CLUSTER ECOSYSTEM ANALYSIS

A CASE STUDY ANALYSIS OF THE CLUSTERING ECOSYSTEM IN CATALONIA

Catalan Partner
Project Partner: ACCIÓ

ACCIÓ Catalonia Trade & Investment
Generalitat de Catalunya

Website
https://www.interregeurope.eu/accelerategdt

Twitter
@AccelerateGDT

INTRODUCTION

ACCELERATE GDT brings together 7 European partners to accelerate the twin green and digital transitions by aligning supports into regional and national cluster policies, which will in turn raise SME competitiveness, build regional resilience, increase shared value, and boost recovery across Europe. The project runs from 1st March 2023 to the 31st of May 2027.

Clusters are a central feature in the European Commissions' competitiveness and Smart Specialisation strategies (DG Research, 2019). The European Expert Group on clusters found that clusters have a pivotal role in accelerating the twin green and digital transition (GDT), building resilience, and boosting recovery. During the Covid-19 pandemic, clusters demonstrated the capacity to drive change and make European value chains more resilient. Clusters can reach European firms quickly, especially SMEs and improve their innovation potential, technological uptake, skills and internationalisation.

The EU Green Deal's aim is a clean, circular, and climate neutral economy for European industry and society. Clusters can accelerate this transition towards a green economy, by identifying and supporting their members' access to green technologies, innovation, business solutions, dedicated funding and markets, and thus facilitate the green transition.

Digital solutions and the data-based economy are transforming industry and society, and the COVID-19 crisis has further accelerated this need. The EC (2021, p.14) suggests that the "digital transition requires the uptake of solutions by virtually all businesses. The transformation generates new competitive fields as it brings in new opportunities and new ways to create value." Lagers who do not develop digital components in their business model are certain to fall behind in competitiveness and growth.

ACCELERATE GDT PROJECT PARTNERS

CATALONIA[1]

Size: 32.108 sq. km[2]

Population: 7,7 million (2022)

GDP: €270.710 billion (2022)

GDP per capita: €33.400

CATALONIA REGION PRODUCTIVITY LEVELS[2]

The region of Catalonia is characterised by its high population (7,7 million) and wide surface area that spans across 32.108 square kilometres. Within this territory, Catalonia possesses mountains, inland depressions as well as a 214-kilometre-long coastline opening to the Mediterranean Sea, which has also contributed to the region's history in trade[3]. This is exemplified with a 2021 report on international trade, in which €80,1B worth of exports and €90,5B worth of imports were recorded[4]. Hereby, 'Medicaments in dosage' and 'Light petroleum distillates' stood out as the most important imports and exports. This has naturally contributed to Catalonia's economy developing into a dynamic and eclectic economic region with export capacities of diverse goods and commodities.

On a general note, Catalonia has one of the largest economies in Spain, accounting for 19% of the national GDP. Furthermore, the overall output of Catalonia by GDP per capita is measured at €33.400, which is also above both the national (€28.400) and EU (€31.200) average. Nevertheless, its annual GDP growth in % (2,81) scores slightly below the national (3,14) and EU (3,21) average. To gain knowledge and understanding of how these economic trends are reflected in the representation of economic sectors, one can observe statistics drawn from the Regional Innovation Scoreboard which showcase how the region's share in employment is dominated by Services (69,1%)[5]. Meanwhile, employment in Manufacturing (16,1%), Utilities & Construction (7,4), Public administration (5,3%) and Agriculture & Mining (1,6%) sectors take up significantly lower shares of employment in the region.

CATALONIA SECTOR SPECIALISATIONS AND EMPLOYMENT LEVELS

---

[1] This section has been adapted from Kramer, J-P. et al., Input paper to the event "Boosting talent as a key driver for a future sustainable competitiveness" – the case of Catalonia, 2022

[2] Generalitat de Catalunya (2022): Catalonia Facts & Figures. Available under: Catalonia Facts & Figures | Catalonia is a competitive economy to invest in (last accessed 02.11.2022)

[3] Fontana, J. (2014): La formació d'una identitat. Una història de Catalunya. Available under: https://books.google.be/books/about/La_formaci%C3%B3_d_una_identitat.html?id=CDPrrQEACAAJ&redir_esc=y (last accessed 02.11.2022)

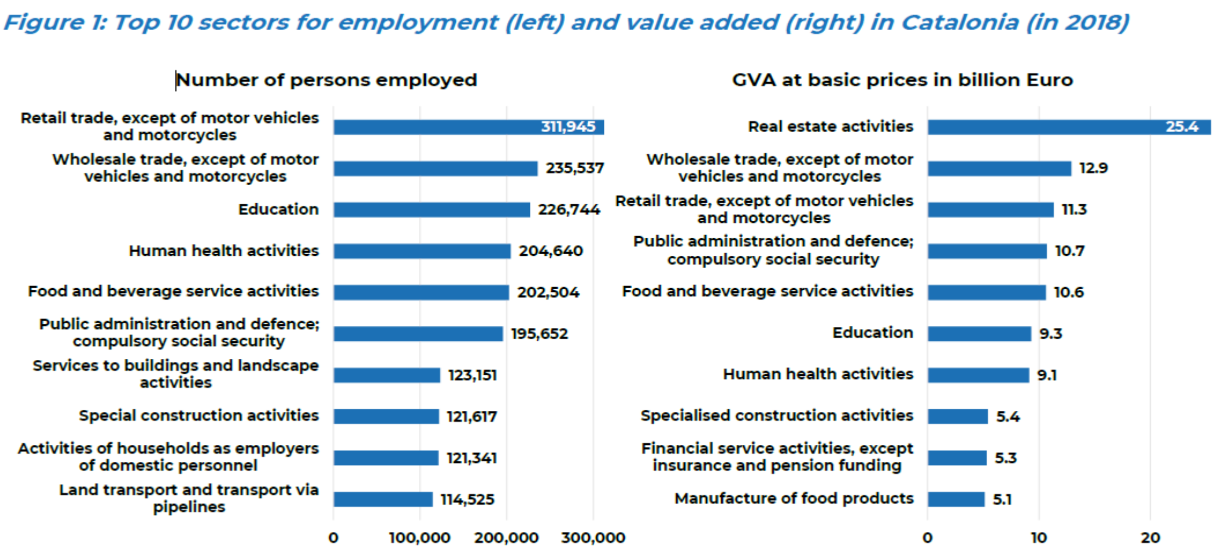
[4] OEC (2022): Catalonia: Automonous Community in Spain. Available under: Catalonia | OEC - The Observatory of Economic Complexity (last accessed 08.11.2022)

[5] Regional Innovation Scoreboard 2021 (2021): Spain. Available under: DocsRoom - European Commission (europa.eu) (last accessed: 08.11.2022).

Catalonia has a major pool of qualified local and international talent. With 12 universities, 645 master's programmes and 534 undergraduate degrees, the Catalan university system stands out for its ability to attract talent from all over the world, and Catalan business schools as IESE, ESADE, EADA (ranked as 3rd place, 12th place and 30th place in the European Business School Ranking 2023 published by the Financial Times)[6], and IE attract talent for MBAs as well.

