an important current trend in business development also ranks high in the delivery of cluster support.

Comparing these findings with measures at the national level (section 2.5), it becomes obvious that SME participation in clusters and cross-sectoral collaboration are also among the measures of high importance. However, the priorities accorded to internationalisation and cluster members' research and development projects is higher in national cluster programmes, as well as in regional programmes with a high level of autonomy in innovation policy (e.g. Flanders and Wallonie). This finding is in line with the strong relationship with to innovation, technology and R&D policy at the national level and again confirms the higher focus on innovation and internationalisation activities of national cluster programmes.

Figure 18 - Important mechanisms to support clusters in regional cluster programmes



Source: European Observatory for Clusters and Industrial Chang, online survey on regional cluster programmes 2018 (29 answers for 26 regions)

Establishing new cluster management organisations receives a comparatively lower rank as was also the case in national cluster programmes. Promoting eco-efficiency seems to be of higher importance in the sample regions compared to national cluster programmes in Europe.[37] This is also the case for the promotion of business model innovation, as well as the promotion of digitalisation, and the support of gazelles and scale-ups.

As to specific support provided for clusters in the sample regions, grants receive the highest number of answers (28 answers). This is comparable to the position at national level. In second position (21 answers) is networking or partnership building. Technical assistance and training of cluster managements are cited 15 and 12 times. A significant

[37] The sample regions of Normandie, Valencia, Satakunta, Nouvelle Aquitaine, Lappi, Hamburg, Piemonte, Berlin, Oost-Nederland, Derby/ Derbyshire/ Nottingham/ Nottinghamshire, Northamptonshire, Skåne län, and Wallonie assign the promotion of eco-efficiency a high or very high importance.

majority of sample regions provides a mix of several types of support. Exceptions are Hauts-de France, Sachsen-Anhalt and Bayern: here, grants are the exclusive type of support provided for clusters. Most frequently, grants are combined with networking or partnership building and/or training of cluster managements. A combination of these three types of support is mentioned in Grand Est, Cataluña, Baden-Württemberg, Nouvelle Aquitaine, Lappi, Hamburg, Navarra, Norte, Piemonte, Hovedstaden, Berlin, Flanders and Skåne län. Some of these regions add further types of support such as technical assistance. Other sample regions mention region-specific aspects: Navarra adds competitive strategy analysis to grants, technical assistance, networking/partnership building, and training of cluster management, Wielkopolskie offers certification with grants, and networking/partnership building, and Derby/ Derbyshire/Nottingham/Nottinghamshire mentions innovation support, new product/process development, leadership and management development/mentoring in addition to grants, financial instruments, technical assistance, and networking/partnership building.

Summary box on measures to deliver regional cluster support

Most sample regions offer various measures and types of support for clusters and their activities. Cross-sectoral collaboration, the involvement of SMEs in cluster activities and the further development of cluster organisations receive the highest number of answers with high or very high importance. This indicates that clusters in the sample regions seem to have reached high levels of development and focus on the integration of (further) small and medium-sized enterprises, on collaboration across sectors and on the further professionalisation of their management organisations. Establishing new cluster organisations, on the contrary, does not seem to be high on the agenda in the sample regions.

In order to deploy their goals, clusters and cluster activities can benefit from various types of support. Most sample regions combine various support types for cluster activities. Nevertheless, grants are the most frequently cited support.

3.6 Funding and implementation of regional cluster programmes

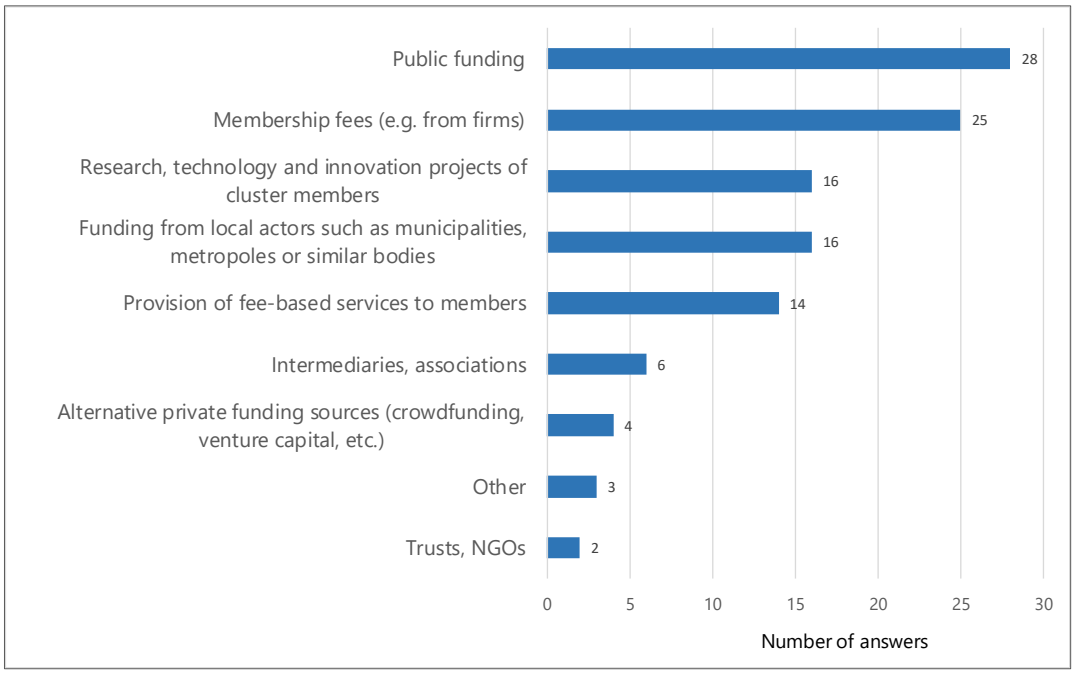
Regional funds are in the top position for funding cluster programmes in the sample regions. European Union funds and the private sector also receive high rankings, while national funds are of lower importance. Two regions further specify their answers: While universities are an additional funding source in Derby/Derbyshire/Nottingham/ Nottinghamshire, Skåne län emphasises that while their cluster programme is financed by regional funds, clusters benefit from further funding sources.

Cataluña, Satakunta, Wielkopolskie, Piemonte, Bayern, Flanders and Northamptonshire use one source for funding their cluster programmes, while the other sample regions mention between two and four different funding sources. EU funds support cluster programmes in 17 sample regions. While European funds are the exclusive funding source for cluster programmes in Satakunta and Piemonte, the regions of Andalucía, Grand Est, Valencia, Baden-Württemberg, and Berlin use them as co-funding of regional funds. Lombardia finances cluster programmes with EU and national funds, while Nouvelle Aquitaine, Lappi, Hamburg, Norte, Hovedstaden, Limburg, Oost-Nederland, Derby/Derbyshire/Nottingham/Nottinghamshire and Wallonie use various funding sources as co-funding with EU funds, including private funds. Private sector funds support cluster programmes in 14 regions, but Northamptonshire is the only sample region that exclusively uses private funds as a funding source for cluster programmes. Contrary to the national level, revenue from previous cluster activities or investments do not play any role in the sample regions.

Similar to national cluster programmes, annual budgets for regional programmes vary (see table 9 in annex B). It can be assumed that this depends on the size and budget plan of the region, the number of clusters and cluster programmes, and on the position that cluster policy receives within the overall portfolio of policies for regional economic support.

With the exception of Northamptonshire, where cluster organisations are solely funded by membership fees, the funding of cluster organisations in the sample regions comes from between two and seven funding sources. Public funds and membership fees are the most important sources for financing cluster organisations, but local funding and research/technology/innovation projects also play a considerable role. The general picture of cluster organisations' funding sources (figure 19) is fairly similar to that of the national level (figure 8).

Figure 19 - Sources of financing of cluster organisations in the sample regions



Source: European Observatory for Clusters and Industrial Change, online survey on regional cluster programmes 2018 (29 answers for 26 regions; multiple answers were possible)

Regional ministries or dedicated departments of the regional administration play a crucial role in the implementation of cluster supporting programmes: 20 regions mentioned one or several ministries as the body that is in charge of implementing the cluster programme. In the majority of sample regions, one or two bodies put cluster support into practice. Even within one country, the regional patterns of implementation bodies differ. This not only shows the broad variety of approaches in European regions, but also the level of flexibility in delivering cluster programmes. In the French, German or Italian sample regions, one or several regional ministries play a crucial role, partly in cooperation with local or regional development agencies, cluster organisations or further actors, such as an investment bank. In the United Kingdom, private or non-for-profit actors are in charge of implementing the programme.

Regional cluster organisations are widely involved in consultations with the regional or national government or institutions: 27 regions confirmed this. This shows the high degree of interrelationship between regional cluster organisations and the regional or national administration. The specific types of coordination are manifold; cluster organisations are involved in strategic questions, in dialogues, exchange and working groups, in Smart Specialisation Strategies, in specific forums for instance on research and development, in matters of regional development policies, etc. As a whole, the answers to this question emphasise the close interrelationship between cluster organisations and policy actors. This shows that experience and input from cluster

activities is considered a valuable input to strategy building and strategic policy-making.

In some cases, the cooperation is formal in nature, for instance through shareholdings of the regional government (Limburg) or through activities of cluster organisations on boards, in forums, working groups or the regional development and coordination commission (e.g. in Hovedstaden, Satakunta, Norte or Berlin). In Wallonie, for instance, cluster organisations are responsible for sectoral mapping, while cluster organisations in Lombardia and in Flanders are involved in consultations on Smart Specialisation Strategies, particularly for research and innovation, regional law, strategic programmes and calls. Piemonte involves cluster organisations in the definition and implementation of the Smart Specialisation Strategy, in ongoing dialogues on regional innovation strategies, and through engagement in national clusters.

In the light of the answers of many sample regions, the conclusion can be reached that exchanges are held on a regular and frequent basis. This underlines the high importance of clusters and their organisations for regional policy-making.

Summary box on funding and implementation of regional cluster programmes

Regional, European and private funds are the most important sources of financing for cluster programmes in the sample regions. In most regions, more than one funding source is used. Similarly, cluster organisations are in most cases also funded by more than one source; public funds and membership fees play the most important role. Cluster programmes' annual budgets vary across the sample regions - this was also the case for national cluster programmes. It can be assumed that the size of the region, the range of activities implemented through cluster programmes, and the number and types of supported clusters play an important role in this respect. The survey results also emphasise the high degree of interrelationship between regional policy and cluster organisations: the latter are consulted in different ways in strategic planning and policy making.

3.7 Target groups of regional cluster programmes

In most sample regions, various actors are eligible for funding in support of clusters (table 6). Cluster organisations are the main type of actor targeted (24 regions). In line with the highly ranked objective of SMEs' competitiveness (section 3.2) and given the fact that supporting SMEs' participation ranks highly among the measures to deliver cluster support (section 3.5), it is not surprising that SMEs rank second when it comes to the types of actor eligible for cluster support in the sample regions. Business associations, research institutions/science and technology parks as well as academic institutions and universities may benefit from funding in 11 or 12 regions respectively. Start-ups are targeted in 9 regions, while large firms belong to the group of eligible actors in 6 sample regions.

In some regions such as Baden-Württemberg, Bayern, Berlin, Lombardia, Navarra, and Skåne län, cluster funding targets one specific actor, generally cluster organisations. This is also the case in Hamburg and in Flanders, but the support is provided as a public-private partnership. Northamptonshire has no specific regional funding. The other sample regions support various actors; here, the spectrum ranges from two to seven types of different actors that are targeted by cluster support. Satakunta, Hauts-de-France, Normandie, and Nouvelle Aquitaine target all different types of actors, i.e. cluster organisations, different types of business enterprises, associations and intermediaries, science and research institutions. None of the regions has an explicit and exclusive focus on the different business actors; regions that target firms of different sizes and/or start-ups also target additional actors. On the other hand, some regions do not specifically target firms (Grand Est, Baden-Württemberg, Bayern, Berlin, Hamburg, Lombardia, Wielkopolskie, Cataluña, Navarra, Skåne län, Northamptonshire). Here, cluster support targets the regional framework conditions for industry and hence provide indirect support to private businesses.

Summary box on target groups of regional cluster programmes

Cluster support in the sample regions has a specific focus on a set of actors that can apply for funding. Cluster organisations are the most frequent actor targeted, often combined with further regional actors. While cluster support in some regions has an exclusive focus on cluster organisations, others target a broad range of actors, including cluster organisations, private businesses and scientific as well as research institutions. There are also regions that do not specifically target firms, but rather actors who shape regional framework conditions.

Table 6 - Target groups of cluster support in the sample regions

Country	Region	Cluster Programme	Cluster organisa-tions	SMEs	Large firms	Start-ups	Business associations, inter-mediaries	Research institutions, Science and technology parks	Academic institutions, universities	Other /comments
Belgium	Flanders	Flanders cluster program; support to spearheadclusters and innovative business networks	X	X	X	X				
	Wallonie	Wallonia Business Clusters, Wallonia Pôles de Compétitivité	X	X						*Wallonia Pôles de Compétitivité : Six selected pôles (top-down approach)*
Denmark	Hoved-staden	Food Network; Welfare Tech; ERDF - 1b	X	X				X	X	
Finland	Lappi	Regional Smart Specialisation Strategy (Arctic Smartness); Regional Development Programme - Lapland Agreement; Regional Rural Development Programme	X	X		X	X	X	X	
	Satakunta	Satakunta Regional Programme 2018-2021; Industrial Pilot Programme	X	X	X	X	X	X	X	
France	Grand Est	Economic development, innovation and internationalisation regional strategy; Regional Innovation Strategy and Smart Specialisation Strategy	X				X	X	X	
	Hauts-de-France	Booster filière; Booster innovation; Booster exportation	X	X	X	X	X	X	X	
	Normandie	Phase 3 Pôles de compétitivité; 12 filières stratégiques	X	X	X	X	X	X	X	
	Nouvelle Aquitaine	SRDEII (Regional Scheme for growth and innovation); SRESRI (Regional scheme for Education, Research and Innovation); 3 x ERDF Regional Operational Programme (Aquitaine, Limousin, Poitou-Charentes)	X	X	X	X	X	X	X	
Germany	Baden-Württemberg	EFRE-CLIP Cluster- und Innovationsplattformen 2014-2020; Internationalisierung von Cluster-Initiativen; ClusterAgentur Baden-Württemberg	X							

Country	Region	Cluster Programme	Cluster organisa-tions	SMEs	Large firms	Start-ups	Business associations, inter-mediaries	Research institutions, Science and technology parks	Academic institutions, universities	Other /comments
	Bayern	Cluster-Offensive Bayern	X							
	Berlin	Common Innovation Strategy Berlin-Brandenburg; Operationelles Programm EFRE	X							
	Hamburg	Clusterpolitik in Hamburg								*Cluster organisations in public-private partnership*
	Sachsen-Anhalt	Koordinierungsrahmen GRW	X	X						
Italy	Lombardia	Regional call to support 9 CTL	X							
	Piemonte	Regional Innovation Cluster; Innovation Cluster - Line A; Innovation Cluster - Line B	X	X	X					
Nether-lands	Limburg	Brightlands Campussen Limburg; LimburgMakers and LimburgLogistics	X	X				X	X	
	Oost-Nederland	#in - Overijssel innopveert en internationaliseert; OP-Oost; Agenda voor Twente	X	X			X	X	X	*Regional government, or (semi)governmental organisations*
Poland	Wielkopolskie	Business Support Institutions-Business-Science Cooperation 2018	X							*Business support institutions*
Portugal	Norte	Norte Regional Operational Programme 2014-2020	X	X		X	X	X	X	
Spain	Andalucía	Plan de Actuación Global de la Zona del Mármol; Plan del Calzado de Valverde; Marroquineria de Ubrique	X	X		X	X			
	Cataluña	Catalonia Clusters	X				X			
	Navarra	Cluster support grants for collaborative projects, Support services from the regional development agency	X							
	Valencia	Industrial Strategy Plan for Valencia Region-PEIV; Industrial Strategy Plan for Valencia Region focused on Energy industry; Industrial Strategy Plan for Valencia Region- PEIV focused on Car industry	X	X			X	X		

Country	Region	Cluster Programme	Cluster organisa-tions	SMEs	Large firms	Start-ups	Business associations, inter-mediaries	Research institutions, Science and technology parks	Academic institutions, universities	Other /comments
Sweden	Skåne län	Open Innovation Arenas add strength to cluster initiatives - Regional Cluster Development Programme 2017-2021; An International Innovation strategy for Skåne	X							
United Kingdom	Derby, Derbyshire, Nottingham and Nottinghamshire	Enabling Innovation; INSTILS; Catalysing growth through research for Transport Equipment Manufacturing		X		X		X	X	
	Northampton-shire	Silverstone Technology Cluster								*The cluster does not specifically provide funding*

Source: European Observatory for Clusters and Industrial Change, online survey on regional cluster programmes 2018 (30 answers for 27 regions; multiple answers were possible)

3.8 Support for further cluster development

Similar to the national survey, participants in the regional survey were asked which initiatives for the further development of cluster policies or cluster programmes they consider helpful. Two further categories were added to the answer categories in the national survey:[38] (1) More standardised data and methods to identify and evaluate clusters, and (2) Better methods to assess challenges due to many small clusters (e.g. in cases of fragmentation/overlap). Table 7 shows that the sample regions have specific needs and wishes for further support, and that all categories seem to be of importance for at least some of the participating regions. However, funding for research and development/innovation funds clearly comes first (31 affirmative answers), which is comparable to the assessments at the national level.

Between 20 and 27 positive answers ("high importance"/"very high importance") were attributed to: Information on improving framework conditions for cluster development; Developing skills and human resources (e.g. higher education, but also vocational training); Training for cluster management; Information on promoting business model innovation; More standardised data and methods to identify and evaluate clusters; Events for cluster matchmaking with clusters in Europe; Information on promoting new industrial activities; Access to markets including international markets; and Information on the upgrading and upscaling of industries and firms. These answers are fairly comparable to the results of the national survey (see section 2.8), where the development of skills and human resources is positioned slightly higher in terms of (highly) important answers. On the contrary, providing information on clusters in Europe is ranked higher at the national level.

Better methods for assessing challenges from many small clusters (e.g. in cases of fragmentation/overlap); Events for cluster matchmaking with clusters beyond Europe; ; and Providing information on clusters beyond Europe are given medium importance (between 9 and 14 "high importance" or "very high importance" answers), while Information on promoting digitalisation; Information on start-up support within the cluster; Information on providing physical infrastructure (e.g. business incubators, technology parks, information and communication technologies (ICT) infrastructure); Providing information on clusters in Europe, and Information on promoting business-related service sectors are cited by between 15 and 19 respondents as being highly or very highly important.

Representatives of all regions stated that cluster programmes will at least maintain their importance in the future. In 11 regions, cluster programmes will maintain their importance and will keep the current focus. Six regions plan to maintain the importance

[38] This was based on discussions at the European Cluster Policy Forums.

of their cluster programmes, but with a changed focus. Cluster programmes will gain in importance in 22 regions - keeping the current focus in nine and changing focus in 13 sample regions.

Summary box on support for further cluster development

Various initiatives could support the further development of cluster policies and cluster programmes in the sample regions. Regions have different assessments in this respect, depending on the specific focus and objectives of their policies. But funding for research and development/innovation funds clearly ranks first among the sample regions.

All sample regions plan to at least maintain the importance of their cluster programmes. A considerable number state that cluster programmes will increase in importance in the future. This is a further indication for the pertinence of clusters in the context of regional development.