As we present the economic profile of Catalonia, it is important to investigate how the many different sectors impact the economy as these can showcase sectoral focuses in regional economies and factor into long-term prospects. Figure 1 displays the top ten sectors of Catalonia by employment and value added. Regarding employment, sectors like "Retail trade, except of motor vehicles and motorcycles"; "Wholesale trade, except of motor vehicles and motorcycles"; "Education"; "Human health activities" and "Food and beverage service activities" stand out as the five most represented. On a different note, sectors pertaining to "Specialised construction activities" as well as "Land transport and transport via pipelines" also rank in the top 10, contributing to a diverse employment landscape in Catalonia.

FIGURE 1: TOP 10 SECTORS FOR EMPLOYMENT (LEFT) AND VALUE ADDED (RIGHT) IN CATALONIA (2018)



Source: ECCP (2022)

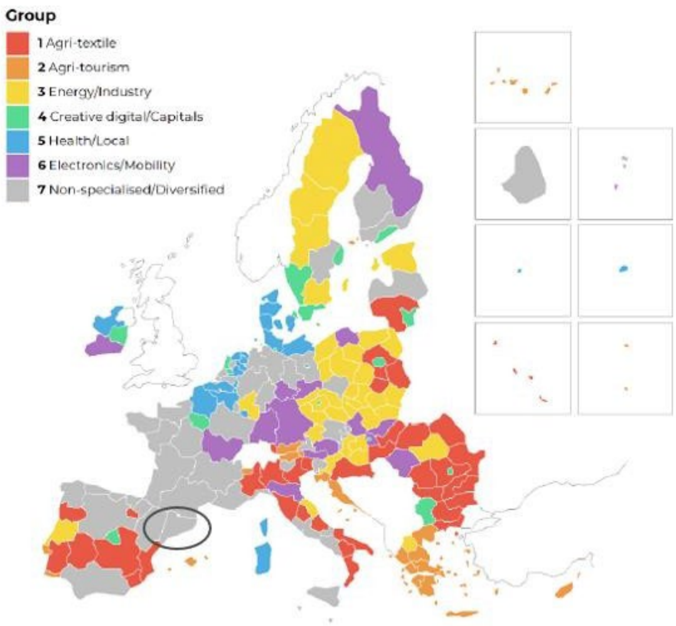
The second graph in Figure 1 displays the top 10 sectors in Catalonia concerning value added at basic prices, where "Real estate activities" ranks with the highest value of 25 billion Euro as the most important sector. This is closely followed by sectors pertaining to trade, with "Wholesale trade, exceptof motor vehicles and motorcycles" and "Retail trade, except of motor vehicles and motorcycles" accounting for 12,9 billion and 11,3 billion Euro in value added each. This corresponds to the statistics pertaining to said sectors in the context of employment numbers, underlining its significance to the Catalan economy as a whole. Another interesting statistic is that represented by sectors associated with Agri-food, with "Food and service activities" and "Manufacture of food products" accounting for 10.6 billion and 5 billion Euro in value added each.

Concerning the European Cluster Panorama report of 2021, **industrial ecosystem specialisation**

[6] Global MBA Ranking, Financial Times, 2023

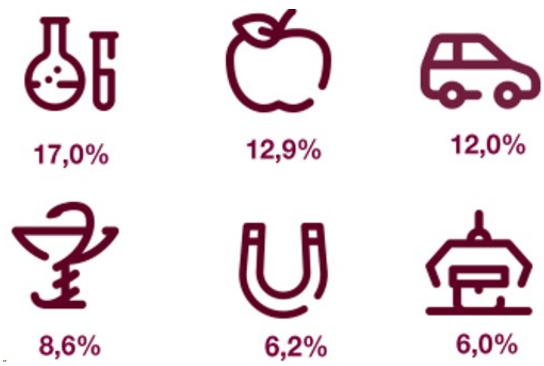
patterns are visually presented in the different regions[7]. This not only enables the analysis of cluster organisation presence on the foundation of specific typologies but also to gain an outlook of how these differ across regions and countries, respectively. As seen in the map that is presented in Figure 2, Catalonia is similar to the majority of regions in Western Europe, being defined as a non-specialisedand diversified economic region. This can be interpreted as Catalonia possessing a diversified ecosystem landscape. Given Catalonia's diversity in industrial ecosystems, cross-border cooperation can be effective in fostering further development in the region, with clusters playing a significant rolein this process. How this aligns with prevalent cluster networks and cross-border initiatives in the region of Catalonia, will be discussed in the prospective chapter.

FIGURE 2: REGIONAL TYPOLOGY BASED ON INDUSTRIAL ECOSYSTEM SPECIALIZATION



Source: European Cluster Panorama (2021).

Catalonia is a very open economy, having the highest number of regular exporting companies in Spain with 30,5% of the total. The chemical sector is the main exporting sector, followed by food and beverages and the automotive sector. These sectors jointly with the pharmaceutical sector, metallurgy sector and the machinery sector represent more than 60% of Catalan exports (62,8%) as illustrated in the figure below.



[7] European Commission (2021): European Cluster Panorama 2021: Leveraging clusters for resilient, green and digital regional economies. Available under: European cluster panorama 2021 - Publications Office of the EU (europa.eu) (last accessed: 15.11.2022).

The distribution of Catalan exports by region is:

Region	Share of the total[8]
EU-27	60,7%
Rest of Europe	12,9%
Asia	7,2%
Latin America	6,0%
Africa	4,7%
North America	4,2%
Middle east	2,7%
Oceania	0,6%
Others*	1,0%

*It basically includes non-EU supplies

The top 10 export countries for Catalonia are as follows:

Position	Country	Exports (in M€)[2]	Share of the total exports[11]
1	France	17.265,4	18,2%
2	Germany	9.429,7	9,9%
3	Italy	8.902,3	9,4%
4	Portugal	6.040,4	6,4%
5	Switzerland	4.353,9	4,6%
6	United Kingdom	4.066,7	4,3%
7	United States	3.631,0	3,8%
8	Netherlands	2.385,6	2,5%
9	China	2.357,1	2,5%
10	Belgium	2.163,4	2,3%

Regarding the imports, more than 50% of the total imports came from EU-27 and more than 25% come from Asia. The top partner countries from which Catalonia imports are China, Germany, and France.

Some more figures on trade and investment are:
- € 111,799 million imports (2022)
- € 94,927 million exports (2022) (▲18%)
- 17,469 regular exporting companies (2022)
- 8,129 Catalan companies in 128 foreign countries (2019)
- € 3,883.5 million foreign investment (2022) (▲25,6%)
- 9,155 foreign companies operating in Catalonia (2022)

REGIONAL INNOVATION LEVEL OF THE CATALONIA REGION

To round off this chapter on the economicprofile of Catalonia, one can draw on the Regional Innovation

[8] ACCIÓ based on ICEX-ESTACOM provisional data

Scoreboard (RIS) to gain an insight intothe region's level of innovativeness. According to the latest Regional Innovation Scoreboardmethodology report of 2023, a total of 21 indicators organised over four categories "Framework Conditions"; "Investments"; "Innovation Activities" and "Impacts" constitute the RIS framework.

On a first note, Catalonia is classified as Strong Innovator[9] with the region reporting an increase of its innovation performance of 11, 5% over time. The radar graph displayed in Figure 3, showcases the relative strengths of Catalonia in comparison to Spain and the EU. Regardingscientific publications, Catalonia appears to be very adept, scoring above the EU and national averagein "International scientific co-publications"; "Most-cited scientific publications" as well as in "Public- private co-publications". Although high Innovation scores on scientific publications could indicate a prioritisation in science-driven development, indicators pertaining to other significant research activities, for instance in 'R&D expenditures public & business sector' and 'PCT patent applications' donot showcase high levels of innovativeness (especially in comparison to the EU average). This is an important aspect worth highlighting, as R&D expenditures in not only the public sector but also the private sector can positively impact innovation, which is conducive to economic growth[10].

On a further note, "Above average digital skills" scoring above the EU and national average is also a positive rating, as this could be increasingly important in emerging ICT-driven sectors. One can also allude to how Catalonia performs marginally above the EU and marginally below national average in "Sales of innovative products" and slightly above the national average in "Product innovators", which could be an indication of effective development and distribution of innovative products.

---

[9] "Strong Innovator" implies that the region has a relative performance between 100% and 125% of the EU average in 2023.

[10] Hunady, J. & Pisar, P. (2021): Innovation and invention in the EU business sector: the role of the research and development expenditures". Available under: indecs2021-pp168-188.pdf (last accessed 02.12.2022) and Pegkas, P. et al.(2019): Does research and development expenditure impact innovation? Evidence from the European Unioncountries In.Journal of Policy Modeling. Available under:

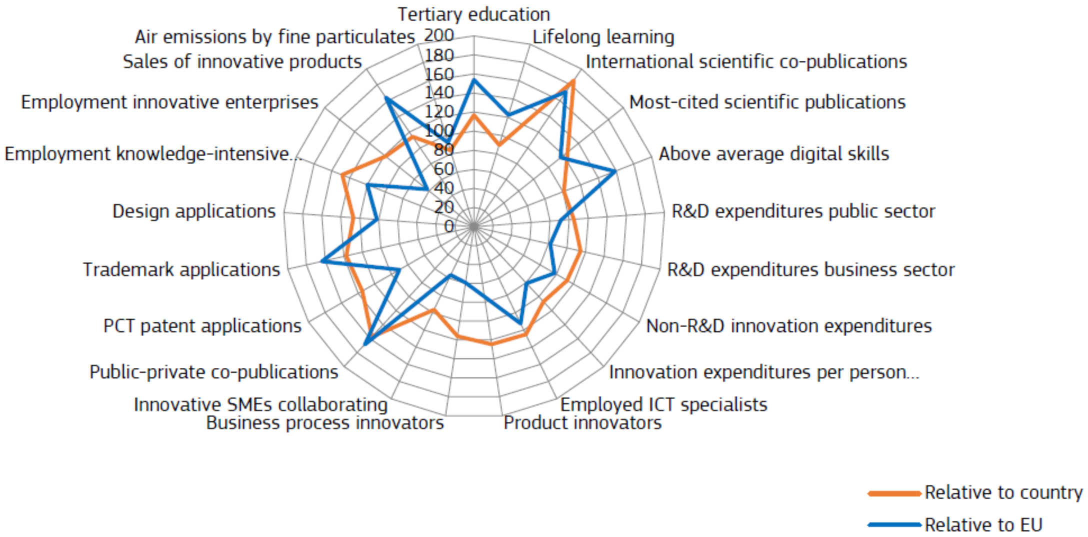


FIGURE 3: INNOVATION PERFORMANCE OF CATALONIA IN THE REGIONAL INNOVATION SCOREBOARD (2023)

Source: European Commission (2023): Regional Innovation Scoreboard 2023.

Nevertheless, it is apparent how the performance score of "Product innovators" and "Business process innovators" score significantly below the EU average. In regard to the diverse economy Catalonia, a variety of sectors like the agriculture and manufacturing industry can thrive through both "process innovation" and "product innovations", where innovation can improve production techniques for high-quality yields[11]. Therefore, these areas could be developed further in the future to help foster economic growth and high innovation performances across the diverse sectoral ecosystems in Catalonia.

LANDSCAPE AND BACKGROUND OF CLUSTERS IN CATALONIA

Catalonia has over 30 years of experience in using clusters as a key tool for competitiveness reinforcement. Our approach to working with clusters is highly pragmatic and it is based on an original methodology that focuses on strategic change as a main driver for improving competitiveness. This methodology applied since 1992 in dozens of initiatives in different industries focuses on the two main areas of micro competitiveness: upgrading a firm's business strategy and improving the quality of the business environment for that specific industry.

The Catalan model has indeed never been based on listing good or bad sectors, but rather on the understanding that all sectors have a future if they have the right strategic approach.

The main contributions of the cluster approach for companies have been a strategic rethinking based on their competitive challenges and an improvement in the quality of their business environment. This approach has also provided a new kind of dialogue between companies and the administration, with

[11] OECD. Agricultural productivity and innovation: Innovation for a more sustainable and prosperous agriculture. Available under: Agricultural productivity and innovation - OECD (last accessed 21.11.2022).

the former abandoning their more reactive nature to adopt approaches that tended to jointly reinforce competitiveness. In addition, greater and better strategic knowledge of the sectors dealt with has been obtained, which has allowed a better identification of the most appropriate instruments to help them from the public sphere.

The public-private work philosophy has been part of clusters' DNA since their beginnings. Cluster organisations therefore play the dual role of promoting the competitiveness of companies and of becoming a public policy tool for developing a specific economic segment.

Until 2009, the vast majority of initiatives had the geographical "micro cluster" as the unit of reference for competitiveness of reinforcement initiatives and the criterion for defining the cluster was "narrow", usually based on the product (furniture, agricultural machinery or motorcycles). On the other hand, the current model pivots on initiatives where the geographical scope has been expanded to cover the entire Catalan territory and the clusters are defined with a more transversal approach, based on a market segment (sports), a strategic option (gourmet) or a facilitating technology (advanced materials). The change implies, for example, moving from initiatives such as those related to knitwear companies in the Anoia region to others consisting of companies in the fashion value chain in Catalonia. In this more selective and strategic way of working, "cross-sector" or inter-cluster initiatives play an increasingly important role.

Catalonia has a leading cluster ecosystem on a global scale. In terms of the quadruple helix framework, it is easy to see the joint role that administration, academia, companies and society have played and still play in cluster policy:

• After introducing the cluster policy in 1992, the Generalitat continues to be the main promoter of this line of industrial and business policy, led since then by ACCIÓ which, despite the successive reorientations that have occurred, continues to work with the same conceptual approach.