Table 7 - Measures to support the development of cluster programmes in the sample regions

Country	Region	More standardised data and methods to identify and evaluate clusters	Better methods to assess challenges due to many small clusters (e.g. in cases of fragmentation/ overlap)	Events for cluster matchmaking with clusters in Europe	Events for cluster matchmaking with clusters beyond Europe	Access to markets including international markets	Providing information on clusters in Europe	Providing information on clusters beyond Europe	Information on the upgrading and upscaling of industries and firms	Information on promoting new industrial activities	Information on promoting business-related service sectors	Information on improving framework conditions for cluster development	Information on start-up support within the cluster	Developing skills and human resources (e.g. higher education, vocational training)	Information on providing physical infrastructure (e.g. business incubators, technology parks, ICT)	Funding for R&D/innovation funds	Information on promoting digitalisation	Information on promoting business model innovation	Training for cluster management	Other
Belgium	Flanders	+	0	+	0	0	+	+	+	+	+	+	+	+	+	+	+	+	+	
	Wallonie			+	0	+	+	+	0	+	-	-	-	0	-	+	+	0	+	
Czech Republic	Severozápad	0	-	-	-	-	-	-	0	0	0	+	0	+	-	0	-	0	+	
Denmark	Hovedstaden	0	0	+	+	+	0	0	0	0	0	0	+	0	0	+	0	0	0	
Finland	Helsinki-Uusimaa	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
	Lappi	0	0	+	0	+	+	0	+	+	+	+	+	+	+	+	+	+	+	
	Satakunta	+	+	+	+	+	+	0	+	+	+	+	+	+	+	+	+	+	+	
France	Grand Est	+	-	+	-	+	0	0	+	+	+	+	0	+	+	+	0	+	0	
	Hauts-de-France	0	0	0	0	+	0	0	0	0	0	0	0	+	0		0	0	0	
	Normandie	+	0	+	0	0	+	0	+	+	0	0	+	+	+	+	+	+	+	
	Nouvelle Aquitaine	+	+	0	0	+	+	0	0	0	0	+	0	+	+	0	0	+	+	
Germany	Bayern	0	-	+	+	+	+	+	0	+	0	+	0	+	+	+	+	0	+	
	Berlin	+	-	0	0	0	0	0	0	0	0	+	0	-	0	+	+	+	0	
	Hamburg	0	-							+		+				+				*Better overhead funding for collaborative R&D projects*
	Saarland	0	-	+	-	0	0	-	+	+	0	+	+	+	+	+	+	+	0	
	Sachsen-Anhalt	+	+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Country	Region	More standardised data and methods to identify and evaluate clusters	Better methods to assess challenges due to many small clusters (e.g. in cases of fragmentation/ overlap)	Events for cluster matchmaking with clusters in Europe	Events for cluster matchmaking with clusters beyond Europe	Access to markets including international markets	Providing information on clusters in Europe	Providing information on clusters beyond Europe	Information on the upgrading and upscaling of industries and firms	Information on promoting new industrial activities	Information on promoting business-related service sectors	Information on improving framework conditions for cluster development	Information on start-up support within the cluster	Developing skills and human resources (e.g. higher education, vocational training)	Information on providing physical infrastructure (e.g. business incubators, technology parks, ICT)	Funding for R&D/innovation funds	Information on promoting digitalisation	Information on promoting business model innovation	Training for cluster management	Other
Italy	Lombardia	+	-	0	0	0	0	0	+	+	0	+	0	+	0	+	0	0	0	
	Piemonte	+	-	+	+	+	+	+	+	0	0	+	+	+	0	+	+	+	0	
The Netherlands	Limburg	+	0	+	+	0	+	0	0	+	-	+	0	+	+	+	+	0	+	
	Oost-Nederland	0	+	+	-	-	+	-	-	-	-	+	-	-	-	+	+	+	+	
Poland	Malopolskie	+	0	0	-	-	+	0	+	0	0	+	+	-	0	+	0	-	+	
	Podkarpackie	0	+	+	+	-	0	+	0	0	0	+	0	+	+	+	0	0	+	
	Podlaskie	0	0	0	+	0	0	0	0	0	+	0	0	+	+	+	+	+	+	
	Pomorskie	+	+	+	0	+	+	0		+	+	+	+	+	0	+	0	+	+	
	Slaskie	+	0	0	0	0	0	+	+	0	+	+	+	0	0	+	+	+	+	
	Zachodnio-pomorskie	0	+	0	0	+	0	0	+	+	+	+	+	0	0	+	0	+	+	
Portugal	Norte	+	+	+	+	+	0	0	0	0	0	0	0	+	+	+	0	0	+	
Romania	Nord-Est	+	0	+	-	+	0	0	+	+	+	+	+	+	+	+	0	+	+	
Spain	Andalucía	0	0	+	-	+	0	-	+	+	+	0	+	0	0	+	+	+	0	
	Cataluña	+	+	0	0	0	0	0	0	+	0	+	0	0	-	-	0	+	+	
	Navarra	+	+	0	-	+	0	0	+	+	+	+	0	+	0	+	+	+	+	*Funding and support for a network of policy makers to exchange best practices, train policy makers, create evaluation tools, policy assessment etc.*

Country	Region	More standardised data and methods to identify and evaluate clusters	Better methods to assess challenges due to many small clusters (e.g. in cases of fragmentation/ overlap)	Events for cluster matchmaking with clusters in Europe	Events for cluster matchmaking with clusters beyond Europe	Access to markets including international markets	Providing information on clusters in Europe	Providing information on clusters beyond Europe	Information on the upgrading and upscaling of industries and firms	Information on promoting new industrial activities	Information on promoting business-related service sectors	Information on improving framework conditions for cluster development	Information on start-up support within the cluster	Developing skills and human resources (e.g. higher education, vocational training)	Information on providing physical infrastructure (e.g. business incubators, technology parks, ICT)	Funding for R&D/innovation funds	Information on promoting digitalisation	Information on promoting business model innovation	Training for cluster management	Other
	Valencia	0	0	+	+	0	0	+	+	+	+	+	+	+	+	+	+	+	+	
Sweden	Skåne län	+	-	0	0	+	0	0	0	0	0	+	0	+	0	+	0	0	+	
	Stockholm	+	+	+	+	+	+	0	+	0	0	0	0	+	0	+	0	0	+	
United Kingdom	Derby, Derbyshire, Nottingham and Nottingham-shire	+	+	+	+	+	+	+	+	+	0	0	0	+	+	+	0	+	+	
	Northampto nshire	-	-	-	-	0	0	0	+	+	+	+	+	+	0	0	+	+	-	

Source: European Observatory for Clusters and Industrial Change, online survey on regional cluster programmes 2018 (37 answers for 36 regions). +: high/very high importance, 0: medium importance, -: no/little importance.

3.9 Main findings of regional experience in cluster support

Following the stocktaking of national cluster policies and programmes in European countries, this chapter 3 looked at a sample of European regions and their strategies for cluster support. The results are based on an online survey to regional stakeholders responsible for cluster support in their territories. The analysis is based on 54 responses from 49 regions in 16 European countries. With specific reference to cluster programmes, 55 current policy interventions in 27 regions and 12 countries were included in the analysis,[39] but regions that currently do not operate specific cluster programmes also frequently provide cluster support or did so in the past, or plan to design cluster support in the coming years.

The analyses show the high variety of the sample regions in terms of size, economic development (i.e. GDP/inhabitant) and industrial structure, which is greater than the variation at national level. An important reason relates to the different administrative or governance (NUTS) levels included: as the governance level for regional cluster policy varies across countries, results for NUTS1, NUTS2 and NUTS3 - and thus for different regional sizes - have been taken into consideration. Generally, the sample regions cover European countries in which cluster support through regional strategies or policies is implemented at the regional level.

Regional cluster support across Europe is delivered as part of different approaches, e.g. regional innovation strategies, specific programmes dedicated to cluster support or economic development programmes. To a large extent, regional cluster support is covered by European programmes, of which the European Structural and Investment Funds (notably Operational Programmes of the European Regional Development Fund) stand out. Regional cluster support is frequently delivered through regional programmes or through a combination of European, national and/or regional interventions.

The analysis shows that cluster support is an important element of regional economic and innovation policy. It has various objectives and is interlinked with a number of regional development goals. Very strong relationships exist with Smart Specialisation Strategies, but also with industrial policy, technology and innovation policies as well as business support and regional development. This shows the high degree of interaction of cluster support with regional fields of specialisation and with the economic development of European regions.

The most important objectives mentioned in the sample regions complementing the focus on small and medium-sized enterprises and cluster cooperation structures with

[39] However, in the case of four or more cluster programmes in place, the respondents were asked to listen the three most important ones.

industrial modernisation and innovation capacity. This proves that there is a high focus on the regional industrial fabric and its future orientation through modernisation and innovation. In addition, cluster policy interventions target the regional framework conditions as important territory-specific context for economic activities, research and innovation.

Similar to national cluster programmes, many interventions for regional cluster support address clusters in emerging industries and/or technologies as well as in mature industries, thus following a mixed approach of existing and new industrial activities. With specific reference to the support for small and medium-sized enterprises - that have an important role in the industrial fabric of European regions - existing industries and their collaboration across sectors are of the highest importance. A comparison with the national results indicates higher rankings for new and emerging activities at the country level. It can thus be assumed that regions have a strong focus on existing economic stakeholders and their collaboration, while national policies tend rather to direct national support to emerging (and risky) activities.

The great extent to which cluster support is embedded in the overall policy portfolio and its interlinkages with other regional economic development policies, as well as the range of measures and types of support which are granted to cluster activities show the strong focus on cluster- and region-internal collaboration and cohesion. This is further supported by the higher focus on further developing existing cluster organisations compared to the establishment of new ones. It can be concluded that joint competences and activities are given priority over the development of new ones in most of the sample regions.

Various types of support are provided to regional cluster activities, among which funding through grants are mentioned most often. Concerning funding sources for cluster programmes, regional, European and private funds are the most important sources of financing. Mostly, different funding sources are combined in order to provide the financial base of cluster programmes. Similarly, the funding of cluster organisations often relies on more than one source – with public funds and membership fees most frequently mentioned.

In accordance with the objectives and focus of regional cluster programmes, different types of actors are targeted. Most often, cluster support targets cluster organisations, frequently in addition to further stakeholders of the region. Some sample regions have an explicit focus on financing cluster organisations, while others target a broader range of actors, including private businesses, scientific and research institutions. This shows that some cluster programmes explicitly target industrial cluster members and their activities, while others rather focus on stakeholders that shape the regional ecosystem and thus have an indirect impact on cluster activities.

To conclude, cluster support remains an important policy instrument in Europe: all sample regions are going to maintain or increase their cluster policies. This again shows the high pertinence of clusters as a valuable instrument for regional economic development. In this respect, various initiatives are considered helpful for supporting the further development of cluster programmes, notably support for research and development and innovation.

4 International experience: Cluster programmes in selected non-European countries

This chapter presents selected cluster policy examples in non-European countries. This international view complements the stocktaking exercise of cluster policies and instruments in European countries and regions, and delivers additional insight into cluster approaches in countries beyond Europe.

The information presented in this chapter may also serve as background for dialogue and exchange processes between European and non-European countries, as well as in preparing possible cooperation activities between European and non-European clusters. Cluster cooperation on an international scale pursues the goal of contributing to growth both within and outside Europe. This is of interest both to cluster organisations and cluster members, particularly SMEs.

The non-European examples presented in this chapter include the United States of America, Canada, Brazil, Mexico, Israel, China, Taiwan, Singapore, Japan, and South Korea. Information on national cluster policies and programmes in these countries follows a similar structure in order to facilitate a comparative perspective across these countries and with the European examples (as presented in chapter 2).[40]

4.1 The United States of America

This section presents information on the national (i.e. federal) cluster policy in the United States of America and specifically covers the programme Innovative Economy Clusters.[41]

[40] Details on the methodology applied can be found in annex A.

[41] This section is based on the following sources: www.sba.gov/regional-innovation-clusters and www.sba.gov/cluster-data-taxonomy/ric concerning Regional Innovation Clusters;

http://barichbiz.com/barichalexander.com/agricultural-regional-innov/; www.biostl.org; http://e4carolinas.org/networks/carolinas-nuclear-cluster/; http://chfcc.org/; http://neesc.org/; http://www.magnolia-ba.biz/eigs; www.mistcluster.org/; http://smartgridcluster.com/; www.apeg.com/; https://www.clevelandplus.com/teamneo/services/clusters/; https://thewatercouncil.com/; www.migreenaviation.com/; www.defensealliance.com/; https://sdric.sdsu.edu/index.php; www.vcsi.org/; http://www.etvamerica.com/; www.uascluster.com/ that provide details on the clusters;

4.1.1 Development of the national cluster policy

The federal government has played an important and supportive role in the development of innovative clusters around the country. Federally funded research and military procurement have been instrumental in the emergence of clusters that have formed around major research universities. Through legislation, such as the 1980 Patent and Trademark Law Amendment Act known as Bayh-Dole Act, Congress has encouraged universities and national laboratories to commercialise federally funded research. Unlike many Asian and European nations, the United States does not, however, have a tradition of national policies promoting the development of particular industries in specific regions.

In recent years, support has grown for a more direct federal role in assisting and accelerating innovation clusters around the country. In part, the impetus for change has come from a National Academy of Sciences Report entitled ***Rising Above the Gathering Storm***,[42] which warned that the United States is in danger of losing global leadership in science, technology and innovation to nations with more ambitious and comprehensive policies to enhance their competitiveness. This resulted in 2007 in **Congress passing, with bipartisan support, the America COMPETES Act**. This Act includes authorisation - but not funding - to boost the development of innovation clusters. The impetus for change came also in response to the last economic downturn - the most severe in decades. Recognising clusters as important catalysts for creating jobs, for growing and creating small businesses, and forming new globally competitive industries, the US government has actively sought to develop federal-regional partnerships to foster cluster development.

As part of the Obama Administration's commitment to job creation and its refreshed Strategy for American Innovation[43], the Administration identified additional policies to

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www.sba.gov/about-sba/sba-newsroom/press-releases-media-advisories/sba-announces-support-10-regional-innovative-economies-clusters-local-job-creation; and www.sba.gov/content/innovative-economy-clusters that focus on the Innovative Economy Clusters programme ;

www.ncbi.nlm.nih.gov/books/NBK115046; www.eda.gov/archives/2016/news/press-releases/2012/05/29/advanced_manufacturing.htm; www.nytimes.com/interactive/2017/03/15/us/politics/trump-budget-proposal.html; and www.clustermapping.us/resource/topic/cluster concerning the United States' cluster policy;

www.clustermapping.us/resource/cluster-policy-guide-state-debate;

clustermapping.us/resource/clusters-and-economic-policy-aligning-public-policy-new-economics-competition; www.entrepreneur.com/article/225146.

[42] https://www.nap.edu/read/11463.

[43] National Economic Council and Office of Science and Technology Policy, *A strategy for American innovation*, October 2015, www.whitehouse.gov/innovation/strategy, pp. 3-5 and 59-61 on clusters.

sustain the innovation ecosystem. The Strategy recognised the role of the development of regional innovation ecosystems, clusters and supporting innovative entrepreneurs as part of its focus on fuelling the engine of private–sector innovation. Moreover, the strategy highlighted a number of new industrial priority areas of strategic opportunity [44] and was influenced by the report on *An Economy doing half its job*[45] by Porter and Rivkin, which emphasised the importance of workforce skills.

This resulted in a place-based approach to economic development and investments by the U.S. Administration of over USD 200 million promoting regional innovation clusters (investment announced in 2012). The U.S. cluster initiatives include the new *Regional Innovation Strategies* program, referenced in Obama's innovation strategy, the expansion of the *i6 Challenge* for proof-of-concept and commercialisation centres, the *Jobs and Innovation Accelerator Challenge Initiative* (that launched multiagency competitions for cluster-building manufacturing partnership projects), support for *emerging innovation ecosystems* and the US Cluster Mapping initiative.[46]

The Administration also created an interagency task force, known as the **Taskforce for the Advancement of Regional Innovation Clusters (TARIC)**, to develop and administer interagency grant competitions. More than a dozen federal agencies have participated in TARIC-led grant competitions by providing grant funding and other forms of support to the winners of the **Jobs and Innovation Accelerator Challenges (2012)**. The goal of the USD 26 million Advanced Manufacturing Jobs and Innovation Accelerator Challenge is to foster innovation-fuelled job creation through public-private partnerships.

These coordinated investments are meant to help catalyse and leverage private capital, build an entrepreneurial ecosystem, and promote cluster-based development in regions across the United States. They are being funded by a number of different government departments, such as the U.S. Department of Commerce's Economic Development Administration (EDA); the U.S. Department of Energy; the U.S. Department of Labor's Employment and Training Administration; the Small Business Administration; the National Institute of Standards and Technology (NIST); and the National Science Foundation (NSF).

The 2018 budget of the current Presidency however seems to go in an opposite direction, with cuts to R&D spending by approximately 5% from the previous budget's

[44] These include the following: Advanced Manufacturing, Industries of the Future, Health/Precision Medicine & Neuroscience, Advanced Vehicles, Smart Cities, Clean Energy and Energy Efficient Technologies, Educational Technology, Space, and Computing.

[45] http://www.hbs.edu/competitiveness/Documents/an-economy-doing-half-its-job.pdf.

[46] http://clustermapping.us/.

level. Instead of a triple helix approach, an exclusively private sector orientated R&D investment policy seems to prevail in which it is envisaged that the government will drastically reduce its involvement and clear the way for innovative businesses to fill the resulting void.

Similarly, the change of Presidency narrative from Obama's 'America is Open for Business'[47] to Trump's 'America First' foreign policy may also have an impact on the support for and/or perceptions of international cooperation opportunities.

4.1.2 The Innovative Economy Clusters programme

The ability of small businesses to drive innovation is critical to U.S. competitiveness. In recognition of the invaluable role small businesses play in the United States innovation ecosystem, the U.S. Small Business Administration (SBA) launched the "*Regional Innovation Cluster*" (RIC) Initiative in September 2010. This initiative promotes and supports industry clusters - geographically concentrated groups of interconnected businesses, suppliers, service providers, and related institutions in a particular industry or field - that have been associated with increased regional economic growth.

The 10 Innovative Economies awardees selected from among 173 applicants to participate in the pilot programme represented a wide range of diverse geographic areas and industries. From urban to rural and clean energy to robotics, the applicants focused on leading research and commercialising new products.

SBA is supporting two types of innovative economies: Regional Innovation Clusters and Advanced Defence Technologies. The seven Regional Innovation Clusters focus on providing business training, commercialisation and technology transfer services, counselling, mentoring and other services that support the growth and development of small businesses in the cluster region. The following seven Regional Innovation Clusters were initially selected:

- Project 17 Agricultural Technology Cluster;
- The Carolinas' Nuclear Cluster;
- The Northeast Electrochemical Energy Storage Cluster;
- The Enterprise for Innovative Geospatial Solutions Cluster;
- The Illinois Smart Grid Regional Innovation Cluster;
- The Northeast Ohio Technology Coalition; and
- The Upper Michigan Green Aviation Coalition.

[47] https://www.commerce.gov/sites/commerce.gov/files/media/files/2014/doc_fy2014-2018_strategic_plan.pdf.

The SBA has worked with the U.S. Department of Defense (DoD) to identify areas around the country where regional innovation clusters can help meet critical defence technology needs. Three of the Advanced Defense Technology awardees focus on providing business training, counselling, mentoring, matchmaking and other services to small businesses that focus on critical DoD technologies.

The Advanced Defense Technologies clusters originally chosen were:

- The Defense Alliance of Minnesota (Advanced Power and Energy Cluster);
- The San Diego Advanced Defense Cluster; and
- The Huntsville Advanced Defense Technology Cluster.

All clusters are public-private partnerships consisting of venture capitalists, enterprise, education, and research partners. Most clusters have set up a specific consortium administration leading the effort, while some have a venture capital lead partner and others a public organisation (education/R&D lead partner).

4.1.3 Objectives, measures and focus of the cluster programme

SBA's funding will be provided to each cluster's organising entity to strengthen opportunities for small businesses within the cluster. The funds can be used to provide services, including mentoring and counselling small businesses, as well as to attract more small business participation.