• Regarding the generation and transfer of knowledge, Catalonia relies on major stakeholders such as business schools and technology centres on top of the specialized talent of 165 cluster professionals. Furthermore, leading organizations in the cluster environment such as the European Foundation for Cluster Excellence or the TCI Network, the most important network of cluster professionals in the world, have their headquarters in Catalonia.

• As per the business community, the third and most important part of the helix, it is to be noted the more than 2.700 members, either multinationals, SMEs, or start-ups that actively participate in the 27 active clusters in the Catalonia Clusters programme.

• Lastly, the fourth element, society, is strongly reflected in the shared value line of work that has been more recently introduced in Catalan cluster policy.

The essential characteristics of the cluster policy promoted by the Generalitat are as follows:

• Strategic change. Clusters are the optimal instrument to promote industrial change since they are based on the adoption by companies of winning business models and guide them in this process. In short, it is about breaking conventional wisdom by looking into the future.

•Efficiency. With a smaller budget allocation than other business support instruments, a very relevant multiplier effect is obtained (see the investment generated in the Competitiveness Reinforcement Initiatives as an example).

• Adaptability. The cluster's action plan fully accommodates to the needs and expectations of its companies.

•Reality. The clusters are promoted from pre-existing realities in the territory and not following trending concepts.

• Proactivity required at the start of the cluster launch process. It is a public decision with the desire to increase the competitiveness of an economic segment and not a reaction to a demand from the sector.

• Positivity. Clusters allow detecting and implementing winning business strategies, based on the core principle that every sector has a future if it implements the appropriate strategies.

• Subsidiarity. The administration outsources part of its public policies, leaving them in the hands of more flexible, focused and close structures, the clusters, with which it will coordinate so as not to duplicate efforts.

Since the beginning and up to now, the methodology implemented in Catalonia for cluster development, aligned with the best international practices, has been and is made up of analysis and process. Specifically, we talk about four phases:

1. Strategic analysis to understand the reality of the cluster. Definition of the scope, critical mass, business segmentation, international trends, strategic challenges.
2. Definition and execution of the action plan. Initiatives and projects aimed at improving the competitiveness of the 'Cluster' based on the challenges.
3. Structuring of governance, which is consolidated with the creation of a cluster organization. It is at this moment when the leadership of the initiative goes from the promoter (often a public entity such as ACCIÓ) to the beneficiaries of the entity's work (member companies and stakeholders).
4. Hiring a cluster manager to manage the initiative.

In this framework, the Generalitat created the Catalonia Clusters Programme in 2014, which deploys the cluster policy with the aim of achieving excellence in accredited Catalan clusters. This programme was created with the objective of promoting the competitiveness of the Catalan economy through clusters, systematizing the actions of the Generalitat in the field of cluster policy and contributing to the rationalization of the existing cluster map in Catalonia.

In recent years, and adapting to the evolution of society, Catalonia has incorporated Shared Value into the cluster strategy in order to adopt the latest trends and evolution in sustainability management and the model business promoting a triple impact of the associated companies in the environmental, social and economic fields.

ANALYSIS OF CATALAN CLUSTER ORGANISATIONS

Cluster organisations play the dual role of promoting the competitiveness of companies and of becoming a public policy tool for developing a specific economic segment. Clusters have become one of the most important tools in Catalonia to support regional priorities for 30 years without interruption, as Catalonia is a very diversified economy and clustering allows for economies of scale in understanding strategic challenges and implementing collaborative projects in a given business. In Catalonia, clusters have been and still are the main driver for business model innovation because they are centred in working with firms with a more focussed and unconventional approach. In fact, many cluster initiatives in Catalonia are centred not in a traditional sector but in an emerging business segment such as ICT tourism, beauty or sport.

Clusters in Catalonia act as innovation ecosystems in which SMEs, multinationals, start-ups, universities and technology centres establish relations of trust, share strategic challenges and structure transformational projects based on dynamics of coopetition (competition and cooperation).

Therefore, clusters are involved in the economic development priorities by being one of the main tools used by the government to foster the competitiveness of its business fabric. This relationship is articulated via the Catalonia Clusters Programme

The Catalonia Clusters Programme currently comprises 27 cluster organisations that together gather over 2.700 companies with a combined turnover of over 70 billion euros. They are the following:

Field	Cluster name & website
Water	Catalan Water Partnership
Audiovisual	Clúster Audiovisual de Catalunya
Beauty	Beauty cluster Barcelona
Bioenergy	Clúster de la Bioenergía de Catalunya
Bio&HealthTech	CataloniaBio&HealthTech
Meat and alternative protein	INNOVACC
Digital	Clúster Digital de Catalunya
Efficient Energy	CEEC
Home and Contract Furnishings	AMBIT
Foodservice	Foodservice Cluster
Light	CICAT
Automotive Industry	CIAC
Sports Industry	INDESCAT
Advanced Materials	MAV
Agricultural Production Means	FEMAC
Logistic and Intermodal Mobility	IN-MOVE
Fashion	MODACC
Light Mobility	Light Mobility Cluster
Packaging	Packaging Cluster
Leather	Leather Cluster Barcelona

Gourmet Products	Food Retail Catalonia Cluster
Kid's products	Kid’s Cluster
Mental Health, Neuroscience and Aging	We Mind
Educational Technologies	Edutech Cluster
Light Technologies	SECPHO
Wine	INNOVI
Real estate services	CSIM

Some structural data on the 27 Catalan cluster organisations

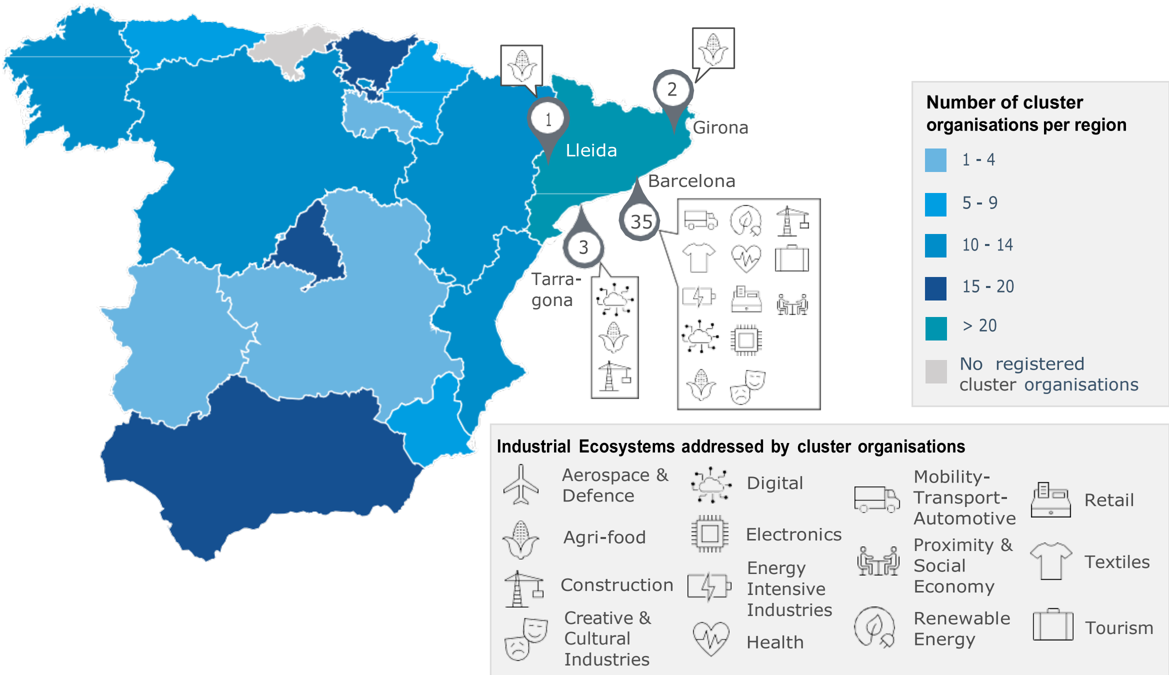
- The average age of a cluster organisation is 12,5 years, FEMAC being the oldest (over 20 years) and CSIM being the most recently established (in 2020)
- The average number of members is 116, and the average composition of a cluster in terms of the type of members includes 63% SMEs, 12% large enterprises, 12% start-ups, 7% research centres and 6% others.
- The average net income is 423.000€.
- The main services offered by clusters[12] include consulting of R&D projects, partner and supplier search, shared value services and search for funding opportunities.
- 100% of cluster organisations are staffed by at least one cluster manager and one full time equivalent. The average number of team members per cluster is 5,8.
- Regarding the figure of the cluster manager:
  - 77% are male and 23% female.
  - The average wage for a male cluster manager is 57.222€ per year while a female cluster manager earns an average of 45.000€.
- In terms of the average project manager
  - In terms of gender the situation is reversed with 73% being female and 27% male.
  - The average annual wage for a male project manager is 32.917€ and 29.096€ for a female.
- As per the role of President, 81% are males and 19% females.

Lastly, it is worth mentioning that the Catalonia Cluster Programme is an open and voluntary programme that has a set of entry requirements. Therefore, and as illustrated in the figure below[13], the ecosystem is even richer and more complex.

[12] More than 80% of the clusters offer these services

[13] Kramer, J-P. et al., *Input paper to the event “Boosting talent as a key driver for a future sustainable competitiveness” – the case of Catalonia*, 2022

Figure 4: Overview of registered cluster organisations in Spain as well as regional and sectoral distribution of active cluster organisations in Catalonia



Source: ECCP (2022). Own elaboration based on https://reporting.clustercollaboration.eu/all; last accessed 03.11.2022. A full overview of the Catalan clusters is provided in Table 2 in the Annex.

INDUSTRIAL STRUCTURE

Catalonia has a dynamic economy with over 629.876 companies (as in 2020) of which, 35.339 are industrial companies, a number that represents 18,1% of the total in Spain. Moreover, it is highly diversified, with the main branches being chemicals and plastics, food and beverage, motor vehicles, and life sciences.

The **chemicals and plastics** are the No.1 sector in Catalonia's economy, representing 18% of its industrial GVA. It is, in fact, the largest chemical hub in Southern Europe, enjoying the presence of multinational companies such as BASF, Puig, and Repsol.

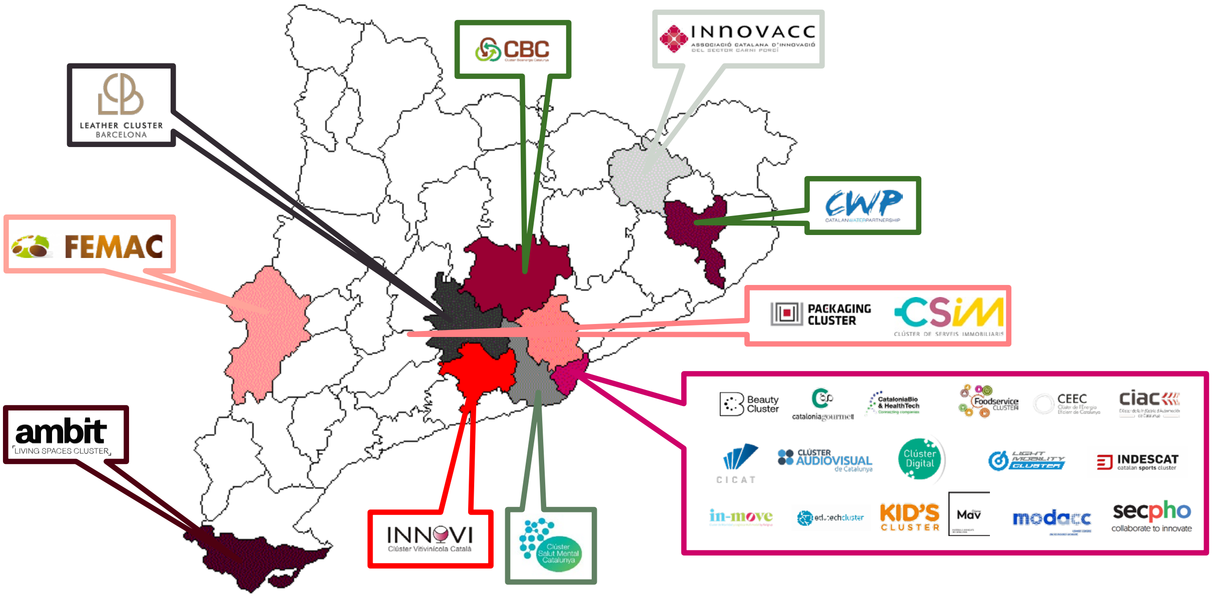
Food and beverages represent the second-largest industrial sector in Catalonia (16,1%). Most leading food companies in the world, such as Nestlé, Danone or Unilever have set up productive centres, R&D departments, and logistics activities in Catalonia.

The **motor vehicles sector** is also strong: 13,4% of the vehicles in Spain are produced in Catalonia, making it a leading automotive powerhouse in Southern Europe. The region hosts SEAT's (Volkswagen Group) automotive OEM development centre and most of the engineering units of the parts suppliers Tier 1 and 2.

Life sciences are experiencing exponential growth in Barcelona-Catalonia (9%). The region has a world-class network of medical institutions, hospitals, research centres, biotech start-ups, and pharma companies. Moreover, 40% of the top global companies in life sciences are present in Catalonia, such as AstraZeneca, Novartis, or Roche.

DEMOGRAPHIC STRUCTURE

Considering only the clusters that belong to the Catalonia Clusters Programme, most of them are located in the province of Barcelona, specifically 17 cluster organisations are headquartered in Barcelona city and 6 more in the rest of the province. There are two cluster organisations located in the province of Girona (Catalan Water Partnership and Innovacc) while there is only one cluster located in Lleida (Femac) and another one in Tarragona (Ambit).