In addition to the ten initial clusters mentioned above, eight further clusters have been selected for support. Each cluster has a specific sectoral focus:

- Agriculture Innovation Cluster (AIC; Monterey – Santa Cruz – San Benito, Calif.) The AIC focus is on agricultural innovation, including production, related physical and human capital infrastructure, and leading-edge agriculture research. This project was envisioned to be a truly regional economic development programme;
- BioSTL Bioscience Cluster (St. Louis), which pursues the objective of carrying forward bioscience company creation and driving economic growth in St. Louis. A specific focus is on increasing the region's capacity to support entrepreneurs and on boosting economic activity in the medical and plant biosciences;
- Carolinas' Nuclear Cluster, which provides strategy, structure, and on-the-ground execution to grow the North and South Carolina businesses that serve the nuclear energy industry. The Carolina Nuclear Cluster fosters collaboration among members through seminars, networking, research, economic development and opportunity sharing;
- The Connecticut Hydrogen-Fuel Cell Coalition, administered by the Connecticut Center for Advanced Technology, works to enhance economic growth by

developing, manufacturing, and deploying fuel cell and hydrogen technologies and associated fuelling systems;

- Northeast Electrochemical Energy Storage Cluster covering New York, New Jersey and the New England States. This is a network of industry, academic, government and non-governmental leaders working together to help businesses that provide energy storage solutions. The cluster is administered by the Connecticut Center for Advanced Technology, Inc. (CCAT);
- The Ozarks Cluster located in Arkansas. The Ozarks Regional Innovation Cluster (ORIC) supports start-ups and small businesses that are innovating around and within retail, consumer packaged goods, supply chain/transportation/logistics, food, and data. ORIC provides one-to-one mentoring, sponsors events and workshops, and facilitates capital access through close relationships with lenders and venture capitalists;
- Enterprise for Innovative Geospatial Solutions (EIGS) Cluster that coordinates the interaction among high-tech geospatial companies, university research programmes, state agencies, and other related organisations in order to grow the geospatial businesses into a world-class industry group. EIGS provides specific business services to existing companies, recruits complementary businesses and talent, facilitates research opportunities, and supports activities to ensure that an educated, well-trained workforce is available to address the growing development needs of this industry;
- MIST - Marine Industry Science and Technology Cluster, located in Mississippi. MIST is involved in the development and implementation of applied technologies for operating in, working around, and monitoring the marine and coastal environments, and supports marine industries (commercial and recreational fishing, shipbuilding, defence, aquamarine culture, off shore oil and gas, and environmental restoration, recovery, etc.);
- Illinois Smart Grid Regional Innovation Cluster, a collaboration of more than 100 entities (including 70 businesses) in the Chicago region, focused on the acceleration of Smart Grid innovation, deployments, and new market development;
- The Wood Products Cluster located in the Appalachian Ohio Region. The cluster targets the region's wood products industry and pursues the aim to bring wood products manufacturers together;
- NorTech (Ohio) focuses on technology-based economic development in 21 counties of Northeast Ohio. NorTech currently focuses its innovation efforts on Smart Devices and Systems/Internet of Things, Additive Manufacturing and Energy Storage;
- The Water Council Cluster in Milwaukee, Wisconsin. The cluster supports more than 180 members with services, programming and networking opportunities;

- Upper Michigan Green Aviation Coalition. Its mission is to join private and public sector partners across the Upper Peninsula of Michigan and bordering regions, with experts from throughout the world, to develop new business opportunities, develop and commercialise advanced technologies, promote collaboration among cluster partners, etc. within the field of green aviation;
- Defense Alliance of Minnesota, the Upper Midwest's defence and homeland security network. Its mission is to network and expand the defence and homeland security industries, and to further promote the region's contributions to the armed forces;
- San Diego Advanced Defense Cluster, which focuses on autonomous systems and cyber security, as well as other technologies applicable to defence needs;
- Von Braun Center for Science and Innovation, located in Huntsville, Alabama. The Centre's primary focus is aero-space technology with applications for the National Aeronautics and Space Administration (NASA), the Department of Defense (DoD), and the National Oceanic and Atmospheric Administration (NOAA). It pursues the mission of collaborative research, support of university research, and formation of employment and economic development in Huntsville, the whole state of Alabama, and the Region of Tennessee Valley;
- The Autonomous and Unmanned Systems Cluster in Alamogordo, New Mexico, a collaborative enterprise of business, academia, and government. Its members target the development, manufacture and application of advanced unmanned system solutions and their enabling technologies;
- Unmanned Aerial Systems (UAS) Cluster in Oklahoma and Kansas. This cluster is dedicated to growth of the United States Unmanned Aerial System industry by enabling established companies and emerging entrepreneurs connect, work together, and gain access to national technology, global capital, advanced business models and global markets.

4.1.4 Achievements and further development of the national cluster policy

As explained above, from the initial ten funded clusters there are eight additional/spin-off clusters almost doubling the amount of funded clusters. This is both for the SBA funded Regional Innovation Clusters and the joint SBA & DoD funded Defense Technology oriented clusters.

Since the inception of the RIC Initiative, the SBA has prioritised the robust evaluation of its cluster investments and pioneered performance measurement of federally funded cluster initiatives. In many cases, the economic activity associated with SBA-supported clusters exceeds (sometimes considerably) corresponding benchmarks. For example, between years 2 and 3, the average total employment and the average revenue of small

businesses that participate in the clusters grew at an annualised rate of 6.9%, at least twice the rate of benchmark firms; average monthly payroll in cluster small businesses grew at an annualised rate of 14.1%, exceeding benchmarks by 11 percentage points.

The USA does not seem to have deviated from the course taken by the previous Administration, and is currently still working with these programmes through the EDA, SBA, NSF, DoD, SBIR and others.

Summary box on U.S. cluster policy

Innovative clusters receive high attention in the innovation policy of the United States' federal government. Of specific importance is the focus on small and medium-sized enterprises, in order to boost competitiveness and growth. At the core of cluster policy is the Innovative Economy Clusters programme. In its pilot phase, ten innovation clusters - from which seven regional innovation and three advanced defence technology clusters - were selected. Eight additional clusters were selected later. They benefit from public funding for providing a range of services to support growth and development of small businesses that join the clusters.

4.2 Canada

This section presents information on the cluster policy in Canada and has a specific focus on the Innovation Superclusters Initiative (ISI). It draws both on available documents[48] and answers to the European Observatory for Clusters and Industrial

[48] www.competeprosper.ca/clusters/data; https://localideas.files.wordpress.com/2014/05/cluster-atlas.pdf; www.clustermap.ca/ concerning industrial clusters in Canada, the Canadian cluster data, the Canadian Cluster Atlas, and the Canadian cluster map;

www.ic.gc.ca/eic/site/093.nsf/eng/home; www.ic.gc.ca/eic/site/093.nsf/eng/00003.html#toc-01.01; www.ic.gc.ca/eic/site/093.nsf/vwapj/Supercluster_Program_Guide-PhaseII-EN.pdf/$file/Supercluster_Program_Guide-PhaseII-EN.pdf; www.ic.gc.ca/eic/site/093.nsf/eng/00007.html; and www.ic.gc.ca/eic/site/093.nsf/vwapj/Superclusters_Applicant_Guide_II_EN.pdf/$file/Superclusters_Applicant_Guide_II_EN.pdf that deliver insight into the Innovation Superclusters Initiative, the programme website, the programme guide, and the applicant guide;

www.ic.gc.ca/eic/site/080.nsf/eng/home that provide details on Canada's cluster policy;

National Research Council Canada (1996) Regional/Local Industrial Clustering: Theory and Lessons from Abroad, National Research Council, Ottawa;

National Research Council Canada (2002a) Science at Work for Canada: Vision 2006, National Research Council, Ottawa;

and the websites of Canada's new superclusters: https://www.digitalsupercluster.ca/; https://www.ic.gc.ca/eic/site/093.nsf/eng/00011.html (Digital Technology Supercluster); https://www.proteinindustriescanada.ca/; https://www.ic.gc.ca/eic/site/093.nsf/eng/00012.html (Protein Industries Supercluster); http://www.ngen.ca/; https://www.ic.gc.ca/eic/site/093.nsf/eng/00010.html (Advanced Manufacturing Supercluster); https://aisupplychain.ca/; https://www.ic.gc.ca/eic/site/093.nsf/eng/00009.html (SCALE.AI Supercluster), and

Change's questionnaire to representatives of cluster policies in non-European countries.

4.2.1 Development of the national cluster policy

Canada is home to world-class innovation and industrial clusters, with strong technology leadership, and Canada's industrial clusters are engines of innovation that support the development and growth of globally competitive Canadian companies. The Government of Canada is committed to strengthening Canada's most promising clusters further so that they continue to develop and attract the best ideas, brightest talent and capital necessary for success. At the moment Canada has, apart from the supercluster initiative, 51 traded and 16 local clusters.

However, companies are grappling with an unprecedented rate of change. To remain competitive and in order to build a shared advantage, firms must partner in new ways. Canadian industry – whether they are start-ups, small and medium-sized enterprises (SMEs), or large corporations – look to multi-sector collaboration, open innovation, and partnerships with researchers, post-secondary educational institutions and other innovators.

One of the policy instruments available to the government within the innovation policy spectrum is the use of clusters (cluster policy). Canada's National Research Council has been a proponent of cluster-based STI (science, technology, innovation) development since the mid-1990s and the Council has since launched a number of initiatives to support the growth of innovative enterprises clustered around research institutes and universities.

Recognising the need for further development of this policy, the government has stepped up its input with the launching of Innovation Canada and the superclusters and connected regional clusters programmes. These cluster programmes capitalise on a concentration of assets (research institutions, academia, start-ups, industry, government assets, incubators/accelerators, etc.). Clusters can furthermore be virtually (sector or expertise driven) or geographically concentrated (often multi-sector). Anchor organisations (innovation champions) are necessary to concentrate the effort, and Canada is looking at strengthening those clusters that have the potential to be truly outstanding on a global scale, competitiveness wise, through its Innovation Superclusters Initiative.

https://oceansupercluster.ca/; https://www.ic.gc.ca/eic/site/093.nsf/eng/00013.html (Ocean Supercluster).

4.2.2 The Innovation Superclusters Initiative (ISI)

As part of the Innovation and Skills Plan - an agenda to spark growth and help Canada realise its potential as a global leader in innovation - Canada is funding business-led innovation superclusters, through the Innovation Superclusters Initiative. This is an initiative at the national level that will run for 5 years, from 2018-2023.

Superclusters should make it easier for innovators and potential customers to harness the strengths of their local ecosystems by working closely together on research, development and demonstration activities that will lead to major commercial opportunities and boost productivity across industries, creating jobs and driving economic growth. Reflecting the answers to the European Observatory for Clusters and Industrial Change's questionnaire, the development and growth of superclusters will support the health of the Canadian economy by:[49]

- Increasing competitiveness of small and medium-sized enterprises (SMEs);
- Strengthening cooperation between companies or between industry and science/research;
- Fostering innovation capacity;
- Fostering R&D activities; technology development and implementation;
- Strengthening innovation ecosystems in specific regions;
- Supporting internationalisation activities;
- Promoting entrepreneurship, start-ups and spin-offs;
- Promoting scale-ups (firms with high growth);
- Enhancing the visibility of clusters; and
- Promoting social economy and other solidarity-based initiatives for local development strategies.

The Innovation Superclusters Initiative is investing up to CAD 950 million, over five years, to support business-led innovation superclusters with the greatest potential to energise the economy and become engines of growth. Through a small number of high-value, strategic investments, this initiative is co-investing with industry in bold and ambitious proposals in order to strengthen Canada's most promising clusters and build superclusters at scale.

This initiative is a first of its kind for Canada, fostering stronger connections - from large anchor firms to start-ups, from post-secondary institutions to research and government partners - and opening the door to new forms of industry partnership. It

[49] Source: answers to the European Observatory for Clusters and Industrial Change's questionnaire.

represents a significant commitment to partnering with industry and supporting the success of leading domestic and global companies that choose to innovate in Canada.

4.2.3 Objectives, measures and focus of the Superclusters Initiative

Innovation superclusters were selected following a two-phase application process. Funding is being delivered to industry-led consortia with strategic plans to:

- Build a shared competitive advantage for their cluster that attracts cutting-edge research, investment and talent by addressing gaps, aligning strengths, enhancing attributes, and positioning it as a world-leading innovation hotbed;
- Increase business expenditures on research and development (R&D) and advance a range of business-led innovation and technology leadership activities that will address important industrial challenges, boost productivity, performance and competiveness for Canada's sectors of economic strength;
- Generate new companies, and commercialise new products, processes and services that position firms to scale, connect to global supply chains, transition to high-value activities and become global market leaders; and
- Foster a critical mass of growth-oriented firms, and strengthen collaborations between private, academic and public sector organisations pursuing private-sector led innovation and commercial opportunities to enhance the cluster's pool of resources, capabilities and knowledge.

Proposals are built on shared private sector commitment - demonstrated through matched industry funding - with the aim of leveraging strengths, addressing innovation gaps, and bringing innovation ecosystem players together to work more strategically for the collective benefit of their supercluster.

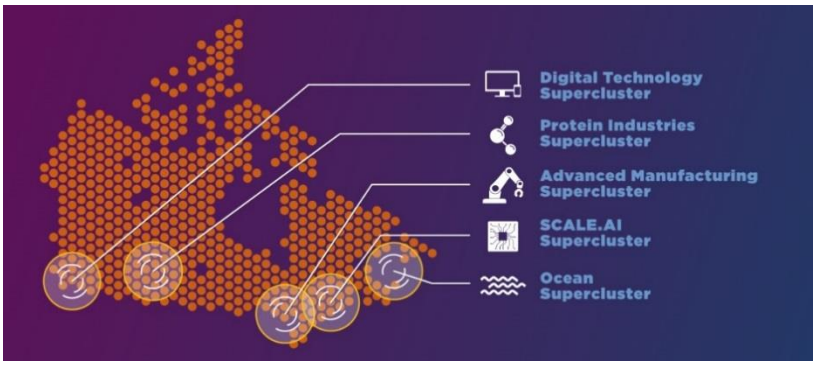
The main measures are funding, intellectual property management, (non-financial) technical assistance, and networking. The ISI will provide up to CAD 950 million to match industry contributions to fund a small number of business-led innovation superclusters. It is expected that the contribution amount per applicant under the ISI will normally be between CAD 125 million and CAD 250 million for the duration of the Contribution Agreement. However, the number and amount of awards may vary depending on the nature of applications received. Funding delivered through the ISI will be provided in the form of non-repayable contributions (subsidies).

In relation to Intellectual Property Management, the Government of Canada will make no claim to ownership of intellectual property resulting from activities that it funds. Ownership of entity-supported intellectual property is to be determined by applicable Canadian law, and the policies and contractual arrangements of the relevant entity. In principle, entity-supported intellectual property can be owned by any of the following

and in any combination: the entity itself; for-profit entity members; academic entity members; other entity members (e.g. not-for-profit organisations).

Contracts granting entity members the right to access entity-supported intellectual property must prove that such rights will be unaffected by any sale, transfer, or licensing of the intellectual property.

Within ISI, a number of cluster support measures are of importance: establishing new cluster management organisations; support for testing, proof-of concept, prototyping, and demonstration projects; supporting small and medium-sized business (SME) participation in the clusters, as shown by the minimum requirements for participating consortia; providing and supporting clusters' public relations (PR); supporting cross-sectoral collaboration; supporting activities of the cluster to promote entrepreneurship; financing start-ups and fostering gazelles and scale-ups; and establishing cluster-specific infrastructures.



The Superclusters Initiative does not have a specific sectoral or technological focus. It addresses both mature and emerging fields. The five superclusters selected represent the following fields/areas:

- Based in British Columbia, the Digital Technology Supercluster will use bigger, better datasets and cutting-edge applications of augmented reality, cloud computing and machine learning to improve service delivery in the natural resources, health and manufacturing sectors. Employing digital technologies will save time and money and improve the health and lives of Canadians;
- Based in the Prairies, the Protein Industries Supercluster will use plant genomics and novel processing technology to increase the value of key Canadian crops, such as canola, wheat and pulses that are desirable commodities in high-growth foreign markets, such as China and India, as well as to satisfy growing markets in North America and Europe for plant-based meat alternatives and new food products;
- Based in Ontario, the Advanced Manufacturing Supercluster will build up next-generation manufacturing capabilities, incorporating technologies like advanced robotics and 3D printing;

- Based in Quebec, the AI-Powered Supply Chains Supercluster (SCALE.AI) will bring the retail, manufacturing, transportation, infrastructure, and information and communications technology sectors together to build intelligent supply chains through artificial intelligence and robotics. This supercluster will help Canadian small and medium-sized businesses scale up and help ensure Canada is a globally competitive export leader;
- The Ocean Supercluster will harness emerging technologies to strengthen Canada's ocean industries - industries like marine renewable energy, fisheries, aquaculture, oil and gas, defence, shipbuilding, and transportation. It is located in Atlantic Canada, and focuses on digital sensors and monitoring, autonomous marine vehicles, energy generation, automation, marine biotechnology and marine engineering technologies.

4.2.4 Achievements and further development of the national cluster policy

Although the Innovation Superclusters Initiative is still in its start-up phase, some clusters have already progressed to phase 1 with project proposals. With a focus on job creation, the Innovation Supercluster Initiative is expected to create 50,000 jobs and GDP growth of CAD 50 billion over ten years.

Summary box on Canadian cluster policy

Canada has a long tradition of cluster policies. As part of its Innovation and Skills Plan, Canada launched the Innovation Superclusters Initiative, which is supporting five large, innovative, business-led superclusters that are expected to boost economic development and growth. Superclusters are paving the way for new forms of industry partnerships to evolve. Funding results from public-private co-investments in industry-led consortia that have developed strategies to jointly target research and development activities, technology leadership, commercialisation, start-up creation, collaboration and growth, ultimately building significant competitive advantages through attracting research, competences and investment.

4.3 Brazil

The following section presents cluster policy in Brazil and in particular the concept of Local Production Systems (*Arranjos Produtivos Locais, APL*). In addition to the relevant

literature and websites,[50] this section refers to information collected through an interview with the Head of the APL Division, Ms. Maria Cristina de A.C. Milani.

4.3.1 Development of the national cluster policy

The emergence of Local Production Systems *Arranjos Produtivos Locais* [51] (APLs) started in the 1990s and spread rapidly. The concept of APLs was first introduced in the Brazilian government's 2003 Industrial, Technological and Foreign Trade Policy (PITCE). APLs were linked then to the promotion and development of integral actions to boost SMEs, a role that evolved in the following years. From 2004 onwards, APLs were included in the successive Plurennial Plans of the federal government, which also established the Standing Working Group for the APLs *Grupo de Trabalho Permanente para Arranjos Produtivos Locais*[52] (GTP-APL).

An APL can be defined as an agglomeration of companies operating within the same territory, sharing a productive specialisation and maintaining close links for interaction, cooperation and mutual learning, as well as with other local stakeholders such as government, business associations, financing institutions, universities and RDI organisations. Some APLs are represented by formal cluster organisations, but many cluster communities are represented by public and/or private associations.

The objective of the National APL Policy is to stimulate local development processes by promoting the competitiveness and sustainability of entrepreneurial activities in the APL territories. The main goals pursued are economic development, narrowing of social and regional inequalities, technological innovation, employment and wealth growth,

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[50] Made e Vellasco, F. (2012) APLs como Estratégia de Desenvolvimento. Coordenação Geral de Arranjos Produtivos Locais; http://sedeme.com.br/portal/download/oficinas/apl-como-estrategia-de-desenvolvimento-gtp-apl.pdf;

Ministério da Integração Nacional (MI), www.mi.gov.br/web/guest/desenvolvimento-regional;

Governo Federal do Brasil (2003) Diretrizes de Política Industrial, Tecnológica e de Comércio Exterior, https://old.abdi.com.br/Estudo/Diretrizes_PITCE.pdf;

Grupo de Trabalho Permanente para Arranjos Produtivos Locais – GTP APL, http://portalapl.ibict.br/apls/;

European Cluster Collaboration Platform (2017) Preparatory Briefing Brazil, www.clustercollaboration.eu/sites/default/files/d3.2_preparatory_briefings_brazil_20181106.pdf;

European Cluster Collaboration Platform (2017) Discussion Paper Brazil, www.clustercollaboration.eu/sites/default/files/discussion_paper_brazil.pdf;

Ministério da Indústria, Comércio Exterior e Serviços (MDIC), www.mdic.gov.br.

[51] Arranjos Produtivos Locais (APLs) is the term used to denominate clusters in Brazil, and translates into Local Production Systems.

[52] Grupo de Trabalho Permanente para Arranjos Produtivos Locais (GTP-APL) - Working Group for APL.

reduction in the rate at which SMEs fail, and increased productivity and competitiveness.

This variety of objectives translates into an APL policy which is rather fragmented because APLs have been considered crucial elements for the successful implementation of a wide range of policies attached to different government departments. For instance, the National Policy for Regional Development is one of the axes that determines the scope and general guidelines of the policy action in APLs.

Consequently, the National APL Policy needs to be aligned with major governmental plans and their long-term objectives as much as with the states' own policies. The GTP-APL serves as a converging interface between the different levels and aims to involve APLs.

4.3.2 Brazilian cluster support through the GTP-APL

There is no specific cluster programme in Brazil but the Standing Working Group for the APL - Local Production Systems (GTP-APL) has been operating since 2004. Even though it is coordinated by the Ministry of Development, Industry and Foreign Trade (MDIC), the GTP-APL is the core body responsible for the APLs and, as such, it has deep roots in different policies related to them i.e. RDTI, regional development, entrepreneurship, and so on.

Its main responsibilities are to identify existing APLs; draw up general guidelines for coordinating government actions in support of APLs through the country; define joint action criteria for consolidating and supporting APLs; propose a cross-sectoral management model for federal government actions; and build an information system to ease the generation of support actions for APLs.

The GTP-APL works at local, regional and national levels, both with emerging and mature clusters. It also works with different organisations related to APLs. Due to its significance, it is expected that the GTP-APL will continue to play a significant role although the focus will probably change.

4.3.3 Objectives, measures and focus of the cluster programme

The core objectives of the GTP-APL are to strengthen innovation ecosystems in specific regions and to enhance the visibility of clusters. The following goals are also important: increasing the competitiveness of SMEs; strengthening cooperation between companies, industry and science/research; fostering innovation capacity; supporting internationalisation activities; and, promoting social economy and other solidarity-based initiatives for local development strategies.

The GTP-APL provides a range of support measures, often in collaboration with other organisations, such as government bodies, universities or RDI centres. Among the measures that can be encompassed in its framework, the most important aim to:

- Further develop existing cluster management organisations;
- Support SMEs' participation in clusters;
- Support international and cross-sectoral cluster collaboration; and,
- Establish cluster-specific infrastructures and promote digitalisation.