STATE / REGIONAL SUPPORTS FOR CLUSTERING

Generally speaking, there are two main levels of cluster support in Catalonia:

1. Regional

At regional level, the main tool to support clusters is the Catalonia Clusters Programme, that consists of a capacity building programme, access to funding and sponsoring of a co-working space. The Programme is managed by ACCIÓ, the Catalan Agency for Business Competitiveness, who is the policy owner and an executive agency of the Ministry of Business and Labour.

Additionally, other Catalan Ministries may offer further support, usually linked to their specific thematic focus.

2. National

In parallel, the Ministry of Industry, Commerce and Tourism initiated in 2006 the programme to support Agrupaciones Empresariales Innovadoras (AEIs) (Innovative Business Groupings). The programme grants national recognition as AEI and provides funding for projects.

Overall, for 2022, Catalan clusters belonging to the Catalan Clusters Programme secured funding from different sources as shown in the table below:

	Origin of the grant	Quantity	Percentage of the total
	Agrupaciones Empresariales Innovadoras (AEIs)	1.174.307€	29%
	ACCIÓ (IRC scheme)	1.020.845€	25%
	European Commission[14]	1.008.380€	25%
	Others	898.210€	22%
	Total	**4.101.742€**	

CATALAN CLUSTER PROGRAMME:

As previously mentioned, in 2014, the Generalitat (Government of Catalonia) created the Catalonia Clusters Programme which deploys the cluster policy with the aim of achieving excellence in accredited Catalan clusters. The Catalan cluster programme is a voluntary programme for Catalan clusters and has three main **objectives**:

- To promote the use of clusters as a tool to reinforce the competitiveness of Catalan companies.
- To structure the intervention of the Government of Catalonia in the field of cluster policy
- To rationalise the Catalan cluster ecosystem while increasing its international visibility

So far, there have been three editions of the programme, in 2014, 2017 and the latest in 2020. Each edition lasts for three years and establishes a set of some 17 admission criteria that have gradually become more demanding.

These 17 criteria can be grouped as follows bearing in mind the cluster needs to be aligned with Catalonia's cluster policy:

[14] It corresponds to EU funding from different calls for proposals and tenders from different funding programmes.

- Scope and critical mass:
    - A cluster must have at least 60 members established in Catalonia (30 members for clusters having been in existence for less than three years).
    - A minimum aggregate turnover of 200m€, and a potential critical mass of 500m€.(150m€ and a potential critical mass of 500m€ for clusters having been in existence for less than three years).
    - Have the whole value chain and key stakeholders represented within the cluster's members.
    - Add unique value and not to overlap in terms of business segment with other clusters.

- Governance and professionalization:
    - Updated Bronze label or higher issued by the European Secretariat for Cluster Analysis (ESCA)
    - Private leadership, 70% of board members need to be companies, plus a minimum of one technology or knowledge organisation.
    - Be an independent entity from other business associations or existing institutions.
    - To have a strategic analysis and an annual action plan.
    - To have one cluster manager working full time and at least one full time equivalent having been in existence for more than three years.
    - Have own legal personality. Be not-for-profit and have as main corporate purpose the improvement of the competitiveness of companies.
    - Be mainly focused on the improvement of business competitiveness and not on lobbying or similar activities.
    - Governance robustness: Have a representative administrative body of the cluster's value chain with diversified participation of said value chain and having administrators who are committed and actively contribute to the development of the cluster.

The programme grants access to a set of permanent services, an annual capacity building programme, access to finance (described in the next section Competitiveness Reinforcement Initiatives) and the possibility to locate their headquarters in the Catalonia Cluster Hub.

The following are the permanent services clusters have access to as members of the programme:

- **Individual consulting:** Strategy support to cluster teams: co-design of the action plan, career path, member attraction, work groups.
- **Specialised advice on European programmes:** Information, call screening, guidance, proposal review, partner and consortium search.
- **Support to governance:** Participation in Executive Boards, coaching to presidents or capacity building on governance. Guidance in cluster incorporation processes.
- **Evaluation of cluster policy:** Impact analysis of clusters in business competitiveness and work environment surveys of cluster teams.
- **Clusternews**: Monthly newsletter on cluster current news.
- **Career paths:** The Hay model applied to cluster teams to define salary structure and professional development.
- **International plan:** Support in the design of cluster companies' international plans.
- **Advisory Board:** Cluster presidents debate actions carried out, future lines of work and exchange best practices.

- **Espai Catalonia Clusters:** Generation of intercluster dynamics and support services in one location.
- **Assistance before other departments in ACCIÓ**: Generalitat, ministries, European Union and multilateral organisations.
- The use of the **brand** associated with the programme
- **Shared value** initiative
- **Strategic change** initiative

The following image portrays the annual capacity building programme planned for 2023.

Activity calendar 2023

13th January 2023
Feedback evaluation for project managers
Presentation of conclusions and results of the survey carried out to cluster teams.

19th January 2023
Talent project with the Public Employment Service of Catalonia (PESC)
Status update, first outcomes and training needs designed.

27th January 2023
Training on Shared Value for cluster teams
Practical seminar to learn the specific Shared Value methodology designed in Catalonia

7th -8th February 2023
Trip to Brussels
In the frame of the EU project management course *From the call to the work plan*

23rd March 2023
Exchange of good practices for communication managers

19th -20th April 2023
International Intercluster with Ecuador
International event with another cluster ecosystem to generate synergies

9th May 2023
Training for treasurers
Training on the necessary knowledge on analysis, planning and financial monitoring of a cluster.

16th -18th May 2023
Face to Face Academy
Activity within the EU project *Euromed Clusters Forward* involving Catalan clusters

6th June 2023
10th anniversary Cases of strategic change IESE

20th -21st June 2023
Project managers' benchmarking trip to Emilia-Romagna

26th June 2023
The Day of the Business

6th July 2023
Strategic dive for cluster teams

21st September 2023
Cluster Day
Flagship event of the Catalan cluster ecosystem

October – December 2023
EU Project management course. From the call to the work plan
Tools, skills and key techniques to prepare, draft, carry out, monitor and audit a European project.

31st October 2023
Training for *general secretaries*
Key legal aspects

27th November 2023
Training in *compliance*
How to introduce compliance in clusters.