Also important, but to a lesser extent, are technical assistance (consultancy, training, cluster management excellence), supporting the internationalisation of the cluster's activities, promoting entrepreneurship, business model innovation, a new culture of cooperation and governance involving different stakeholders and eco-efficiency, as well as supporting the clusters' PR activities.

Financial instruments are also made available in cooperation with funding institutions and agencies. APLs, research institutions and science and technology parks are the only organisations eligible to apply. This is sometimes highly dependent on the state but there are free networking events, as well as calls to finance start-ups or R&D projects of cluster members. The GTP-APL does not have any specific technological or sectoral focus.

4.3.4 Achievements and further development of the national cluster policy

A major achievement has been the creation of the APL Observatory (OBAPL), the official database of APLs. The Observatory is a mapping tool focussing on the Brazilian cluster communities, which provides information on the cluster environment, geography, sectors and main cluster cities, among others. As of 2017, there were 774 APLs in Brazil, mainly concentrated in the southern regions of the country.

In addition, the State support centres for APL *Núcleos Estaduais de apoio aos APLs*[53] (NEs) were created to facilitate dialogue and coordination between the GTP-APL and the APLs at state level. NEs play a key role in the drafting of Development Plans (PD) for APLs since they can mobilise local stakeholders, provide first-hand knowledge about the local realities, accompany, monitor and evaluate the implementation of the PDs and report results, as well as needs and demands to the GTP-APL. There are 27 NEs.

[53] Núcleos Estaduais de apoio aos APLs translates to State Nucleus for supporting APLs.

The unstable situation experienced by Brazil in recent years has affected the normal course of policy making, including that of APLs.

In 2018, the Ministry of National Integration launched the National Integration Routes as part of its National Policy for Regional Development. These Routes are networks made up of territorially and sectorally interconnected APLs, which promote innovation, differentiation, competitiveness and benefits for the members by means of synergies and convergent actions on the part of the development agencies. Ultimately, these should help to achieve the productive inclusion and economic integration of less developed regions in the country both in national and international markets.

Summary box on Brazilian cluster policy

Though Brazil does not have a specific cluster programme, the concept of Arranjos Produtivos Locais (APL) is closely akin to cluster support. Brazil's national APL policy has a long tradition and clearly focuses on SME support and local development, with the support of regional innovation ecosystems and cluster visibility being at the core of national efforts. The rather horizontal goals and missions of this policy are aligned with vertical government programmes on the one hand, and with individual state policies on the other hand - APL policy thus has an interfacing role between different governance and strategic levels. As part of its recent policy for regional development, the national government works with interconnected established APLs in order to pursue the current objectives of regional development policy. This again emphasises the role and strategic importance of successful Local Production Systems for achieving economic development goals.

4.4 Mexico

This section is dedicated to cluster policy in Mexico and Project iCluster. It benefits not only from various sources and publicly available information, [54] but also from

[54] https://icluster.spribo.com (iCluster Ecosystem of Innovation);

www.inadem.gob.mx (INADEM);

www.promexico.mx (ProMexico);

European Cluster Collaboration Platform (2017) Preparatory Briefing Mexico, https://www.clustercollaboration.eu/sites/default/files/mexico_preparatory_briefing.pdf;

European Cluster Collaboration Platform (2017) Discussion Paper Mexico, https://www.clustercollaboration.eu/sites/default/files/discussion_paper_mexico.pdf;

www.isc.hbs.edu/competitiveness-economic-development/frameworks-and-key-concepts/Pages/clusters.aspx (Clusters in Mexico);

www.icluster.inadem.gob.mx/index.php?idioma=esp (Instituto Nacional de Estadística y Geografía);

Alfredo Sanchez, Co-Chair of Innovation Clusters Subcommittee of the Mexico-United States Entrepreneurship and Innovation Council, Chairman QoS Labs – iCluster presentation (2017) www.2017.insme.org/presentations/17.AlfredoSanchez.pdf.

information collected through the European Observatory for Clusters and Industrial Change's questionnaire for cluster policies in non-European countries, answered by Mr Miguel Lot Helguera, manager of the Baja California Cluster in Mexico.

4.4.1 Development of the national cluster policy

In Mexico, clusters are defined as a geographic concentration of interconnected companies, suppliers, and associated institutions in a particular field. These can be of two types: i) a number of companies that cooperate with the aim of delivering orders to large customers and that are associated with supporting institutions; and, ii) companies of equal status concentrated in the same state that only interact with suppliers and support institutions.

Mexico does not have a policy specifically targeting clusters at either federal or state level. Nevertheless, there are several initiatives aimed at fostering cluster activity.

At federal level, the Mexican government has launched several programmes which cluster organisations in any phase of the life cycle can access. The topics and, therefore, the organisation responsible for the implementation, differ each year, although the programmes often include financing, consulting, workshops, training and networking. The National Secretariat for the Economy (Secretaría de Economía) is the reference organisation in the development of cluster policies, which are seen as closely related to industry, competitiveness and innovation. This Secretariat also manages the European Secretariat for Cluster Analysis (ESCA) labelling system in Mexico.

In addition, the National Institute for Entrepreneurs (INADEM), within the Ministry of the Economy, aims to implement, execute and manage policies that support SMEs and entrepreneurs, promoting innovation and competitiveness. This is sometimes open to cluster organisations. ProMéxico [55] encourages internationalisation and provides services to facilitate the process. Even though these services are mainly directed at SMEs, clusters might make use of them too.

At state level, the State Secretary for Developing Economy is the key public stakeholder. Cluster policies are managed rather autonomously, with each state formulating their own programmes and initiatives to strengthen the state clusters. The promotion of entrepreneurship and competitiveness by establishing synergies and integrating SMEs in a value chain is among the most important objectives. The involvement of the public sector and academia is important as well. Internationalisation, on the other hand, does not seem to be a particular priority.

This generalised absence of consistent policy guidelines makes cluster organisations the main drivers of industrial development. Mexican clusters often collaborate with

[55] Mexico's Organisation for Investment and Trade.

each other to enhance their competitiveness on the global scene, and in some cases, they are organised around very strong cluster organisations or business associations that set the roadmaps and the pace.

4.4.2 Project iCluster

Mexico has an important and well-established community of clusters. According to ProMéxico, there are currently 155 clusters representing nine sectors throughout the country. The main founding sources of cluster organisations are public funding and RDTI projects of cluster members.

Project iCluster (2014) is intended to boost regional economic development through clusters in Mexico and the United States. To achieve this, it intends to build an ecosystem that facilitates and optimises the collaboration between government, industry and academia to foster innovation and entrepreneurship.

iCluster identifies and promotes high-impact projects through innovation clusters along one core initiative (sustainable economic development) and four cross-cutting initiatives (international cooperation, high-impact entrepreneurship, gender equality and digital transformation), which intersect in common entrepreneurship and innovation knowledge flows.

The project involves the participation of several high-level institutions and allied organisations representing government, academia, research and industry, as well as regional and sectoral expert groups. The implementation is led and co-financed by the INADEM, within the Ministry of Economy.

Project iCluster targets both emerging and mature clusters, but membership is only granted to organisations that contribute to the achievement of the strategic objectives of the iCluster Ecosystem.

4.4.3 Objectives, measures and focus of the cluster programme

The core objective of Project iCluster is to identify regional assets and create the necessary connections between the public and private sector through clusters, constituting an ecosystem that fosters innovation and entrepreneurship and enhances the clusters' visibility, ultimately contributing to regional development.

Furthermore, iCluster seeks to offer strategic information to key organisations; increase the involvement and contributions of Mexican companies in global value networks; and, attract investment, as well as measuring its impact in innovation in terms of competitiveness, productivity and economic growth in the global market. This is expected to benefit entrepreneurs, SMEs and the overall business environment, guiding Mexico into a globally competitive knowledge economy.

Project iCluster offers the following support measures:

- Commercial intelligence services: corporate intelligence, productive chaining, commercial opportunities, industrial performance, technology oversight, new products;
- SME online promotion, e.g. publication of business stories focused on a market approach characterisation that helps to promote SMEs;
- Expert working groups and knowledge networks in cluster mapping, regional development, technology trends, gender equality and high-impact entrepreneurship;
- Online resources: news, events, publications and links of interest;
- Online communities to foster a favourable business environment around regional value networks;
- Mapping tool: mapping of the Mexican cluster community compatible with the US Cluster Mapping, allowing for the identification of clusters present in both countries.

Cluster mapping promotes regional development by collecting crucial data for boosting global and regional value chains, making sustained investment decisions and boosting regional evidence-based public policy. Furthermore, it eases the elaboration of cross-border strategies for economic development.

The project does not have a sectoral focus as such, although the Regional and State Innovation Agendas determine their respective sectoral priorities.[56]

4.4.4 Achievements and further development of the national cluster policy

The following achievements can be highlighted:

- 22 workgroups convening experts and users from different regions, which deal with cluster mapping, regional development, technology trends, gender equality and high-impact entrepreneurship;
- Mexican Technology Platform Agenda 2016, including four technology trends: smart cities, new media, energy and industry 4.0;
- Publication of the INEGI (2016) – national cluster map;
- Smart specialisations: value network mapping provides a regional view of strategic sectors - (bi)national region characterisation, regional economic structure and (bi)national cluster identification;
- Global Value Chains: identification of strategic sectors and associated establishments that form part of the value network;

[56] Mexico has adopted a smart specialisation approach, which was applied in the development and implementation of Innovation Agendas, at regional and state level, see www.agendasinnovacion.org.

- Binational Value Networks: identification of binational industrial corridors and associated establishments, i.e. Binational initiative for the Regional Economic Development of the Industrial Corridor Monterrey-Saltillo-Texas;
- National lCT cluster capabilities mapped to regional smart specialisations;
- Knowledge economies: smart city strategic agendas to trigger innovation projects that can be supported by SMEs, i.e. Smart City Querétaro;
- Collaboration on innovation and internationalisation of cities (Conecta 2020 and Allas Project);
- Dissemination: over 10,000 entrepreneurs participating in an online pilot community. Coordination and/or participation in more than 100 events and over 400 meetings with relevant organisations;
- Gender equality: over 1,000 women participating in an online entrepreneurship community.

Despite the lack of efficient competitiveness policies, coordinated approaches to address regional development and the relevance of the Mexican cluster community, the government has not displayed any intention of developing a cluster policy. Some voices, however, emphasise the importance of designing a cluster policy or at least, an industrial policy that identifies priority sectors (clusters) and analyses how introducing supporting measures impacts the economic growth and the regional development, among others.

Summary box on Mexican cluster policy

Mexico does not have a dedicated cluster programme, but fosters cluster activities through several other initiatives. Cluster organisations are eligible for funding in various public programmes. Mexico's cluster support targets the objectives of industrial development, competitiveness and innovation. A specific characteristic of Mexico's cluster support is the important role of strong cluster organisations or business associations at both the strategic and operational level, due to the absence of national cluster policies. In addition to national support in public programmes, each state defines own initiatives and programmes. Project iClusters targets economic development through cluster collaboration between Mexico and the United States, the main focus being regional economic development through favourable ecosystems for supporting innovation and entrepreneurship. Binational cluster collaboration in smart specialisation fields in value networks is among the targets of these efforts.

4.5 Israel

The following section presents information on cluster policy in Israel and has a specific focus on the Fuel Choices (and Smart Mobility) CyberSecurity Initiatives.[57]

4.5.1 Development of the national cluster policy

Israel has longstanding innovation policies which have resulted in taking Israel to the top of the innovative country listing and in continuous displays of commitment to fostering domestic high-tech, innovative industries. In addition to a supportive policy environment, Israel provides adequate resources and specific incentives targeting innovation as its main support measures in order to build the required capacities. Israel also seeks to build capacity for innovation through special "innovation visas" for foreign scientists and entrepreneurs as well as tax benefits for companies that develop intangible products and technologies inside Israel.

The Israel Innovation Authority (formerly called the Office of Chief Scientist) is, since 2016, the main body responsible for the country's innovation policy. It is an independent and impartial public entity that operates for the benefit of the Israeli innovation ecosystem and Israeli economy as a whole. Its role is to nurture and develop Israeli innovation resources, while creating and strengthening the infrastructure and framework needed to support the innovation ecosystem. It also advises the government and Parliament ("Knesset") Committees on innovation policy in Israel, and furthermore monitors and analyses the dynamic changes taking place throughout innovation environments in Israel and abroad. The Innovation Authority creates

[57] This section is based on the following sources:
www.pmo.gov.il/English/PrimeMinistersOffice/DivisionsAndAuthorities/OilFree/Pages/OilTech.aspx (Prime Minister's Office Israel);

www.fuelchoicesinitiative.com/ (Fuel Choices Initiative);

www.israeltrade.org.au/wp-content/uploads/2012/03/Oil-Free-Initiative-Description-+-Clusters.pdf (Israel Trade Commission);

http://innovation-israel.mag.calltext.co.il/magazine/45 (Israel innovation Authority);

http://cyberspark.org.il/ (Israeli Cyber Innovation Arena);

https://iea-amf.org/app/webroot/files/file/Country%20Reports/Israel.pdf;http://ec.europa.eu/invest-in-research/pdf/download_en/psi_countryprofile_israel.pdf;https://www.innovationpolicyplatform.org/content/israel; https://siepr.stanford.edu/research/publications/israels-silicon-wadi-forces-behind-cluster-formation; www.forbes.com/sites/davidyin/2017/01/09/what-makes-israels-innovation-ecosystem-so-successful/#523c391070e4;www.cnbc.com/2017/06/26/israels-innovation-rankings-lay-bare-split-between-high-tech-and-the-rest.html;https://en.globes.co.il/en/article-israels-energy-minister-no-coal-gasoline-by-2030-1001214304;
http://www.pmo.gov.il/English/PrimeMinistersOffice/DivisionsAndAuthorities/OilFree (Technology Clusters).

cooperation with counterpart agencies within the Israeli government to promote technological innovation in the Israeli industry and economy.

4.5.2 Cluster programmes - Fuel Choices and CyberSecurity Initiatives

In addition to the country-wide innovation policies implemented by the Israel Innovation Authority, there are two policy programmes directed at clustering and smart specialisation. One is the newly re-invigorated CyberSecurity initiative. The other is the Alternative Fuels Administration's Technological Clusters (see below), also called the Fuel Choices and Smart Mobility Initiative, which is administered through the Prime Minister's Office and which in turn is a result of the government's Israel Oil Free Initiative.

The **CyberSecurity initiative** is comprised of a few dedicated funds to encourage R&D in this field, with a budget of USD 45 million (New Israeli Shekel, NIS 180 million) for 2012-2014. In August 2018 this programme received funding of NIS 90 million for a further 3 years. The CyberSecurity initiative aims to encourage the development of human capital in the cybersecurity field and is engaged in linking relevant military know-how to industry at the Israeli Cyber Innovation Arena.[58] Earlier examples of Israeli clusters were the Silicon Wadi and the Israeli Biotechnology Sector.

The **Fuel Choices Initiative** includes a one-stop shop for firms, a venture capital (VC) backed programme, and assistance in establishing pilot facilities in petroleum substitutes. Its budget is USD 380 million (NIS 1.5 billion) for 10 years (starting 2013). The Fuel Choices Initiative has resulted in four Technological Clusters:

- Biofuels and Energy Agriculture Cluster - Israeli start-ups and technology companies are at the cutting edge of agricultural biotechnology research and development. New types of biofuel and biomass crops, as well as algae technologies, are being developed, as well as better methods for growing, cultivating, and irrigating crops that can be used for energy production. These are at the forefront of the next generation of agriculture. Moreover, innovative processes for converting feedstock and waste into fuels are about to change the economics of biofuels. Because of its small size, the local Israeli market is focusing on promoting second- and third-generation locally produced biofuels, and through that effort, giving its companies and investors a global competitive edge;

[58] The Israeli Cyber Innovation Arena, also called Cyberspark, is a joint venture of the Israeli National Cyber Bureau, the Beer Sheva Municipality, Ben Gurion University of the Negev and a number of leading companies in the cybersecurity industry.

- Electric Vehicle and Energy Storage Cluster - The electric vehicle (EV) and Energy Storage Cluster emerged from decades of academic and applied research in the fields of electrochemistry and electric engineering. In addition to transport applications, the development and production of special energy applications for use in the defence and biomedical sectors are of interest;
- Natural Gas and Synthetic Fuels Emerging Market - One of the government's main objectives is to increase the use of natural gas and natural-gas-based synthetic fuels in the Israeli transportation sector. This goal, backed by government policies and regulations, is expected to generate significant investments in a growing local market;
- Engines, Composite Materials and Other Technologies - thanks to advanced academic and applied research and defence-related developments in diverse technological fields, many Israeli companies and start-ups are providing various solutions to help vehicles reduce oil consumption. Creative companies are developing new engines, efficient power train technologies, and new, composite light materials.

Each technological cluster results from its own particular government intervention, as well as using local market incentives and global partnerships.

Cluster organisations are centralised government organisations, in large part due to the emphasis on government funding and regulatory incentives, as well as on involvement of academic R&D. In the second phase, the involvement of multinational corporations is crucial for the further development of the clusters.

4.5.3 Objectives, measures and focus of the cluster programme

The programme is dedicated to reducing Israel's dependency on oil for transport and supporting alternative fuels in transportation. The Israeli Government’s objective is to turn the country into a centre of knowledge and industry of alternative fuel technologies by supporting the development and implementation of the next generation of alternative technologies. This programme is being implemented with the cooperation of several vehicle manufacturers that support the increased use of alternative fuel technologies in the transportation sector in Israel.

As part of its efforts to reduce dependence on crude oil for transportation for energy security, economic, and environmental reasons, the programme sets ambitious targets for Israel: cut the use of oil for transportation by 30% by 2020 and by 60% by 2025, as compared with currently projected 'business as usual' oil consumption. The targets are based on a bottom-up analysis of the various Israeli transportation market sectors, on the assumption that any solution must be economically viable for the end-user as well as the economy.

The Alternative Fuels Administration has supported several programmes in this context with access to venture capital funding in addition to the government funding provided. They also offer a one-stop shop for interested firms, access to university R&D and expertise, and pilot facilities:

- Venture capital investments - a new governmental co-investment fund is being established in order to promote large investment in venture-backed companies. The government share in each investment will be 33%, up to USD 8 million. Eligible private co-investors include investment funds and corporations, both Israeli and foreign;
- Academic and applied research - Two inter-university research centres with new laboratories and research teams were inaugurated in early 2012. One centre focuses on biofuel research and the other on batteries and fuel cells. The centres were granted NIS 60 million and NIS 45 million, respectively. In addition, a new research fund was established, awarding grants of up to USD 450,000 to research groups in the field;
- Industrial research and development - The Alternative Fuels Administration operates a number of programmes for applied research within companies, research institutes, and universities, including a large research consortium in the field of batteries and fuel cells; and
- Local test-bed - The administration has commenced the operation of a government one-stop-centre that supports companies conducting innovative technological demonstrations, by tailoring Israeli regulations to facilitate each case. In addition, the administration promotes small and medium scale demonstrators under a new technological demonstrations programme, financially supporting demonstrations of up to USD 1 million.

Pursuant to its mission and objectives, the initiative targets the agricultural sector, the oil, gas and alternative fuels sector, and the automotive engineering sector.

4.5.4 Achievements and further development of the national cluster policy

While it is worth highlighting that, in terms of achievements for energy provision, 65% of all electricity is being produced using natural gas (partly from own sources), and the proportion produced with coal fell to 33% in 2018.[59] Transportation related energy use, however, is still heavily dependent on oil. As most of the oil resources need to be imported[60] it is of economic and strategic interest to reduce this dependence. The Fuel

[59]https://en.globes.co.il/en/article-israels-energy-minister-no-coal-gasoline-by-2030-1001214304.

[60] https://www.iea.org/statistics/?country=ISRAEL&year=2016&category=Oil&indicator=CrudeImports&mode=chart&dataTable=OIL

Choices and Smart Mobility Initiative is now actively developing an Electric Vehicles charging infrastructure,[61] while an academic centre will be established, which will serve as a centre for research and development in the field.

Summary box on Israeli cluster policy

In the context of Israel's long-standing innovation policies, innovation capacity building both in companies and on the human resource dimensions has an important role. Of high importance is the support of a favourable innovation ecosystem. Israel's cluster policy focuses strongly on two distinct sectoral and technological fields: Alternative fuels through petroleum substitution, and CyberSecurity. The Fuel Choices Initiative has resulted in four technological clusters, each of them embedded in specific local markets, global networks and benefitting from particular government interventions. This initiative pursues the objective of countering dependence on oil - thus a global challenge - and, more specifically, seeks to boost Israel's position as centre of knowledge, competence and industrial alternative fuel technology businesses. This is in line with earlier examples of Israeli innovation policy which, in part, aim to capitalise on the intellectual property generated.

4.6 China

In the following section, China's cluster policy and in particularly the Torch cluster programme are presented. This section is based on in-depth analyses of the existing literature and publicly available information.[62]

4.6.1 Development of the national cluster policy

China has been amongst the countries worldwide that have most relied on the establishment of clusters to improve the competitiveness of their economy. Promoting the development of clusters started in China in the late 1970s when the government started establishing Special Economic Zones as way to attract foreign direct investment. The government later introduced the concept of 'one village, one product' which led

[61] http://www.fuelchoicesinitiative.com/activities/implementation/

[62] Anna H. Jankowiak Wrocław, 2017. Cluster-Based Development: A Chinese Cluster Policy. DOI: 10.15611/pn.2017.486.06 JEL Classification: F23, F68, L52, O11;

Federico Frattini and Giorgio Prodi, 2013. Industrial clusters in China: Policy tools for further and more balanced development. ERIEP, Number 5, Cluster policy for innovation and competitiveness;

Luc Bruyant, Jiaxin Tang, 2015. Innovation in Business Clusters. Challenging the bottom-up logic through the example of China; European Cluster Collaboration Platform (2015) Discussion paper on China, www.clustercollaboration.eu/sites/default/files/discussion_paper_china_0.pdf;

Mark Preen, 2018. China's City Clusters: The Plan to Transform the Country into 19 Super-regions. www.china-briefing.com/news/chinas-city-clusters-plan-to-transform-into-19-super-regions/;

www.chinatorch.gov.cn/.

to increased specialisation in production, and started building science parks. Cities that were officially recognised as specialised in specific productions were granted funding for the establishment of innovation centres.

Along with the industrial clusters that developed as centrally driven initiatives, industrial clusters also developed spontaneously, especially along the coastal provinces following either a manufacturing specialisation or new business opportunities provided by the economic reforms and market opening. Nevertheless, even for bottom-up clusters, the government played a central role in providing services, such as infrastructure, finance and human capital that strengthened the agglomeration patterns.

What differentiates the spontaneously developed clusters from the government-driven cluster initiatives is that the former operates mostly in low technology and labour-intensive industries, while the clusters established by the government were in high-tech sectors.

Five types of clusters can currently be identified in China. These are: self-growth, export-oriented, high technology, resource-driven and market-driven. These clusters have been the engine of the Chinese export-led economic growth. Most clusters are not represented by a formal cluster organisation, but some belong to sector associations.

4.6.2 China's Torch Program

The Torch Program was established in 1998 and since then has been China's most important programme for high-tech industries. It is a key pillar of the country's national strategy for Science and Technology and pursues a cluster-based development approach. The programme is implemented by the Torch High Technology Industry Development Center of the Ministry of Science and Technology (also called Torch Center) under the guidance of the Ministry of Science and Technology.

4.6.3 Objectives, measures and focus of the cluster programme

The programme's mission is to build China's high-tech industry by promoting innovation and entrepreneurship. Since 2012, the programme has sharpened its focus on strategic emerging industries, promoting the commercialisation, industrialisation and internationalisation of high-tech products made in China. It is also making further efforts towards fostering collaborative innovation by integrating science and technology with the entrepreneurial ecosystem.

The Torch Program is divided into two areas: 1) industry and local development projects, and 2) projects that meet national strategic needs. The first category includes industrialisation projects driven by the establishment of high tech-zones equipped with technology business incubators, university science parks and technology transfer demonstration institutions. It also includes the development of demonstration projects in emerging industries that are based on transferring technology from education and research to industry and the development of strong high-tech brands for the international market.

The second area supports the development of innovative industrial clusters in a number of emerging industries (see below) and technology service systems (i.e. services that support R&D design and technology transfer, entrepreneurship support in technology fields, industry promotion, talent training, technology finance and other service platforms).

The programme is structured in the following four components.

- **Innovation Clusters**. The Torch Program established Innovation Clusters by creating national Science and Technology Industrial Parks (STIPs), Software Parks, and Productivity Promotion Centres. An example of such clusters is Zhongguancun in Beijing, which is considered the Chinese Silicon Valley.
- **Technology Business Incubators** (TBIs).
- **Seed Funding** (Innofund). This was set up in 1999 and is the most important public programme for start-up financing. It provides grants, loan interest subsidies and equity investment to companies with fewer than 500 employees for developing products at the very early stage of development.
- **Venture Guiding Fund**. Established in 2007, it was the first attempt to introduce venture capital schemes in China to support start-ups.

Six strategic emerging industries are targeted by the programme:

- Biotechnology;
- Next generation information industries;
- Intelligent application of spatial information networks;
- Energy storage and distributed energy;
- Advanced materials; and
- New-energy vehicles (NEVs).

4.6.4 Achievements and further development of the national cluster policy

Until 2015, the programme involved 262 national and provincial high-tech zones, built 363 Torch Programm specialised industrial zones, had 88 innovation-based business enhancing centres, and more than 1,300 incubation and university science parks.

Another important benefit of Torch has been the introduction of an entrepreneurial mindset for promoting innovation and the introduction of a start-up culture in the Chinese entrepreneurial ecosystem.

China has unveiled plans for developing 19 super cities to rebalance its economic growth model. This policy aims to further strengthen specialisation and support innovation and competitiveness by bringing together companies, research and development institutions and universities. Three of the 19 super city clusters have been identified to become world-class clusters by 2020. These are:

- the Pearl River Delta in advanced manufacturing, which includes Hong-Kong (financial centre); Shenzhen (ICT, innovation and start-up culture); Guangzhou (manufacturing industry and logistic hub); Macau and Zhuhai (leisure and tourism);
- the Yangtze River Delta centred around Shanghai and on advanced manufacturing; and
- the Beijing-Tianjin-Hebei region, driven by Beijing as the country's' most important R&D centre, the logistics hub in Tianjin; and the heavy industries in the Hebei province.

Summary box on Chinese cluster policy

Clusters not only have a long tradition, but are also of outstanding significance for China's highly export-based economic development and competitiveness. The approach and implementation evolved from attracting foreign direct investment to specialised production, innovation and high-technology support. Clusters have been supported by the Torch Program for the last 20 years as they are considered key for the development of high-tech industries, mainly by promoting innovation and entrepreneurship. More recently, the programme received a stronger focus on emerging industries that are of strategic importance for China's economy. In this overall framework, the programme has two pillars, which address industrial and local development projects, and projects of national strategic importance. The further development of a limited number of super city/region clusters that are crucial for national economic development is been envisaged and 3 super regions have been selected to become world-class clusters. Each has a specific sectoral or technological focus in manufacturing or services. This evolution demonstrates the successive narrowing of the focus, leading to highly specialised clusters in strategic emerging high-technology fields.

4.7 Taiwan

This section presents information on the cluster policy in Taiwan, based on in-depth analyses of the existing literature and publicly available information.[63] It specifically addresses the 5+2 Major Innovative Industries Program.

4.7.1 Development of the national cluster policy

The rapid industrialisation of Taiwan in the absence of a planning strategy has hindered the efficient use of resources. To avoid this drift continuing, the Industrial Development Bureau (IDB) within the Ministry of Economic Affairs (MoEA) formed a team responsible for planning and organising industrial areas. Thus, from 1970 onwards, the development of industrial parks occurred in coordination with economic plans. Clustering then became a natural evolution and is consistently encouraged by the government to maintain competitiveness.

The Taiwanese clusters develop from a science or industrial park established to fulfil the needs of a strategic sector and dynamise the regional economy. They are mainly composed of SMEs with other organisations, such as research centres, universities or incubators, gradually joining.

Cluster policy as such dates back to 1989, when the Small and Medium Enterprise Administration (SMEA), linked to the MoEA as well, began to allocate resources to spur the growth of local industries. In the following years and together with the SMEA, the

[63] This section is based on the following sources: European Cluster Collaboration Platform (2018) Preparatory Briefing Taiwan, www.clustercollaboration.eu/sites/default/files/d3.2_prep_briefing_taiwan_20181030.pdf;

European Cluster Collaboration Platform (2018) Discussion Paper Taiwan, www.clustercollaboration.eu/sites/default/files/d3.5_discussion_paper_taiwan.pdf

https://owc.de/wp-content/uploads/2017/03/Major-Innovative-Industries-New-Innovation-driven-Growth-Momentum-of-Industries-in-Taiwan.pdf (Major Innovative Industries: New Innovation-driven Growth Momentum of Industries in Taiwan);

www.moeaidb.gov.tw/external/images/en/intro2016/2016_Industrial_Development_in_Taiwan.pdf (2016 Industrial Development in Taiwan, R.O.C.);

https://english.ey.gov.tw/News_Hot_Topic.aspx?n=14E46D2B05B8ADF7&sms=A0BEB910B512D0C8; https://english.ey.gov.tw/News_Hot_Topic.aspx?n=53CC7B9EC4AE934F&sms=CEDBC95579E256CB (Executive Yuan, executive branch of the ROC government);

www.ndc.gov.tw/en/Content_List.aspx?n=2F60AA0DDF24F2D4&upn=13AC2529652D1127 (The 2018 National Development Plan, National Development Council);

www.moeasmea.gov.tw/lp.asp?ctNode=307&CtUnit=36&BaseDSD=7&mp=2 (2017 White Paper on Small and Medium Enterprises in Taiwan).

Corporate Synergy Development Center (CDS) was the principal support to Taiwanese clusters, contributing to their development and improving the image of local products.

In 2008, the SMEA presented the strategic Plan for the Provision of Integrated Services to Support SME Industry Cluster Innovation, which aimed to stimulate clusters in core sectors, to promote innovation and integration in industrial clusters, and to build an industry-service network. Aware of their value, the Administration anticipated that the adoption of cutting-edge business models would help the growth of industry clusters, while the combination of horizontal and vertical integration would facilitate differentiation.

In 2009, the Executive Yuan established the Local Industry Development Fund to promote economic prosperity by providing financial assistance to local industries. It also approved the 'i-Taiwan 12 Projects Plan' (2009-2016), which carried out 12 key infrastructure projects, including the development of new high-tech industrial clusters in central Taiwan.

Subsequently, the government prioritised cluster creation in its 5+2 Major Innovative Industries Programme (2016, see below), a core element of the New Economic Development Model (2017-2020). Finally, the 2017 White Paper on Small and Medium Enterprises stated the importance of promoting the development of local industrial clusters and SME clustering in order to strengthen national competitiveness.

4.7.2 The 5+2 Major Innovative Industries Policy

Following the top-down approach of the government in cluster development, the 5+2 Major Innovative Industries Programme (2016) is the current reference framework for Taiwanese clusters.

The initiative encourages cluster creation in the biotech and pharmaceutical, green energy, national defence, smart machinery and IoT sectors, as well as a new paradigm for agricultural development and the circular economy. Domestic demand, software and hardware integration and R&D capabilities converge in these sectors, contributing to seize the trends of the next generation industries: local communities build on the advantages of industrial clusters and establishing connections among them, and increasing interaction of talent, capital and market between countries occurs on the international scale.

4.7.3 Objectives, measures and focus of the cluster programme

The objective of the programme is to foster the emergence of comprehensive industry clusters in the selected sectors and in different regions, according to their sources of

comparative advantage, so as to achieve an appropriate balance between industrial cluster development and the needs of regional development, supporting Taiwan in completing its transition into an innovative and sustainable economy and bringing prosperity for society.

Among the specific objectives are the generation of employment, the fair distribution of economic rent across regions, the increase of R&D capabilities and consequent upgrade and optimisation of industrial clusters' potential, the attraction of world-class companies and talent, the creation of a highly skilled workforce pool, as well as an attractive business environment, and the commitment to a sustainable development.

The 5+2 Major Innovative Industries offers the following support measures:

- Launch more start-up supportive policies on talent, capital, regulations and global networking to optimise the cluster ecosystem;
- Develop and implement specific programmes for each of the target sectors considered in the programme;
- Stimulate investment, especially from the private sector, so that government can support the development of objectives and exit when these are reached;
- Strengthen intellectual property protection and harmonise regulations with international standards;
- Create job opportunities and foster talent to address the shortage of manpower and brain drain;
- Enhance the effectiveness of technology transfer; and
- Foster international cooperation.

The initiative covers the biotech and pharmaceutical, green energy, national defence, smart machinery and IoT sectors, agricultural development and the circular economy.

4.7.4 Achievements and further development of the national cluster policy

Taiwan's cluster policy has generated the following outcomes:

- Establishment of the Hsinchu Biomedical Science Park industrial cluster;
- Acceleration of the development plan of Taichung Science Park and assistance to semiconductor companies in the mass production of advanced chips that use 7-nanometer process technology;
- Attraction of significant investments and implementation of industrial upgrading programmes in the Southern Taiwan Science Park;
- Contact Taiwan, a platform for recruiting overseas talent, is working to attract to Taiwan international professionals with specialist expertise;
- Promotion by the MOEA of the Industry Professional Assessment System (iPAS) to help meeting industry's needs;

- In 2017, machinery exports grew 21.4% from January to September compared with the same period in the previous year; and
- Signature of several contracts with foreign and domestic firms for wind farms and solar projects.

Focused on achieving an innovation-driven economic growth, Taiwan positions clusters as a central instrument of current and future policy frameworks, especially at regional level, for the implementation of long-term development strategies that facilitate learning-based processes of innovation, change, and improvement. For instance, one of the main elements of the 2018 National Development Plan is accelerating the implementation of the 5+2 Major Innovative Industries Programme.

Moreover, to optimise their instrumental capability, Taiwan has launched several calls for investments in research and development (R&D) facilities located within strategic clusters. By placing these facilities and universities near science and industrial parks, Taiwan expects to enhance research, development and innovation (RDI) capabilities, build upstream-downstream value chain collaboration mechanisms, and ultimately strengthen the cluster ecosystem.

Summary box on Taiwanese cluster policy

Cluster policy in Taiwan has a tradition going back some 30 years. Initially, it targeted support for local industries and local products, and later introduced a sectoral approach in order to establish networks between industrial and service sectors. Launched in 2016, Taiwan's 5+2 Major Innovative Industries Programme targets local industries and SMEs as vehicles to boost economic competitiveness. It focuses on five technology fields plus agricultural development and the circular economy, emphasisng their embeddedness in local communities and their integration in international trade relations. This is addressed by exploiting comparative advantage and thus promoting industrial and regional development. A broad range of support is provided to this end, complemented through research and development facilities at strategic locations. This is intended to support the cluster ecosystem and ultimately to contribute to Taiwan's mission of establishing an innovative and sustainable economy.

4.8 Singapore

This section delivers insight into cluster support in Singapore on the basis of an in-depth analysis of the literature and available information.[64] It focuses on Singapore's

[64] This section is based on the following sources: Evers H., Gerke S., Menkhoff T., (2015). Growth through Knowledge Clusters: Singapore as a Knowledge Hub, www.researchgate.net/publication/292193520_Growth_through_Knowledge_Clusters_Singapore_as_a_Knowledge_Hub;

Innovation & Enterprise (I&E) Cluster Fund: www.nrf.gov.sg/innovation-enterprise/innovation-enterprise-cluster-fund;

cluster support which is embedded in the Research, Innovation and Enterprise Plan of the city-state.

4.8.1 Development of the national cluster policy

Singapore was one of the first Asian countries to introduce the cluster approach to fostering industrial development and is considered one of the most impressive success stories of economic growth in the 20th century. The transition from a resource-efficient economy to an economy based on innovation and differentiation started in the beginning of the 1990s, when the government launched its first Strategic Economic Plan and set out to create competitive and industry-leading clusters. Chemicals, biomedical science and engineering were initially identified as clusters with the highest growth potential. In 1999, biotechnology was also added as a priority. Since then, Singapore has pushed forward with massive efforts to promote the creation of a flourishing business environment, and an open, knowledge and innovation-driven economy. To this end, Singapore has strengthened its national R&D capabilities by fostering industry-science linkages in a coherent and consistent way, including by linking education and entrepreneurship policies to industrial development.

Since its independence in 1963, Singapore has followed a policy of designating specific areas to host knowledge clusters and identifying special areas of research and development to set up knowledge hubs. Knowledge clusters are made of universities, colleges, research institutions, think-tanks, government research agencies and knowledge-intensive firms, and are designed to be production-oriented (i.e. drive innovation and create new industries). By successfully managing and applying knowledge governance, Singapore has been able to create sustainable knowledge clusters with dynamic knowledge hubs.

Each Innovation and Enterprise (I&E) cluster is jointly led by an economic agency, which is in charge of identifying and pursuing market opportunities for growing the cluster,

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Montesclaros J.,Teng P., (2018). Ensuring a Successful Singapore Urban Food Cluster. NTS Insight, no. IN18-02, February 2018, https://think-asia.org/bitstream/handle/11540/8401/NTS-Insight-_-Ensuring-A-Successful-Singapore-Urban-Food-Cluster-_-February-2018-__.pdf?sequence=1;

RIE2020 Plan, https://www.nrf.gov.sg/docs/default-source/default-document-library/rie2020-publication-(final-web).pdf;

OECD, 2013. *Innovation in Southeast Asia*. https://doi.org/10.1787/9789264128712-en;

www.thecasecentre.org/programmeAdmin/products/view?id=105830;

The Straits Time, (2018). Singapore's 23 key industries to be grouped into 6 clusters as economy begins next phase of transformation: Heng Swee Keat, https://www.straitstimes.com/business/economy/singapores-23-key-industries-to-be-grouped-into-6-clusters-as-economy-begins-next.

and a technology agency, which strengthens the translational competencies and activities of organisations and entities identified under the cluster.

4.8.2 Singapore's cluster programme

The Research Innovation Enterprise (RIE) 2020 Plan is Singapore's five-year research and innovation programme. RIE2020 has an overall budget of approximately EUR 16.75 billion (it was around EUR 14.11 billion in the previous programming period). It is structured in four pillars pursuing specific objectives:

- Closer integration of research thrusts. Invest in mission-oriented research by fostering stronger multi-disciplinary and multi-stakeholder collaborations;
- Stronger dynamics towards the best teams and ideas. Shift towards more competitive funding (up to 40% from 20% in the previous programming period), while increasing the so-called "White Space" funding to allow greater flexibility in re-prioritising funding towards areas where new opportunities might emerge;
- Sharper focus on value creation. Increase the impact of collaborative approaches for the economy and society; and
- Optimised RIE manpower. Sustain the development of a qualified workforce and attract talents from abroad.

The RIE ecosystem is complex and includes various ministries, R&D funding bodies and R&D performers (large enterprises, SMEs, research institutes, universities, hospitals, laboratories). At the top, the Research, Innovation and Enterprise Council, chaired by the Prime Minister, oversees Singapore's long-term development and is supported by the National Research Foundation Board, which formulates Singapore's 5-year plans and innovation policies.

The Research, Innovation and Enterprise 2020 plan (RIE2020) includes the Innovation & Enterprise (I&E) Cluster Fund which represents the continuation of the Innovation Clusters programme under RIE2015.

4.8.3 Objectives, measures and focus of the cluster programme

The Innovation & Enterprise (I&E) Fund was set up to facilitate the translation of research into impactful socio-economic outcomes. Its primary objective is to build a strong core of innovative enterprises by building upon the national start-up ecosystems. To this end, the I&E Fund has four key priorities:

- provide targeted support to help firms scale up;
- foster stronger collaboration and cohesion;
- encourage greater industry participation; and
- support domain-specific strategies.

Cluster development plans encompass support for shared infrastructure, capacity building and bridging gaps in the value chain. Through the I&E fund, the national institutions have created tailored initiatives to further support the formation of new businesses, to promote the internationalisation of cluster organisations, and the creation of solid partnerships and collaborations among universities, companies and institutional bodies.

The government envisages undertaking the following initiatives:

- providing equity co-investment funds for start-ups from early-stage seed funding to post-Series A[65], to help start-ups to grow;
- partnering multinational companies and local corporates to co-invest in promising start-ups, incubators and accelerators to allow start-ups to access the management expertise and global networks of large firms;
- expanding the role of technology transfer offices in public research organisations to include technology transfer, I&E education and incubation services in order to establish integrated Innovation & Enterprise Offices;
- establishing a central fund that supports national collaborative initiatives amongst Innovation & Enterprise Offices;
- developing ad hoc funds to address domain-specific needs.

The main focal sectors for the current cluster policy are:

- Advanced Manufacturing and Engineering (aerospace, electronics, chemicals, machinery & systems, marine & offshore, precision modules & components, biologics & pharmaceutical manufacturing, medical technology manufacturing);
- Health and Biomedical Sciences;
- Urban Solutions and Sustainability; and
- Services and Digital Economy (urban mobility, healthcare ICT, services productivity).