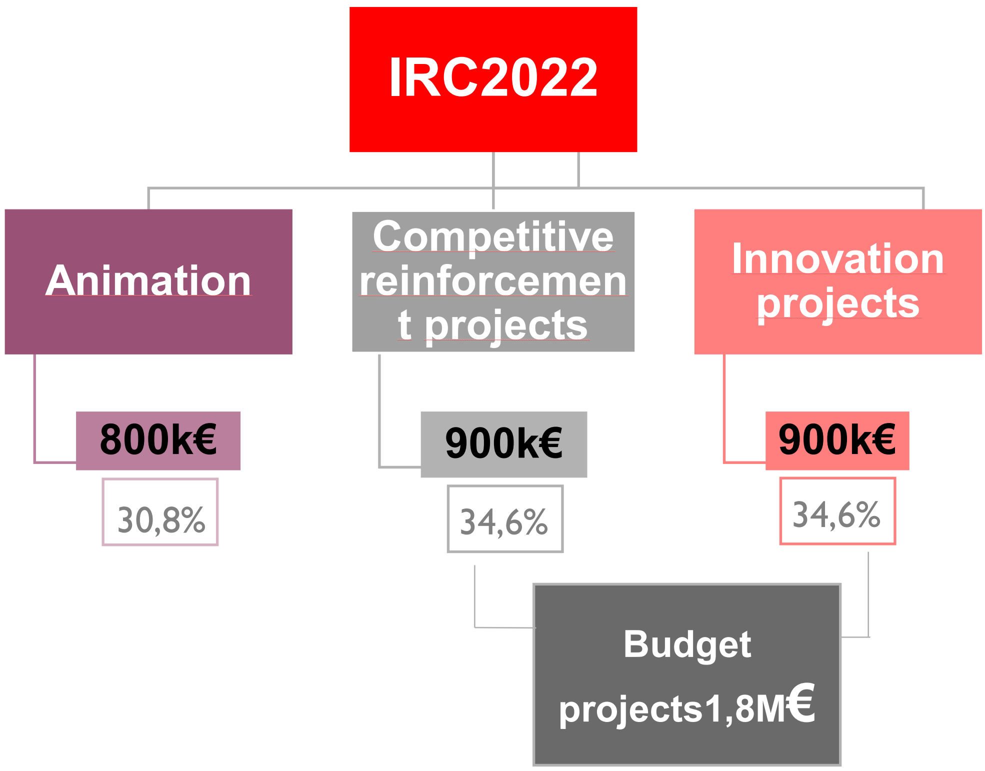
8th -10th November 2023
TCI World Congress

13th-17th November 2023
IX Strategic Cluster Week cluster managers
Benchmarking trip to an advanced innovative ecosystem to get inspired, generate international alliances and learn.

Summarising, the overall support available for clusters should include the budget available for the call Competitiveness Reinforcement Initiatives (IRC) which was of 2 million euros for 2022, the exchange value of the activities in the yearly capacity building programme and the monetary equivalent of 13 full-time equivalents, which corresponds to the team assigned to cluster-related activities within ACCIÓ.

COMPETITIVENESS REINFORCEMENT INITIATIVES (IRC)

The Competitiveness Reinforcement Initiatives is the funding scheme devoted to cluster organisations and it is managed by ACCIÓ. It essentially aims at supporting clusters to co-fund projects and some selected actions of their annual action plans.



The funding scheme consists of three strands, namely:

- Competitive reinforcement projects: It is aimed at co-financing projects intended to increase the competitiveness of member companies and clusters. Under this strand, there are different categories of projects can be funded: innovation projects (both technological and not), projects carried out by more than one cluster jointly (intercluster projects) internationalisation, projects focused on shared value, start-ups, new business trends, strategic change and talent. The budget for this stream was of 900.000€ (i.e. 34,6% of the overall budget).

- Innovation Projects: this strand is meant to co-finance projects based on the incorporation of the use of any of the 20 prioritized technological trends. There are two types of eligible projects:
  - Technical feasibility studies of innovation or development projects.
  - Innovation projects in terms of organisation and processes.

  The budget for this stream was of 900.000€ (i.e. 34,6% of the overall budget).

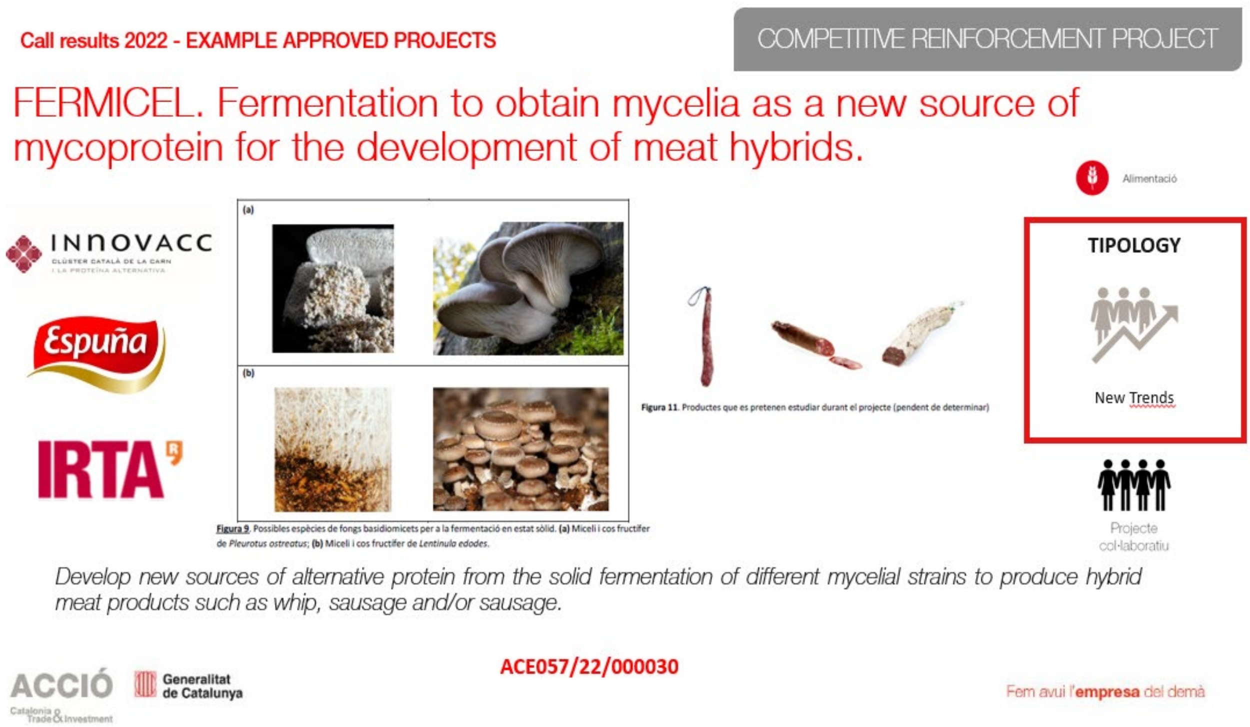
- Animation: This last strand is destined to support the co-funding of selected activities that are included in the clusters' annual action plans. These activities need to be aligned to the identified strategic challenges of the cluster and should not be basic operational activities.. The budget for this stream was of 800.000€ (i.e. 30,8% of the overall budget).

IRC 2022 project results:

Results of the first strand, Competitive reinforcement projects:

- 41 proposals submitted
- 21 funded projects (i.e. 51% of the total submitted)
- 1.506.704,18 € of investment generated (related to the public investment made)

An example of financed project under this strand was FERMICEL from INNOVACC cluster with Espuña and IRTA technology centre. The objective of the project was to develop new sources of alternative protein from the solid fermentation of different mycelial strains to produce hybrid meat products such as sausages or cold meats.