4.8.4 Achievements and further development of the national cluster policy

Singapore's economic success is due to its capacity to develop strong and sustainable knowledge clusters and hubs from scratch. Successful examples of Singapore's knowledge-intensive industries include electronics and ICT, chemicals, pharmaceuticals, petroleum refining, ship repair, offshore platform construction, financial services, life sciences and biotechnology.

[65] A specific phase of start-up fund rounding that support the growth of an established company. Series A rounds raise approximately between US $ 2 million to US $ 15 million.

Examples of successful outcomes of Singapore's cluster policy are public-private research partnerships such as the Keppel-NUS Corporate Laboratory and the Institute of Microelectronics' Advanced Semiconductor Joint Labs. Other internationally competitive research consortia are in the aerospace industry, photonics and life science industries. Singapore is also emerging as a strong global competence hub for water resource management.

The success of clusters in Singapore can also be measured by their capacity to attract international investors. Two recent examples are:

- The Diagnostics Development Hub established in 2014 has attracted multinational companies such as Johnson & Johnson Innovation; and
- The National Additive Manufacturing Innovation Cluster, launched in 2017, collaborates with international companies such as SigmaLabs, 3D Systems, Autodesk and Hitachi-Sunway.

In 2018, Singapore unveiled its plans for future cluster development. These are based on aggregating the 23 national industries, for which industry-specific road maps have been defined since 2016, in six clusters to maximise opportunities for collaboration and better respond to the needs of SMEs and industry. The new clusters are:

- Manufacturing;
- Built environment;
- Trade and connectivity;
- Essential domestic services;
- Modern Services; and
- Lifestyle.

Summary box on cluster policy in Singapore

Singapore was among the early adopters of the cluster approach in its economic policy. Favouring industrial development, the policy was set up with a clear technological focus on fields with high growth potentials. National efforts target favourable business ecosystems by strengthening R&D capabilities, industry-science linkages, education and entrepreneurial policies. Currently, cluster support focuses strongly on the start-up ecosystem, in order to build a core of strong innovative enterprises. Various initiatives are promoting this goal, including institutional support, business funding, knowledge and technology transfer, education, etc. A very strong focus and success factor are knowledge clusters and hubs in a range of technologies. Very recently, existing industries have been aggregated into six clusters that enable cross-sectoral collaboration and form the base for industrial needs. Focused investment contributes to economic development, e.g. by attracting foreign investment.

4.9 Japan

This section presents information on the cluster policy in Japan. It particularly addresses the Industrial Cluster Policy and Japan's Knowledge Clusters. It is based on available documents and information.[66]

4.9.1 Development of the national cluster policy

Japan ranks among the most developed economies in the world and invests 3.58% of its GDP in R&D activities (World Bank data). Since the 1980s, Japan has pursued the goal of becoming an innovation, science and technology driven economy and society. After the economic and financial crisis that hit Asia in the 1990s, and to counterbalance the relocation of production to China and other Asian emerging countries, the Japanese government decided to strengthen the competitiveness of the national economy by investing more in R&D and following a cluster approach for reinforcing regional ecosystems. The cluster approach resulted from a joint initiative of the Ministry of Economy, Trade and Industry (METI) and the Ministry of Education, Culture and Sport (MEXT).

[66] This section is based on the following sources: European Cluster Collaboration Platform, 2015. Preparatory Briefing on Japan. www.clustercollaboration.eu/international-cooperation/japan;

EU-Japan Centre of Industrial Cooperation, in www.eu-japan.eu/high-tech-cluster-support;

Ganne B., Lecler Y., 2009. Asian Industrial Clusters, Global Competitiveness and New Policy Initiatives, World Scientific Publishing Co. Pte. Ldt.;

Hosoya Y., 2011. Japanese public initiatives for SMEs and cluster cooperation, Workshop EU-Japan Clusters Policies toward SMEs' Innovation. www.eu-japan.eu/sites/eu-japan.eu/files/presentation_hosoya.pdf;

JETRO Japan, in https://www.jetro.go.jp/;

METI, 2009. Industrial Cluster Project. www.meti.go.jp/english/policy/sme_chiiki/industrial_cluster_en.html;

MEXT, Reform of Japan's Science and Technology System. www.mext.go.jp/en/publication/whitepaper/title03/detail03/sdetail03/sdetail03/1372926.htm;

Organisation for Small and Medium Entreprise and Regional Innovation, www.smrj.go.jp/english/about/;

Second Term Medium-range Industrial Cluster Plan, 2006. Regional Economic and Industrial Policy Group Ministry of Economy, Trade and Industry. www.meti.go.jp/policy/local_economy/tiikiinnovation/source/2ndplan_outline_eng.pdf;

World Bank, 2015. Research and development expenditure (% of GDP), Japan 2015. https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS;

Yamamoto K., 2006. The Industrial Cluster Plan of the Japanese government and the realities of regional economies in Japan. https://link.springer.com/article/10.1007%2FBF03183104.

The industrial cluster approach was triggered by the 1995 Science and Technology Law, which encouraged cooperation among universities and firms. In 2001, the second Science and Technology Law paved the way for major reforms, especially in the ICT, environment, life science and nanotechnology industries, and brought about the launch of the Industrial Cluster Project by METI.

In 2002, MEXT launched the Knowledge Cluster Initiative. This strategy was based on the need to achieve the highest possible complementarities between education, universities, industry and public agencies. While the Industrial Cluster Project focused on the modernisation of existing industries by building networks and partnerships along the quadruple helix model, the Knowledge Cluster Initiative targeted new technologies and emerging industries.

4.9.2 Japan's cluster support

The cluster approach marked a shift from an industrial policy based on the connections between the central government and large firms to a regionally based policy designed to support SMEs and start-ups.

The **Industrial Cluster Project**, also known as Project for Regional Regeneration and Industrial Clustering, has been structured in three phases:

- Phase 1 (2001-2005) - Industrial Cluster Start Up - represented the foundation of the industrial clusters and the launch of 19 industrial cluster projects;
- Phase 2 (2006-2010) - Industrial Cluster Development - aimed at consolidating the regional industrial policy and to further promote the creation of new cluster organisations. During the second phase, 17 clusters were targeted; and
- Phase 3 (2010-2016) - Industrial Cluster Autonomous Growth, the government encouraged industrial agglomerations to reach financial independence and autonomous growth.

The **Knowledge Cluster** is a peculiarly Japanese creation. It consisted of establishing local technological innovation systems organised around universities and other public research institutions which support R&D activities and investments. They were considered as complementary to the industrial clusters, and in particular they were used to respond to the needs emerging from the industrial clusters. In 2002, MEXT launched 12 Knowledge Clusters. By the end of the first programme phase only 11 could be labelled 'knowledge clusters'. This was further reduced to 9 in the second project phase when the focus was on upgrading existing clusters to world-class clusters. The programme ended in 2011.

The two cluster initiatives were coordinated by the central government, while implementation has been a shared responsibility of national and regional organisations. For instance, METI local offices were in charge of monitoring the development and progress of industrial clusters. Internationalisation activities were assigned to the Japan External Trade Organisation (JETRO).

In 2001, the government established the "Council for Science and Technology Policy" (CSTP), an institutional body within the Cabinet Office which played a role of regulator and coordinator among the knowledge and industrial clusters.

Most cluster organisations were initiated and funded by either METI or MEXT and a quality label was introduced in 2001. However, the Japanese definition of cluster organisations does not fit well with European cluster concepts and examples. Most cluster organisations in Japan are designed to be temporary R&D structures coordinating private companies, universities and public entities in the realisation of very specific research projects. Once the project's objectives are achieved, the cluster ends its activities. In some regions, clusters are not supported by cluster organisations but by regional industrial promotion agencies, which can establish a dedicated cluster department.

4.9.3 Objectives, measures and focus of the cluster programme

Japan's cluster policy has been designed to enhance the country's competitiveness, to reduce territorial imbalances, and to strengthen collaborations and partnerships among universities, companies, research centres and government agencies.

The METI and MEXT aimed to develop cluster organisations which meet the following criteria:

- be a springboard of innovation;
- optimise productivity within industries and strengthen their resilience; and
- accelerate the formation of international clusters.

Thanks to the Industrial Cluster Policy and the Knowledge Clusters, MEXT and METI have worked to open new fields for businesses, to create start-ups and new products by promoting collaboration projects among industry, academia and government.

The industrial cluster programme supported the establishment of networks in regions for collaboration among enterprises, universities and government agencies, and developed a business environment for creating new industries and new businesses. The central government and the local offices have supported partnerships between local business and universities, and linkages with SMEs, and have promoted universities' spin-offs. Commercialisation of innovation and international visibility of clusters have

also been important focus of the programme. The following types of initiatives have been supported:

- business match-making across the same and different industries;
- collaborative research and establishment of research consortia; and
- promotion of cluster alliances nationally and internationally.

The main sector domains of cluster projects are:

- automobile and transport equipment;
- ICT;
- aircraft;
- food manufacturing;
- electronics;
- life sciences;
- nanotechnology;
- environment and energy; and
- tourism.

4.9.4 Achievements and further development of the national cluster policy

An interim assessment performed by METI in 2009 showed that the industrial cluster projects were able to increase the number of new businesses and to strengthen the competitiveness of existing businesses.

In 2016, JETRO mapped 52 cluster organisations in the whole country.[67] A Japanese cluster mapping performed by the EU-Japan Centre in 2016 showed that most cluster initiatives have ended. The government support is decreasing, but some cluster initiatives continue to develop and new initiatives are being established all over the country. While METI is still providing some targeted and ad-hoc support, at present there is no nationally active cluster programmes.

However, a number of governmental programmes are providing support to specific industries and ecosystems, and are also relevant for clusters. These are:

- The Regional Innovation Ecosystem Creation Programme (a follow up to the Knowledge Cluster Building programme, but with a higher focus on commercialisation of new technologies);

[67] A detailed list of clusters by the above sector classification is available at JETRO web site (https://www.jetro.go.jp/en/invest/region/icinfo.html).

- The Regional Core Business creation support programme (supporting specific industries to match with local networks, market research and human resources development);
- Centre of Innovation (COI) programme (innovation and entrepreneurship); and
- Regional Industry Tie-up programme (internationalisation of Japanese regions).

Summary box on Japanese cluster policy

Japan implemented the cluster approach to strengthening regional ecosystems as a means to increase national competitiveness. Cluster policy was introduced in the 1980s through a joint approach of the ministries in charge of economic development and of education. In subsequent years, regulatory reforms have further underpinned industrial cluster development. At the beginning of the 2000s, knowledge clusters complemented the approach of industrial clusters, with both pursuing specific targets and addressing specific actors. The main objectives of Japan's cluster policy are to strengthen the country's competitiveness, as well as to support cooperation and collaboration between public and private actors and to mobilise local economies. These approaches resulted in new business fields, new products and new companies in various sectors and technology fields. Currently, the cluster programmes have expired, which is in line with the general philosophy of the temporary character of cluster organisations. Nevertheless, clusters initiatives are developing throughout the country, and clusters are eligible for public support in various public programmes.

4.10 South Korea

This section addresses cluster policy in South Korea, specifically the Industrial Complex Cluster Programme, based on various sources of available information and the literature.[68]

[68] This section is based on the following sources: "The MOU between KICOX and Torch Center (China) was signed", www.cluster.or.kr/en/index.jsp;

European Cluster Collaboration Platform, 2015. Discussion paper: facilitating policy dialogue on cluster cooperation with South Korea, www.clustercollaboration.eu/sites/default/files/discussion_paper_korea.pdf;

European Cluster Collaboration Platform, 2015. Preparatory Briefing on The Republic of Korea, www.clustercollaboration.eu/sites/default/files/eccp_preparatory_briefing_southkorea_20181024_v2.1.pdf;

Kee-Bom-Naham, 2015. Evaluating Korean Innovative Cluster Policies: Emerging a New Type of Asian Clusters? www.slideshare.net/TCINetwork/tci-2015-evaluating-korean-innovative-cluster-policies-emerging-a-new-type-of-asian-clusters;

KICOX, Korean Industrial Complex Corporation, www.cluster.or.kr/new_app/main/login/index.jsp;

KICOX, Ministry of Knowledge Economy, 2010. The Industrial Complex Cluster Program of Korea, www.clustercollaboration.eu/sites/default/files/international_cooperation/the_industrial_complex_cluster_program_of_korea_2010.compressed.pdf;

4.10.1 Development of the national cluster policy

At the beginning of the 2000s, Korea prioritised Science and Technology (S&T) and moved from the position of second-tier innovator to technology leader in future industries. Industrial agglomerations massively contributed to enhancing the economic growth of South Korea between 1960 and 1990. Since the mid-1990s, a constrained labour market and competition from other Asian countries with lower labour costs has pushed the Korean government towards a different industrial approach, which focused on innovation clusters.

In this new vision, economic growth was to be based on creating technological innovation backed by R&D activities. The existing techno parks and industrial complexes were transformed into innovation clusters, whereas new science and technology complexes were established at the government's initiative. Cluster policies were also adopted to achieve a more balanced territorial development.

A specific feature of Korea's S&T development has been the fact that the cluster approach was heavily government-driven at the beginning of the process, whereas it later became industry-driven with a more prominent role assigned to regional government bodies. As compared to past industrial policies, cluster policies have relied on a combination of top-down and bottom-up approach, which was fostered by strengthening regional autonomy.

The governance system of clusters in South Korean is rather different from Europe. South Korea has many industrial complexes, which correspond to industrial agglomerations and large science/technology parks. Within these complexes, which provide the physical infrastructure, a number of mini-clusters (networks) have been established to bind together SMEs, universities, research centres, supporting agencies and local government bodies in a specific sector.

Kim J., 2015. Lessons for South Asia from the Industrial Cluster Development Experience of the Republic of Korea, Asian Development Bank, South Asia working paper series, n. 37;

Park SC. Koo Y, 2013. Innovation-driven cluster development strategies in Korea. The European Review of Industrial Economics and Policy; Park, SC, 2009. "Seoul digital complex as a strategy for building innovative cluster", AI & Society, 24: 393. https://doi.org/10.1007/s00146-009-0225-2;

Park S. O., 2007. Regional Innovation and Cluster Policies in Korea. Korea-France Workshop on Science & Technology Policies, Seoul National University. http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN029037.pdf;

Yim D. S., 2017. Development and Management of Innovation Clusters in Korea and Policy Implication, 3rd International Conference on Science, Technology, Innovation (STI) and Development (STEPI-World Bank), Seoul, www.unescap.org/sites/default/files/3.3-RoK.pdf.

4.10.2 The Industrial Complex Cluster Programme

The Industrial Complex Cluster Programme (ICCP) was devised in 2005 to foster competitiveness and to transform the existing industrial complexes into innovation clusters. The ICCP is supervised by the Ministry of Trade, Industry and Energy (MOTIE), which defines the strategic direction of the programme and undertakes the necessary regulatory actions. At the operational level, the development of clusters has been centrally supervised and operated by KICOX – the Korea Industrial Complex Corporation.

The Industrial Complex Cluster Programme was implemented in three steps.

- The first period, 'early stage cluster development' (2005-2009), was devoted to promoting Korean-style clusters. The government nominated seven national industrial complexes and one national science and technology special zone as model innovative clusters (Gumi agglomeration, Banwol Sihwa, Gwangju, Wonjiu, Ulsan, Changwon Gunsan and Daedok Innopolis). Each of these model clusters had two goals: the development of their strategic industrial areas, in order to strengthen their competitiveness and generate regional economic growth; and the creation of their own local innovation system for cooperating with academia;
- The second period, the 'growth stage' (2009-2012), consolidated the achievements of the first phase and extended the model tested in phase I to all clusters; and
- The third period, the "mature stage" (2013-2016), aimed to consolidate the results of the other two phases. The purpose of this phase was to build self-sustainable clusters based on the established network of industry, academic, research, and government bodies. The government was committed to creating and executing R&D programmes to bolster the innovative capabilities of SMEs, as well as networking activities to promote exchange and cooperation among industry, academic, research, and government fields. In this phase, cluster internationalisation was also an important objective.

A pivotal feature of the ICCP relies on the fact that the government launched the project of targeting existing industrial complexes where companies have already agglomerated, rather than creating new ones.

4.10.3 Objectives, measures and focus of the cluster programme

The main objectives of the ICCP include:

- supporting innovation in all forms;
- creating large-scale industries in all regions gathering specific industries in industrial complexes;
- upgrading R&D districts and production complexes and equipping them with R&D and production capabilities; and
- reinforcing SME representativeness in the national economy and the establishment of local ecosystems made up of universities, firms, R&D centres and public agencies and bodies.

Clusters were developed by both central and regional authorities through a gradual process that started with the establishment of production clusters that were subsequently upgraded to R&D clusters and finally evolved into innovation clusters. The ICCP mainly involved building an innovation system through networking among regional actors, such as companies, universities, research institutions, and local governments. Activities, such as technical seminars and support for project discovery, were supported. The programme also provided intensive support to field projects in various areas, including general management, R&D, skills and marketing. Overall the approach pursued has been strongly R&D-based, which could be described as problem-based co-operation of SMEs with R&D institutions initiated within the mini-clusters and driven by public funding.

Since 2010, interregional cooperation and the establishment of global networks has also been pursued as an important objective. An example of these efforts is the agreement with China's Torch centre. The agreement sets a framework for collecting and exchanging information to strengthen cooperation between South Korea and Chinese clusters, to organise activities jointly (e.g. investigation missions, technical seminars, match-making events) and to reinforce industrial cooperation between the two countries more generally.

The South Korean strategic technologies for 2013-2017 include:

- ICT convergence with new industry (next generation 5G, advanced materials, environment-friendly vehicles);
- health and longevity (personalised drug treatment, biochips for disease diagnostics, stem cells technologies, robot technologies for healthcare services);
- clean and comfortable environment (high-energy efficiency building);
- future growth engines (solar energy, space launch vehicles); and
- secure society (social disaster protection, food safety).

4.10.4 Achievements and further development of the national cluster policy

Between 2005 and 2011, the ICCP supported 77 cluster organisations (mini clusters) formed around seven regional specialised industries. Presently, South Korea has 45 industrial complexes nationwide and 78 mini clusters (European Cluster Collaboration Platform, 2018). More importantly, it has managed to achieve the objective of establishing regional innovation ecosystems where different actors work together.

In 2017, the extension of the ICCP was approved by the government. The current ICCP will continue until 2020. At the same time, KICOX is also planning for the next phase of the Cluster Policy for Korea, and the new initiative should begin in 2021.

In parallel with the ICCP, the Korean government is developing a new policy called National Innovation Cluster to consolidate and extend the achievements of the ICCP in a more balanced way throughout the country. This process is overseen by the Korean Institute for the Advancement of Technology (KIAT) and MOTIE. Within this new policy, two types of clusters are planned:

- the R&D type, which targets large-scale demonstration projects for promoting new industries; and
- the non-R&D type which aims to establish innovation systems at local level.

Summary box on cluster policy in South Korea

Industrial agglomerations and - since the mid-1990s - innovation clusters play a prominent role in South Korea's economic and territorial development. Over time, cluster support has shifted from a top-down and government-driven to a top-down and bottom-up approach that has strengthened South Korea's regions and regional governments. Generally, - deviating from the European approach - sector-specific networks and clusters are part of industrial agglomerations and large technology or science parks, which provide the physical infrastructure. This approach is embedded in the Industrial Complex Cluster Programme that aimed at supporting self-sustaining clusters in three funding periods on the base of already existing industrial complexes. Its main objectives were related to research and development, and innovation and SME involvement in ecosystems made up by different public and private actors. The general philosophy is to gradually develop innovation clusters by upgrading production into R&D and innovation clusters. Since 2010, the additional objective of interregional cooperation and integration in global networks has been added. The Industrial Complex Cluster Programme has succeeded in establishing regional ecosystems with collaborating actors and will continue beyond 2020.

4.11 Main findings of the international examples

The analysis has shown that all ten non-European countries selected deliver cluster support in their countries, mostly as part of dedicated cluster programmes, but also through other programmes which also cover support for cluster activities. The ten countries support cluster activities with broad objectives such as competitiveness, innovation, entrepreneurship, and/or with specific sectoral or technological goals, as, for instance, the case of Israel shows.

In some countries (e.g. Brazil, China, Japan, South Korea, Taiwan), the local or regional dimension receives high attention, mostly in order to support a more balanced economic development in the countries' territories, ultimately leading to increased competitiveness on the national level. Compared to the understanding of the cluster concept in Europe, the Asian examples are slightly different. Here, clusters are often based on pre-existing territorial industrial complexes and/or industry, science or technology parks.

Overall, cluster initiatives are being pursued with various objectives, which shows their high importance in terms of achieving political goals and their pertinence as a vehicle for economic development and growth. However, there are also two examples (Japan and South Korea), where cluster development was initially supported by the national government, which then later shifted away from directly supporting cluster activities, for instance through launching specific programmes for cluster support.

The non-European examples also emphasise that cluster support is embedded in the specific national framework conditions and government policy. Generally, cluster support is not a recent approach and shows certain development trends such as from promoting industrial to innovation clusters, or - as the Canadian example shows - from clusters to superclusters. Relying on and further developing existing capacities and resources thus seems to be a coherent approach that is pursued in different parts of the world.

Most countries target their national territories, but internationalisation and cluster collaboration beyond national borders is important in the case of China, Mexico or South Korea. Differences in clustering activities related to country size can be observed: China's super regions for instance cover several large metropolises. Consistent with the cluster concept, small and medium-sized enterprises and favourable local or regional eco-systems are at the core of cluster policies in the countries analysed. In some cases, for instance in China, they have the role of vehicles for high-technology development. More recently, a new focus on emerging industries and/or start-ups has complemented the objectives and targets of cluster support in some countries, for instance in China or Singapore.

A broad range of achievements are resulting from cluster policies in the countries considered. Among these are establishing and further developing networks, cluster and collaboration structures, bringing together different types of public and private actors and strengthening cooperation between public and private stakeholders, establishing research actors, research partnerships, as well as new actors - mostly businesses, but also intermediaries that improve coordination of governance levels as the Brazilian case shows.

Establishing efficient eco-systems - often with a particular focus on innovation - specialisation, innovation and economic development are further achievements in addition to advancing specific sectors, technologies - specifically high technology fields - but also emerging fields. Depending on the national economic priorities, clusters also contribute to achieving economic goals beyond national borders, such as export promotion, international business cooperation, attracting investments and talents.

Cluster policy approaches also contribute to the development of strategies and roadmaps, as well as to promoting analytical competence and the exploitation of exercises like monitoring or mapping for further economic development. Interestingly, some countries (e.g. Japan, South Korea) simultaneously support different types of clusters with specific goals, e.g. industrial and knowledge-related clusters in Japan or R&D and non-R&D clusters in South Korea. This approach helps to develop specific types of clusters, their particular characteristics and needs.

Annex A - Methodological approach

The information presented in this report was obtained by applying a mix of different methods. Chapters 2 and 3 are based on two online surveys on cluster policies and programmes in EU Member States and in third countries participating in Europe's programme for small and medium-sized enterprises (COSME), as well as in various European regions. The questionnaire for the **national survey** 2018 was developed on the basis of the report of the European Cluster Observatory[69] in order to enable a comparative view, but enriched through additional topics referring to entrepreneurship and industrial change. The 2018 survey covered the following topics:

- General information on cluster programmes;
- Description of the cluster programmes;
- Funding aspects;
- Implementation of the cluster programmes;
- Support for further cluster development; and
- Some general final questions and assessments.

In order to facilitate replying to the survey, the questionnaire provided a set of answer categories that could be ticked or assessed. In addition, the questionnaire offered the opportunity to add individual further aspects in text form. Definitions for key aspects contributed to a common understanding of concepts like "emerging technology", "emerging industry", "social economy", "scale-up", etc. Different filtering options guided the respondents through the questionnaire and enabled to meet the country-specific conditions. So some parts of the questionnaire - general information on cluster support and its further development as well as helpful initiatives to support cluster development - addressed all participants to the survey, while specific questions on cluster programmes targeted countries and regions that operate specific programmes for cluster support.

Technically, the survey was implemented using the Enterprise Feedback Suite (EFS) Survey by Questback GmbH. The questionnaire was forwarded to the contact persons together with an invitation letter that briefly explained the background and invited the addressees to participate in the survey. Contact details of the survey teams were provided, and the addressees were invited to contact the team of the European

[69] European Commission (ed.) (2015): Cluster Programmes in Europe. Report, European Cluster Observatory. Prepared by Dr. Gerd Meier zu Köcker, Lysann Müller, VDI/VDE-IT, https://ec.europa.eu/docsroom/documents/12925/attachments/1/translations/en/renditions/pdf.

Observatory for Clusters and Industrial Change (EOCIC) for questions or further information. The initial invitation was followed by two reminders and extended deadlines, in order to give the contact persons a longer period to reply to the questions.

The group of persons invited to the survey were participants in the first European Cluster Policy Forum in February 2018[70] nominated by the EU Member States and persons in charge of cluster policies in their countries. These were identified through desk research. The list of nominated persons was provided by the Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs of the European Commission. The contact persons were addressed in person, but they were given the opportunity to forward the survey invitation to another person. In addition to the online survey invitation, a Word version of the questionnaire was shared with the participants of the European Cluster Policy Forum in order to give them the opportunity to use this way of participating in the cluster policy mapping.

In total, 84 invitations were sent out to the previously identified contact persons.[71] Overall, 36 persons delivered information in answer to the questions in the online version, while five provided their answers in the Word questionnaire. After consistency checks and shifting answers for the regional level to the regional part of the analyses (see below), the final database of national cluster policies and programmes involves 36 entries for 29 countries and 30 cluster programmes covering 20 countries. Where there is more than one answer for one country, these answers mostly referred to different cluster programmes. All answers were included into the analysis in order to include all available assessments and perceptions.

The majority of the respondents work in a national ministry, but the database also contains answers from government and project management agencies and further types of actors. The respondents are in charge of a broad range of activities, the most important being the design and strategy-building of cluster programmes, implementing and/or managing cluster programmes, consulting and/or advice on clusters and related aspects, as well as designing and strategy-building of research, technology or innovation programmes (ten or more answers).

Currently, not all countries have dedicated cluster programmes in place, but provided information on other approaches to supporting clusters in their countries. In some countries, more than one programme is in place; detailed information on up to three programmes could be given by using the filtering options of the questionnaire or for answering the questionnaire for each cluster programme. The full set of information is

[70] http://ec.europa.eu/growth/content/first-european-cluster-policy-forum-sets-agenda-discussions-eu-countries_de, https://www.clustercollaboration.eu/news/european-cluster-policy-forum.

[71] This includes additional addresses which were searched for the case of invalid e-mail addresses (3 cases) and contacts identified and received in the course of the survey.

integrated in table 2, while annex B provides additional information on cluster programmes which is referred to in this report. After completion of the analyses, the representatives of the Member States were given the opportunity to update and comment; this information is included in this report.In accordance with the envisaged design of the stocktaking exercise, the online cluster programme survey also covered a selection of **European regions**. This selection includes the model demonstrator regions of the European Observatory for Clusters and Industrial Change (EOCIC).[72] This group was enlarged through a set of further regions in larger European countries or regions with cluster policies in place. A list of regional stakeholders in charge of cluster or related policies in 19 European Member States was compiled, and 175 survey invitations were sent out in July 2018.[73] As in the national survey, the contact persons were given the possibility of forwarding the questionnaire to another person. In total, the regional database covers 54 entries from 16 countries and 49 regions. This includes answers for Belgium which were received in the course of the national survey.

The body of the questionnaire was identical to the national one, but the introductory questions were adapted to the regional situations. These modifications aimed to include cases where regions have a regional strategy or policy, but currently no specific cluster programme in place. In addition, the regional questionnaire contained a set of additional questions that referred to their economic situation and assessments of regional clusters and cluster engagement. Questions related to objectives and characteristics of cluster programmes were asked in a general manner for all programmes in place. Table 5 contains an overview of cluster support in the regions included in this analysis. This includes the current strategies pursued as well as information on cluster programmes. Respondents were given the opportunity to mention the number of programmes in place, and add the names of up to the three most important.

Most regional representatives work in a regional ministry or department of a regional administration. Some respondents work in government agencies, and three answers came from people who are employed in a regional development agency, a public-private partnership or a cluster organisation. Most of them are in charge of designing, implementing and/or managing cluster programmes, or design and strategy building of research, technology or innovation programmes (more than ten answers).

The countries selected for the **non-European** cluster policy examples presented in chapter 4 came from a proposal of 15 non-European countries. Pursuing the goal of providing comparable information across these non-European examples on the one hand and presenting details on key aspects which are also included in the European

[72] https://www.clustercollaboration.eu/eu-initiatives/european-cluster-observatory.

[73] from which 16 e-mails could not be delivered.

analyses on the other hand, this part of the analysis focused strongly on the presentation and development of cluster policies, on the characteristics of the cluster programmes in place, their objectives, support measures, sectoral or technological focus, achievements and future plans of cluster policies. This information was gathered through a mixed approach of targeted and in-depth literature review, phone interviews, and answers to a questionnaire designed on the base of the questionnaire to representatives of national cluster policies in European countries. In some cases, the team of the European Observatory for Clusters and Industrial Change (EOCIC) had the opportunity to discuss with cluster policy stakeholders in the countries analysed, while some other contact persons agreed to fill in the questionnaire. In cases where this was not possible, the stocktaking is based on the available literature, publicly available sources and reports. The specific information sources are mentioned at the beginning of each country section.

To collect the most relevant information, the team of the European Observatory for Clusters and Industrial Change (EOCIC) developed a 'country fiche', i.e. a structured table to which the collected information was added. These fiches formed the basis for the structured texts in chapter 4. The field phase took place in late summer and autumn 2018.

Annex B - Overview of cluster programmes

Table 8 - Objectives and focus of national cluster programmes

Country	Cluster Programme	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
Austria	Nationale Clusterplatt-form	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering R&D activities, technology development and implementation Strengthening innovation ecosystems in specific regions Supporting internationalisation activities Enhancing the visibility of clusters		-	Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries Clusters in industries under restructuring Clusters with social economy/social innovation objectives World class clusters, European Silicon Valleys
Czech Republic	Cooperation Clusters	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering R&D activities, technology development and implementation Strengthening innovation ecosystems in specific regions Supporting internationalisation activities Enhancing the visibility of clusters Supporting excellence of cluster members	10,000,000	Smart specialisation areas - mainly manufacturing industry, efficient use of resources, and information technology	Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries World class clusters, European Silicon Valleys

Country	Cluster Programme	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
Denmark	Innovation Networks	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering R&D activities, technology development and implementation Supporting internationalisation activities	25,000,000	-	Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries
Estonia	Supporting cluster development	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Supporting internationalisation activities Enhancing the visibility of clusters	1,500,000	Information and communications technology (ICT); Healthcare technology and services; More efficient use of resources	Clusters in emerging industries Clusters in mature industries Clusters in industries under restructuring
	Support for cluster development	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Supporting internationalisation activities Enhancing the visibility of clusters *Cross-sectorial and value change- based cooperation*	1,500,000	Smart specialisation areas: Information and communications technology (ICT) horizontally via other sectors; Healthcare technology and services; More efficient use of resources	Clusters in emerging industries Clusters in mature industries Clusters in industries under restructuring
	The development programme of clusters	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Supporting internationalisation activities Enhancing the visibility of clusters Supporting excellence of cluster members	1,250,000	-	Any clusters

Country	Cluster Programme	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
France	Politique des pôles de compétitivité	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering R&D activities, technology development and implementation Supporting internationalisation activities Promoting scale-ups Enhancing the visibility of clusters	Cluster organisation funding: €19m from national budget, €19m from regional budgets. Dedicated calls for R&D project funding: €58m from national budget, €58m from regional budgets (total: €144m)		Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries World class clusters, European Silicon Valleys
Germany	KMU-NetC	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering R&D activities, technology development and implementation Promoting entrepreneurship, start-ups and spin-offs Enhancing the visibility of clusters Supporting excellence of cluster members	25,000,000	-	Clusters in emerging technologies Clusters in emerging industries Clusters with social economy/social innovation objectives Any clusters *Clusters with a strong SME and an R&D focus*
	Internationali-sation of Leading-Edge Clusters, Forward-Looking Projects and	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering R&D activities, technology development and implementation Strengthening innovation ecosystems in specific regions	16,875,000	-	Clusters in emerging technologies Clusters in emerging industries World class clusters, European Silicon Valleys *Clusters and comparable networks with explicit*

Country	Cluster Programme	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
	Comparable Networks (Clusters - Networks - International)	Supporting internationalisation activities Enhancing the visibility of clusters Supporting excellence of cluster members *Enabling sustainable international cluster to cluster cooperations*			*management organizations and governance mechanisms*
	Innovationsforen Mittelstand (Innovation Fora SMEs)	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Strengthening innovation ecosystems in specific regions	4,000,000	-	Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries Clusters in industries under restructuring Clusters with social economy/social innovation objectives World class clusters, European Silicon Valleys Any clusters
Greece				Creative Industries,	Clusters in emerging industries Clusters in mature industries Clusters with social economy/social innovation objectives World class clusters, European Silicon Valleys
		Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity		Space technologies, Creative Industries, Micro-nano technologies	Clusters in emerging technologies Clusters in emerging industries World class clusters, European Silicon Valleys

Country	Cluster Programme	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
		Fostering R&D activities, technology development and implementation Strengthening innovation ecosystems in specific regions Supporting internationalisation activities			
Hungary	Hungarian Cluster Development Programme	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research *by supporting cooperative R&D&I projects* Supporting internationalisation *of cluster management and cluster members* Promoting scale-ups Enhancing the visibility of clusters Supporting excellence of cluster members *Assisting cluster merging procedure to have 10-15 leading clusters with strong international visibility* *Improving cluster management capacities (services)*	Direct (cluster management organisations): €3,000,000; Indirect (cluster members): €65,000,000	-	*No industrial focus. Horizontal support of clusters that show excellence in the following areas:* • *Innovation* • *Export* • *High level of cooperation within the cluster*
Italy	Competence Center	Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering R&D activities, technology development and implementation Strengthening innovation ecosystems in specific regions Enhancing the visibility of clusters	10,000,000	-	Clusters in emerging technologies Clusters in emerging industries
Latvia	Cluster programme	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Supporting internationalisation activities Enhancing the visibility of clusters Supporting excellence of cluster members	1,455,457	yes	Any clusters *Clusters with at least 25 members*

Country	Cluster Programme	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
		SME's export promotion			
Lithuania	Project "Promotion and Development of Innovation Networking (INOLINK)" KlasterLT	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering R&D activities, technology development and implementation Strengthening innovation ecosystems in specific regions Supporting internationalisation activities Enhancing the visibility of clusters Supporting excellence of cluster members *Stimulate integration of enterprises into clusters* *Increase maturity of clusters* *Promote growth and international cooperation*	467,914	All the clusters participating in this programme should be recognized for R&D activities	Clusters in emerging technologies Clusters in emerging industries *Selected clusters (currently: 12) can participate. Participating clusters are required to meet smart specialization and RDI criteria, thus only innovative clusters can participate.*
	Objective "Promote the development of clusters and integration in global value chains" of the Lithuanian Innovation Development Program 2014-2020 Agency for Science, Innovation and Technology	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering R&D activities, technology development and implementation Supporting internationalisation activities Enhancing the visibility of clusters Supporting excellence of cluster members *Promote the value of networking, development and their internationality. Promote cluster development and integration into the international value creation networks*		-	*This objective of the programme mostly is intended for innovative clusters*
Monte-negro	Program for stimulating the development of	Increasing competitiveness of SMEs Promoting entrepreneurship, start-ups and spin-offs Enhancing the visibility of clusters	100,000	Wood processing, tourism, food production	*The focus is on clusters in the field of wood processing, tourism,*

Country	Cluster Programme	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
	clusters in Montenegro (2 phases)	Promoting social economy and other solidarity-based initiatives for local development strategies *Formation of vertical clusters*			*food production. They have priority, others can apply*
	Improving the competitive-ness of the economy in Montenegro	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Promoting entrepreneurship, start-ups and spin-offs Enhancing the visibility of clusters Supporting excellence of cluster members Promoting social economy and other solidarity-based initiatives for local development strategies	30,000	-	Any clusters
Poland	Internationali-zation of the Key National Cluster Programme	Supporting internationalisation activities Enhancing the visibility of clusters	5,000,000	-	Clusters in emerging technologies Clusters in emerging industries World class clusters, European Silicon Valleys
	Krajowy Klaster Kluczowy	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering R&D activities, technology development and implementation Strengthening innovation ecosystems in specific regions Supporting internationalisation activities Promoting entrepreneurship, start-ups and spin-offs Promoting scale-ups Enhancing the visibility of clusters		-	Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries Clusters in industries under restructuring World class clusters, European Silicon Valleys

Country	Cluster Programme	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
		Supporting excellence of cluster members			
Portugal	Competitive-ness Cluster IAPMEI	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering R&D activities, technology development and implementation Supporting internationalisation activities Enhancing the visibility of clusters Supporting excellence of cluster members		-	Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries Clusters in industries under restructuring
Romania	Organization and development of innovative cluster	Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering R&D activities, technology development and implementation Supporting internationalisation activities Supporting excellence of cluster members	900,000	8 priority sectors of the national smart specialization strategy: Bioeconomy; ICT, Space and Security; Energy, Environment and Climate Changes; Eco-nano Technologies and Advanced Materials; Health; Patrimony and Cultural Identity; New and Emergent Technologies	Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries Clusters in industries under restructuring
	POC 2014-2020 Axis 1, Action 1.1.1, Type project: Innovative clusters	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering R&D activities, technology development and implementation Supporting internationalisation activities	7,000,000	Bioeconomy; ICT, Space and Security; Energy, Environment and Climate Changes; Eco-nano Technologies and Advanced Materials; Health; Patrimony and Cultural Identity; New	Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries Clusters in industries under restructuring

Country	Cluster Programme	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
		Enhancing the visibility of clusters Supporting excellence of cluster members		and Emergent Technologies.	World class clusters, European Silicon Valleys0
	POC/PI2.2/OS2.2/ Action 2.2.1 „Supporting the growth of added value generated by the ICT sector and innovation in the field through the development of clusters”	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering R&D activities, technology development and implementation Strengthening innovation ecosystems in specific regions Supporting internationalisation activities Promoting entrepreneurship, start-ups and spin-offs Promoting scale-ups Supporting excellence of cluster members	4,000,000	Bioeconomy; ICT, Space and Security; Energy, Environment and Climate Changes; Eco-nano Technologies and Advanced Materials	Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries
Slovakia	Scheme to support industrial cluster organisations	Strengthening cooperation structures between companies or between industry and science/research Supporting internationalisation activities	300,000	-	
Slovenia	SRIP - Strategic Research Innovation Partnerships	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering R&D activities, technology development and implementation Strengthening innovation ecosystems in specific regions Supporting internationalisation activities Enhancing the visibility of clusters	1,500,000	9 partnerships - one for each S3 pillar in Slovenia	Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries

Country	Cluster Programme	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
Spain	Agrupaciones Empresariales Innovadoras	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering R&D activities, technology development and implementation Strengthening innovation ecosystems in specific regions	10,000,000	-	Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries Clusters in industries under restructuring
Sweden	Vinnväxt	Increasing competitiveness of SMEs Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering R&D activities, technology development and implementation Strengthening innovation ecosystems in specific regions Supporting internationalisation activities Enhancing the visibility of clusters *Attractiveness for research, industry and other resources/people*	8,000,000	-	Clusters in emerging industries Clusters in mature industries Clusters in industries under restructuring World class clusters, European Silicon Valleys
United Kingdom	'Strength in Places' Fund	Fostering R&D activities, technology development and implementation Strengthening innovation ecosystems in specific regions	57,000,000	-	Clusters in emerging technologies Clusters in emerging industries Clusters with social economy/social innovation objectives

Source: European Observatory for Clusters and Industrial Change, online survey on national cluster programmes 2018 (answers for 30 programmes). Italics: additional answers given by respondents.

Table 9 - Objectives and focus of regional cluster programmes

Country	Region	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
Bel-gium	Flanders	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem Supporting internationalisation activities Enhancing the visibility of clusters Supporting excellence of cluster management	€3.000.000 for 6 spearheadclusters + €3.000.000 for 20 innovative Business networks	6 spearhead clusters: Catalisti: Spearhead cluster for sustainable chemistry and synthetics SIM: Spearhead cluster for materials FLUX50: Spearhead cluster for energy VIL: Spearhead cluster for logistics and transport Flanders Food: Spearhead cluster for agrofood Blue Cluster: Spearhead cluster for blue growth[74] Innovative business networks[75]	Clusters in emerging industries *Clusters in strategic domain for Flanders, linked to Smart Specialisation Strategy* *Bottom up clusters*
	Wallonie	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem	Wallonia Business Clusters: €500,000 Wallonia Pôles de Compétitivité: €2m	6 pôles de compétitivité, 6 sectors: Life science, Logistics, Aerospace, Green chemistry, Food industry, Mechanical engineering	Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries

[74] www.catalisti.be; www.sim-flanders.be; flux50.com; www.vil.be; www.flandersfood.com; www.blauwecluster.be.

[75] https://www.vlaio.be/nl/andere-doelgroepen/clusterorganisaties/innovation-clusters-flanders/innovation-clusters-flanders.