Results of the second strand, Innovation Projects:

- 22 proposals submitted
- 18 funded projects (i.e. 82% of the submitted)
- 1.503.837,39 € of investment generated

An example of financed project in this strand was EudaimonIA from the Mental Health cluster with UAB university, Casa d'Empara Fundation and SALTO company. The objective of the project was to study the feasibility of introducing a new assistance and care robot for the elderly in the residential area.

Results of strand three, Animation:

- 24 proposals submitted
- 24 funded (100%)
- 1.278.324€ investment generated

AGRUPACIÓN EMPRESARIAL INNOVADORA (AEI) (INNOVATIVE BUSINESS GROUP)

The Agrupaciones Empresariales Innovadoras (AEIs) are the main tool for industrial policy of the Ministry of Industry, Commerce and Tourism. Specifically, AEIs are defined as the combination, in a geographic space or productive sector, of companies, public or private research and training centres, involved in a collaborative exchange process aimed at obtaining benefits resulting from the implementation of joint innovation projects. AEIs must be organised around a given scientific area or technology and/or a target business segment. Additionally, AEIs must have a sufficient critical mass allowing competitiveness and international visibility of their companies (especially SMEs).

There are two kinds of AEIs:

- Emerging: Those having been established for less than four years.
- Excellent: Those able to demonstrate a high degree of performance in the development of projects and services, in terms of their own internal organisation and reaching a sustainable financing structure.

Clusters wishing to be recognised as AEI need to fulfil a set of ten criteria (including legal, industry representativeness and governance) as described in the corresponding Ministerial decree Order IET/1444/2014 de 30 de julio and the credentials are valid for a period of four years, after which, a renewal process is to be initiated.

Once duly registered as AEI, clusters may apply to for grants in three different strands supporting different actions linked to innovation and fostering collaboration among AEIs:

1. Actions to support the functioning of the AEIs (strand 1): This strand funds the launch and development of the coordination and management structures of the emerging AEIs.
2. Technical feasibility studies (strand 2): including those of a preparatory nature for research, experimental development and innovation projects.
3. Digital technology projects (strand 3)

Estudios de viabilidad técnica (Línea 2).

Proyectos de Tecnologías Digitales (Línea 3).

Specifically, in 2022 the budget for the call was of eight million euros in addition to 49,6 million euros from the Recovery and Resilience Mechanism.

The next table[15] shows the data from clusters that belong to the Catalan Cluster Programme:

Field	Cluster name	Number of projects approved	Grant
Water	Catalan Water Partnership	7	1.435.919 €
Meat and alternative protein	INNOVACC	9	988.792 €
Digital	Clúster Digital de Catalunya	4	840.141 €
Efficient Energy	CEEC	6	1.117.728 €
Home and Contract Furnishings	AMBIT	7	1.124.777 €
Foodservice	Foodservice Cluster	2	343.425 €
Automotive Industry	CIAC	9	1.646.796 €
Sports Industry	INDESCAT	3	625.555 €
Advanced Materials	MAV	2	228.418 €
Agricultural Production Means	FEMAC	1	114.821 €
Fashion	MODACC	3	299.019 €
Packaging	Packaging Cluster	4	719.151€
Kid's products	Kid's Cluster	2	335.397 €
Mental Health, Neuroscience and Aging	We Mind	2	207.112 €
Light Technologies	SECPHO	9	1.988.306€
Wine	INNOVI	7	870.054 €
		77 projects approved	**10.177.954 €**

[15] https://exteriors.gencat.cat/ca/ambits-dactuacio/afers_exteriors/ue/fons_europeus/detalls/noticia/20221014_aei-resolucio-ngeu

CONCLUSIONS – GOALS FOR POLICY LEARNING

This section presents the key experiences, challenges, and opportunities discussed within this case study, it identifies areas which can contribute to the solidification of the Catalan Cluster Ecosystem so as to ensure that it is strong enough to be able to support SMEs from across all sectors to collaboratively tackle their green and digital transitions.

COORDINATION WITH OTHER PUBLIC POLICIES

One of the topics high on the agenda to work on is increasing coordination with other public policies in order to break out silos and become better embedded in the overall policy mix. R&D and RIS policies are of particular interest.

FURTHER PROMOTION OF TWIN TRANSITIONS

Innovative and effective ways of promoting twin transitions (green and digital) using clusters as a tool. It can be either strategies, roadmaps, tools… Also, it is very relevant to learn methodologies and measures to measure the impact in an effective yet easy way.

FINAL THOUGHTS

From the Catalan perspective, it is important to keep the strategic focus of clusters. Cluster policy in Catalonia has always relied on cluster initiatives having a clear strategic focus. This feature of the policy has evolved through the years as in the early stages the focus of the initiatives was very narrowly defined (microcluster approach) and later on the scope was enlarged but subject to keeping the strategic focus.

FOR FURTHER INFORMATION

For further information you may contact:

Emma Vendrell
Team Leader of International Projects
emma.vendrell@gencat.cat

BIBLIOGRAPHY

Kramer, J-P. et al., Input paper to the event "Boosting talent as a key driver for a future sustainable competitiveness" – the case of Catalonia, 2022

Generalitat de Catalunya (2022): Catalonia Facts & Figures. Available under: Catalonia Facts & Figures | Catalonia is a competitive economy to invest in (last accessed 02.11.2022)

Fontana, J. (2014): La formació d'una identitat. Una història de Catalunya. Available under: https://books.google.be/books/about/La_formaci%C3%B3_d_una_identitat.html?id=CDPrrQEACAAJ&redir_esc=y (last accessed 02.11.2022)

OEC (2022): Catalonia: Automonous Community in Spain. Available under: Catalonia | OEC - The Observatory of Economic Complexity (last accessed 08.11.2022)

Regional Innovation Scoreboard 2021 (2021): Spain. Available under: DocsRoom - European Commission (europa.eu) (last accessed: 08.11.2022).

Global MBA Ranking, Financial Times, 2023

European Commission (2021): European Cluster Panorama 2021: Leveraging clusters for resilient, green and digital regional economies. Available under: European cluster panorama 2021 - Publications Office of the EU (europa.eu) (last accessed: 15.11.2022).

Hunady, J. & Pisar, P. (2021): Innovation and invention in the EU business sector: the role of the research and development expenditures". Available under: indecs2021-pp168-188.pdf (last accessed 02.12.2022) and Pegkas, P. et al.(2019): Does research and development expenditure impact innovation? Evidence from the European Unioncountries In.Journal of Policy Modeling. Available under:

OECD. Agricultural productivity and innovation: Innovation for a more sustainable and prosperous agriculture. Available under: Agricultural productivity and innovation - OECD (last accessed 21.11.2022).

https://exteriors.gencat.cat/ca/ambits-dactuacio/afers_exteriors/ue/fons_europeus/detalls/noticia/20221014_aei-resolucio-ngeu