Country	Region	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
		Supporting internationalisation activities Promoting entrepreneurship, start-ups and spin-offs Promoting scale-ups Enhancing the visibility of clusters Supporting excellence of cluster management			World class clusters, European Silicon Valleys Any clusters
Den-mark	Hovedstaden	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem Supporting internationalisation activities Promoting entrepreneurship, start-ups and spin-offs Promoting scale-ups Enhancing the visibility of clusters Supporting excellence of cluster management	Food Network: €2m Welfare Tech: €1.7m ERDF - 1b: €800,000	Life science, Food	Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries World class clusters, European Silicon Valleys
Finland	Lappi	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation) Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Strengthening the regional innovation ecosystem Supporting internationalisation activities Enhancing the visibility of clusters	Regional Smart Specialisation Strategy (Arctic Smartness): €2m Regional Development Programme - Lapland Agreement: €25m Regional Rural Development Programme: budget included in Regional Development Programme	-	Clusters in emerging industries Clusters in mature industries Clusters in industries under restructuring Clusters with social economy/social innovation objectives New/emerging clusters Any clusters

Country	Region	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
		Promoting social economy and other solidarity-based initiatives for local development strategies			*Cross sectorial and enabling Development Environment Cluster*
	Satakunta	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation) Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem Supporting internationalisation activities Enhancing the visibility of clusters Supporting excellence of cluster management	Satakunta Regional Programme: 2018-2021 €5m Industrial Pilot Programme: €2.5m	Robotics, Automation	Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries Clusters in industries under restructuring World class clusters, European Silicon Valleys New/emerging clusters
France	Grand Est	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation) Fostering innovation capacity	Economic development, innovation and internationalisation regional strategy: around €5m Regional Innovation Strategy and Smart Specialisation Strategy: €2m	Bioeconomy, Industry of the future	Clusters in emerging technologies Clusters in emerging industries
	Hauts-de-France	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation)	Booster filière: €10m Booster innovation: €3m Booster exportation: €1m	In link with the S3	Clusters in emerging industries Clusters in mature industries New/emerging clusters

Country	Region	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
		Strengthening cooperation structures between companies or between industry and science/ research Fostering innovation capacity Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem Supporting internationalisation activities			
	Normandie	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation) Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem Supporting internationalisation activities Promoting entrepreneurship, start-ups and spin-offs Enhancing the visibility of clusters Supporting excellence of cluster management *Cluster for marine renewable energies : ONEM RDI*	Phase 3 Pôles de Compétitivité: €500m 12 filières stratégiques: €6m	-	Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries Clusters in industries under restructuring World class clusters, European Silicon Valleys
	Nouvelle Aquitaine	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation) Strengthening cooperation structures between companies or between industry and science/research	SRDEII (Regional Scheme for Growth and Innovation): €20m SRESRI (Regional scheme for Education, Research and Innovation): €15m	Cf. RIS3	Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries

Country	Region	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
		Fostering innovation capacity Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem Enhancing the visibility of clusters	3 x ERDF Regional Operational Programme (Aquitaine, Limousin, Poitou-Charentes): €12m		World class clusters, European Silicon Valleys New/emerging clusters
Ger-many	Baden-Württemberg	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation) Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering research and development (R&D) activities; technology development and implementation Supporting internationalisation activities Enhancing the visibility of clusters Supporting excellence of cluster management	EFRE-CLIP Cluster- und Innovationsplattformen 2014-2020: €2m for 7 years Internationalisierung von Cluster-Initiativen: €120,000 ClusterAgentur Baden-Württemberg: €600,000	-	Clusters in emerging technologies Clusters in emerging industries Clusters in industries under restructuring
	Bayern	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation) Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem Supporting internationalisation activities	Cluster-Offensive Bayern: €3.9m	Sectoral focus	

Country	Region	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
		Enhancing the visibility of clusters Supporting excellence of cluster management			
	Berlin	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation) Strengthening cooperation structures between companies or between industry and science/research Supporting internationalisation activities Enhancing the visibility of clusters Supporting excellence of cluster management	Common Innovation Strategy Berlin-Brandenburg: approx. €4m Operational Programme ERDF: €2m	Energy, ICT, Media+Creative Industries, Mobility/Logistics, Life Science, Photonics	Clusters in emerging technologies Clusters in emerging industries
	Hamburg	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation) Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem Supporting internationalisation activities Promoting entrepreneurship, start-ups and spin-offs Enhancing the visibility of clusters Supporting excellence of cluster management Promoting social economy and other solidarity-based initiatives for local development strategies	Clusterpolitik in Hamburg: around €4m.	Aviation, Life Sciences, Transport/Logistics, Healthcare, Creative Economy, Renewable Energy, Maritime, Media/IT	Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries Clusters with social economy/social innovation objectives World class clusters, European Silicon Valleys

Country	Region	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
	Sachsen-Anhalt	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation) Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem	Koordinierungsrahmen GRW: about €500,000	-	Clusters in emerging technologies Clusters in emerging industries
Italy	Lombardia	Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem Supporting internationalisation activities	Regional call to support 9 CTL: €1m (15 months)	Coherent with 7 areas of specialization of the RIS3, clusters as implementation tool of RIS3	Clusters in emerging industries *Regional Programme in line with the National Cluster initiatives and related areas identified*
	Piemonte	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation) Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem Supporting internationalisation activities	Regional Innovation Cluster: €1m Innovation Cluster - Line A: €20m Innovation Cluster - Line B: €10m	S3 priorities (both from the sectorial and technological point of view)	Clusters in emerging technologies Clusters in emerging industries Clusters in mature industries

Country	Region	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
		Enhancing the visibility of clusters Supporting excellence of cluster management			
The Nether-lands	Limburg	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation) Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem Promoting scale-ups	Brightlands Campussen Limburg: €40m subsidies from the regional government LimburgMakers and LimburgLogistics: €4m	Brightlands: Chem and materials, Biobased, Agro health	Clusters in emerging technologies Clusters in mature industries Clusters in industries under restructuring Clusters with social economy/social innovation objectives New/emerging clusters
	Oost-Nederland	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation) Strengthening cooperation structures between companies or between industry and science/research Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem	#in - Overijssel innopveert en internationaliseert: €4m OP-Oost: €1.5m Agenda voor Twente: €1m	High Tech Systems, Materials & MedTech	Clusters in emerging industries Clusters in mature industries Clusters in industries under restructuring
Poland	Wielko-polskie	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation)	Business Support Institutions-Business-Science Cooperation 2018: €51,000	Smart specialisations for Wielkopolska	

Country	Region	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
		Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering research and development (R&D) activities; technology development and implementation			
Portu-gal	Norte	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation) Strengthening cooperation structures between companies or between industry and science/research Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem Supporting internationalisation activities Promoting entrepreneurship, start-ups and spin-offs Enhancing the visibility of clusters Supporting excellence of cluster management	Norte Regional Operational Programme 2014-2020: €8m	Advanced manufacturing systems	Clusters in emerging industries Clusters in mature industries Clusters in industries under restructuring
Spain	Andalucía	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation) Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Promoting entrepreneurship, start-ups and spin-offs		yes	Clusters in mature industries Clusters in industries under restructuring Clusters with social economy/social innovation objectives

Country	Region	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
	Cataluña Generalitat de Catalunya gencat.cat	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Strengthening the regional innovation ecosystem Supporting internationalisation activities Enhancing the visibility of clusters Supporting excellence of cluster management *Promoting strategic change especially in SMEs*	Catalonia Clusters: €1.6m	-	World class clusters, European Silicon Valleys Any clusters
	Navarra navarra.es	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation) Strengthening cooperation structures between companies or between industry and science/research Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem Enhancing the visibility of clusters Supporting excellence of cluster management *Competitive strategy improvement to deal with future challenges specially for SMEs*	Cluster support grants for collaborative projects: €500,000 Support services from the regional development agency: €288,000	The prioritised economic areas of RIS3	Clusters in emerging industries Clusters in mature industries New/emerging clusters
	Valencia GENERALITAT VALENCIANA	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation)	Industrial Strategy Plan for Valencia Region-PEIV: €160,000 per industrial sector and year (total: €2.4m annually)	-	Clusters in emerging industries Clusters in mature industries Any clusters

Country	Region	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
		Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Strengthening the regional innovation ecosystem Promoting scale-ups Enhancing the visibility of clusters Supporting excellence of cluster management			
Sweden	Skåne län	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation) Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem Supporting internationalisation activities Promoting entrepreneurship, start-ups and spin-offs Enhancing the visibility of clusters Supporting excellence of cluster management Promoting social economy and other solidarity-based initiatives for local development strategies *Cross-clustering regionally and internationally; Issue driven innovation; Open innovation arenas*	Open Innovation Arenas add strength to cluster initiatives - Regional Cluster Development Programme 2017-2021: On average €1.6m plus additional funding for projects and activities from the regional budget	10 cluster initiatives in different sectors	Clusters in emerging technologies Clusters in emerging industries Clusters in industries under restructuring Clusters with social economy/social innovation objectives World class clusters, European Silicon Valleys New/emerging clusters
United King-dom	Derby, Derbyshire, Nottingham and	Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation)	Enabling Innovation: €7.56m INSTILS: €2.27m	Activities center around 8 key sectors: Transport Equipment Manufacturing, Food &	Clusters in emerging industries

Country	Region	Main objectives (strong/very strong focus)	Annual budget (Euro)	Specific sectoral/technological focus	Type of cluster addressed (high/very high importance)
	Nottingham-shire Enabling Innovation INSTILS (DERBY & NOTTS) GROWTH HUB European Union	Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem *Sustain and promote growth*	Catalysing growth through research for Transport Equipment Manufacturing: €1.06m	Drink Manufacturing, Transport and Logistics, Visitor Economy, Life Sciences, Creative and Digital Industries, Construction, Low Carbon	Clusters in mature industries World class clusters, European Silicon Valleys *Clusters with high productivity*
	Northamp-tonshire SILVERSTONE TECHNOLOGY CLUSTER	Increasing the competitiveness of small and medium-sized enterprises (SMEs) Industrial modernisation (e.g. through up-taking advanced technologies, digitalisation, new business models, service innovation) Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity Fostering research and development (R&D) activities; technology development and implementation Strengthening the regional innovation ecosystem Supporting internationalisation activities Promoting entrepreneurship, start-ups and spin-offs Promoting scale-ups Supporting excellence of cluster management *Skills development and accessibility*	Silverstone Technology Cluster: all private funding	Hi tech engineering, Electronics and software	World class clusters, European Silicon Valleys

Source: European Observatory for Clusters and Industrial Change, online survey on regional cluster programmes 2018 (answers for 27 regions). Italics: additional answers given by respondents.

Table 10 - Organisation and delivery of cluster support in the sample regions

Country	Region	Organisation of regional cluster policy interventions as…	Delivery of cluster support in the frame of…	Strong/very strong relationship between regional cluster support and…
Austria	Steiermark	… part of a Regional Innovation Strategy	… a regional programme	
Belgium	Flanders	… part of a Regional Innovation Strategy … *part of regional innovation and entrepreneurship support* … *part of implementation of S3 strategy in the region*	… a regional programme	
	Wallonie		… regional programme(s)	
Denmark	Hovedstaden	… part of a regional development programme … part of an EU Structural Funds Programme (e.g. ERDF Operational Programme) … a set of separate interventions and /or government involvement in cluster initiatives	… national programme(s) … regional programme(s)	National cluster policy European cluster policy
Finland	Etelä-Karjala	… part of a Regional Innovation Strategy … part of a regional development programme … part of an EU Structural Funds Programme (e.g. ERDF Operational Programme)	… regional programme(s)	
	Lappi	… part of a Regional Innovation Strategy … part of a regional development programme … part of another regional programme … part of an EU Structural Funds Programme (e.g. ERDF Operational Programme) … *part of implementation of S3 strategy in the region*	… regional programme(s) … EU/interregional programme(s) (e.g. Interreg, COSME, Horizon2020)	European cluster policy
	Satakunta	… part of a Regional Innovation Strategy … part of a regional development programme	… regional programme(s)	National cluster policy European cluster policy

Country	Region	Organisation of regional cluster policy interventions as…	Delivery of cluster support in the frame of…	Strong/very strong relationship between regional cluster support and…
France	Grand Est	… part of a Regional Innovation Strategy … part of a regional development programme	… national programme(s) … regional programme(s)	National cluster policy
	Hauts-de-France	… a programme that specifically targets cluster support … part of a Regional Innovation Strategy … part of a regional development programme	… regional programme(s)	National cluster policy European cluster policy
	Normandie	… part of a Regional Innovation Strategy … part of a regional development programme	… national programme(s) … regional programme(s)	National cluster policy European cluster policy
	Nouvelle Aquitaine	… a programme that specifically targets cluster support … part of a Regional Innovation Strategy … part of a regional development programme … part of an EU Structural Funds Programme (e.g. ERDF Operational Programme)	… national programme(s) … regional programme(s) … EU/interregional programme(s) (e.g. Interreg, COSME, Horizon2020)	National cluster policy
Germany	Baden-Württemberg	… a programme that specifically targets cluster support … part of a Regional Innovation Strategy … part of an EU Structural Funds Programme (e.g. ERDF Operational Programme) … a set of separate interventions and /or government involvement in cluster initiatives	… national programme(s) … regional programme(s) … EU/interregional programme(s) (e.g. Interreg, COSME, Horizon2020)	
	Bayern	… a programme that specifically targets cluster support	… national programme(s)	National cluster policy
	Berlin	… a programme that specifically targets cluster support … part of a Regional Innovation Strategy … part of an EU Structural Funds Programme (e.g. ERDF Operational Programme)	… regional programme(s) … EU/interregional programme(s) (e.g. Interreg, COSME, Horizon2020)	European cluster policy

Country	Region	Organisation of regional cluster policy interventions as…	Delivery of cluster support in the frame of…	Strong/very strong relationship between regional cluster support and…
	Brandenburg	… part of a Regional Innovation Strategy … part of an EU Structural Funds Programme (e.g. ERDF Operational Programme)	… regional programme(s)	
	Hamburg	… a programme that specifically targets cluster support … part of a Regional Innovation Strategy … *in a specific part (cross-innovation) co-financed with ERDF*	… regional programme(s)	National cluster policy European cluster policy
	Saarland	… part of a Regional Innovation Strategy	… national programme(s) … regional programme(s) … EU/interregional programme(s) (e.g. Interreg, COSME, Horizon2020)	
	Sachsen-Anhalt	… a programme that specifically targets cluster support … part of a Regional Innovation Strategy	… national programme(s)	National cluster policy
Italy	Lombardia	… part of a Regional Innovation Strategy … part of an EU Structural Funds Programme (e.g. ERDF Operational Programme)	… national programme(s) … regional programme(s)	National cluster policy European cluster policy
	Piemonte	… a programme that specifically targets cluster support … part of a Regional Innovation Strategy … part of an EU Structural Funds Programme (e.g. ERDF Operational Programme)	… regional programme(s) … EU/interregional programme(s) (e.g. Interreg, COSME, Horizon2020)	National cluster policy
The Nether-lands	Limburg	… part of a Regional Innovation Strategy … part of a regional development programme	… regional programme(s)	National cluster policy European cluster policy

Country	Region	Organisation of regional cluster policy interventions as…	Delivery of cluster support in the frame of…	Strong/very strong relationship between regional cluster support and…
	Noord-Nederland	… a programme that specifically targets cluster support	… national programme(s) … regional programme(s)	
	Oost-Nederland	… part of a Regional Innovation Strategy … part of another regional programme … part of an EU Structural Funds Programme (e.g. ERDF Operational Programme)	… national programme(s) … regional programme(s) … EU/interregional programme(s) (e.g. Interreg, COSME, Horizon2020)	National cluster policy European cluster policy
Poland	Wielkopolskie	… *actions financed by regional authorities*	… regional programme(s)	
Portugal	Norte	… a programme that specifically targets cluster support … part of a Regional Innovation Strategy … part of a regional development programme … part of an EU Structural Funds Programme (e.g. ERDF Operational Programme)	… national programme(s) … regional programme(s) … EU/interregional programme(s) (e.g. Interreg, COSME, Horizon2020)	National cluster policy
Slovakia	Západné Slovensko	… part of a regional development programme		
Spain	Andalucía	*Currently, specific cluster actions are being developed and a Cluster Master Plan is being prepared*	… regional programme(s)	
	Cataluña	… a programme that specifically targets cluster support	… regional programme(s)	European cluster policy
	Navarra	… a programme that specifically targets cluster support … part of a regional development programme	… regional programme(s)	

Country	Region	Organisation of regional cluster policy interventions as…	Delivery of cluster support in the frame of…	Strong/very strong relationship between regional cluster support and…
	Valencia	… part of a Regional Innovation Strategy … part of a regional development programme	… regional programme(s)	
	Skåne län	… a programme that specifically targets cluster support … part of a Regional Innovation Strategy	… national programme(s) … regional programme(s) … EU/interregional programme(s) (e.g. Interreg, COSME, Horizon2020)	European cluster policy
United Kingdom	Derby, Derbyshire, Nottingham and Nottingham-shire	… part of an EU Structural Funds Programme (e.g. ERDF Operational Programme) … a set of separate interventions and /or government involvement in cluster initiatives	… regional programme(s) … EU/interregional programme(s) (e.g. Interreg, COSME, Horizon2020)	
	Northampton shire	*Private sector led not-for-profit-organisation*	… regional programme(s)	

Source: European Observatory for Clusters and Industrial Change, online survey on regional cluster programmes 2018 (answers for 33 regions), multiple answers were possible. Italics: additional answers given by respondents

European Observatory for Clusters and Industrial Change

The European Observatory for Clusters and Industrial Change (#EOCIC) is an initiative of the European Commission's Internal Market, Industry, Entrepreneurship and SMEs Directorate-General. The Observatory provides a single access point for statistical information, analysis and mapping of clusters and cluster policy in Europe, aimed at European, national, regional and local policy-makers, as well as cluster managers and representatives of SME intermediaries.

The aim of the Observatory is to help Europe's regions and countries design better and more evidence-based cluster policies and initiatives that help countries participating in the COSME programme to:

- develop world-class clusters with competitive industrial value chains that cut across sectors;
- support Industrial modernisation;
- foster Entrepreneurship in emerging industries with growth potential;
- improve SMEs' access to clusters and internationalisation activities; and
- enable more strategic inter-regional collaboration and investments in the implementation of smart specialisation strategies.

In order to address these goals, the Observatory provides an Europe-wide comparative cluster mapping with sectoral and cross-sectoral statistical analysis of the geographical concentration of economic activities and performance, made available on the website of the European Cluster Collaboration Platform (ECCP) [76]. The Observatory provides the following services:

- **Bi-annual "European Panorama of Clusters and Industrial Change"** that analyses cluster strengths and development trends across 51 cluster sectors and 10 emerging industries, and investigates the linkages between clusters and industrial change, entrepreneurship, growth, innovation, internationalisation and economic development;
- "**Cluster and Industrial Transformation Trends Report"** which investigates the transformation of clusters, new specialisation patterns and emerging industries;
- **Cluster policy mapping** in European countries and regions as well as in selected non-European countries;

[76] https://www.clustercollaboration.eu/

- "**Regional Eco-system Scoreboard for Clusters and Industrial Change"** that identifies and captures favourable framework conditions for industrial change, innovation, entrepreneurship and cluster development;
- **Updated European Service Innovation Scoreboard**[77], that provides scorecards on service innovation for European regions;
- **"European Stress Test for Cluster Policy",** including a self-assessment tool targeted at cross-sectoral collaboration, innovation and entrepreneurships with a view to boosting industrial change;
- **Customised advisory support services** to twelve selected model demonstrator regions, including expert analysis, regional survey and benchmarking report, peer-review meeting, and policy briefings in support of industrial modernisation;
- **Advisory support service to European Strategic Cluster Partnerships**, in order to support networking between the partnerships and to support exchanges of successful practices for cross-regional collaborations and joint innovation investments;
- **Smart Guides** for cluster policy monitoring and evaluation, and for entrepreneurship support through clusters that provide guidance for policy-makers; and
- **Brings together Europe's cluster policy-makers and stakeholders** at four European Cluster Policy Forum events, European Cluster Days, and at the European Cluster Conference In order to facilitate high-level cluster policy dialogues, exchanges with experts and mutual cluster policy learning. Two European Cluster Policy Forums took place in February and April 2018, the third one will take place on 15 November in Brussels. The European Cluster Conference is scheduled for 14 to 16 May 2019 in Bucharest (Romania).
- Online presentations and publications, discussion papers, newsletters, videos and further promotional material accompany and support information exchanges and policy learning on cluster development, cluster policies and industrial change.

More information about the European Observatory for Clusters and Industrial Change is available at: https://www.clustercollaboration.eu/eu-initiatives/european-cluster-observatory

[77] Previous versions for 2014 and 2015 were developed by the European Service Innovation Centre (ESIC), see http://ec.europa.eu/growth/tools-databases/esic/index_en.htm.

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