Dilemmas of Mature Cluster Programmes

Experiences from Catalonia, Lower Austria and Denmark

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Why this paper?

Numerous publications are targetting the development of new cluster programmes. However, little is written about the dilemmas, challenges and opportunities that mature and successful cluster programmes face as they develop over time.

Through the experiences of some of Europe's most mature cluster policies and programmes, this paper takes a deep dive into some of the key choices in the design of a cluster programme and policy. Dilemmas such as overcoming challenges in the current programme and keeping the programme up to date with the latest trends such as green transition, digitalisation, globalisation and societal challenges through clusters.

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CLIP in a nutshell

Even longstanding and mature cluster programmes experience challenges and dilemmas as the clusters and the policies develop over time.

In the context of a Horizon 2020-Innosup-05 call for proposals, three leading cluster regions and countries - Catalonia (Spain), Lower Austria (Austria) and Denmark – met to share experiences and key learnings gathered over the years.

Early on it was clear that all three organisations experienced some of the same challenges, but the partners had in many cases taken different paths on tackling the challenges. Hence the idea with the project became clear: Dilemmas in mature cluster programmes.

#1 Evolution/Revolution of the cluster programme

#2 Multi/Single layer cluster programme

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About us

ACCIÓ

ACCIÓ is the public agency for the competitiveness of Catalan enterprise, attached to the Ministry of Business and Labour of the Generalitat (Government) of Catalonia. It aims to promote the competitiveness and growth of the Catalan business fabric by promoting innovation, internationalisation and by attracting investment. *ACCIÓ* was formally set up in 2010 as a result of the merger of the former internationalisation agency (COPCA) and the innovation agency (CIDEM), jointly totalling more than 20 years of experience in support of the Catalan business fabric. Cluster support is embedded in the Business Strategy Unit where a team of ten people provides day-to-day assistance to the clusters belonging to the Catalonia Cluster Programme. A capacity-building plan and a dedicated funding scheme together with specific support for internationalisation are the main tools deployed.

ecoplus. The Business Agency of Lower Austria

The public owned Lower Austrian business agency *ecoplus* roots back to the 1950s, initially founded to develop and manage business parks in the region. Today it offers a wide range of services to companies such as advice for investors or exporters, assists regional actors in the development and implementation of regional development projects, and implements innovation programmes on behalf of the regional government - among others the Lower Austrian Cluster Programme. Acting as a cluster management organisation in Lower Austria since 2001, *ecoplus* currently manages four cluster initiatives in the field of green building, food, plastics and mechatronics with about 570 cluster members in total.

Cluster Excellence Denmark

The national support *Cluster Excellence Denmark* has been in operation since 2010 as an integrated part of the Danish professionalisation of the clusters and the cluster policy. The organisation is privately owned and supported by the Danish Agency for Higher Education and Science along with the Danish Business Authority. The two agencies form a steering group for *Cluster Excellence Denmark* to set the direction and prioritise the activities. Currently, the main areas of activities are strategic dialogue with the cluster managers together with the agencies, competence development in form of workshops, webinar and experience exchange and internationalisation. *Cluster Excellence Denmark* has two locations in Denmark and is managed by five persons working with project management, cluster strategy, internationalisation, communication and cluster analysis.

Introduction to the project

Some words on cluster policy

Cluster policies and programmes are born as an effort to boost the competitiveness of a given territory. In the lifespan of a policy, it usually goes through different stages, its prominence fluctuates in the political agenda and ultimately it evolves.

Cluster policies have been present in Catalonia, Lower Austria and Denmark for a long time, and although the partners have known each other for more than a decade and meet regularly in cluster fora, there are not many opportunities to have a profound discussion on the respective experiences.

About the project

Thus, the CLIP project was conceived to have an organised and structured dialogue on cluster policy to share experiences, challenge the status quo to revamp policies that were born more than twenty years ago.

Like any other policy, cluster policy is made up of different components, it is complex and multifaceted. Given the project settings, a timeframe of 12 months and a very lean budget, the work required focus.

Therefore, it was decided to focus the attention on a limited number of elements that were common to all three partners.

Specifically, the three joint and specific challenges to be addressed during the lifespan of CLIP were:

1. The pertinence of evolving from a single-level cluster programme towards a multilevel approach.
2. Improving the governance model both from a cluster perspective and from the system.
3. Exploring the role and relationship of cluster policy with other policies: reaching its full potential as the intersection of several policies.

Therefore, the present Design Options Paper (DOP) does not claim to be a comprehensive document on cluster policies, programmes and the challenges faced by the three partners but a limited selection of those challenges that feel more salient at the moment of writing.

Methodology and work plan

Challenge driven meetings

Initially, the work was planned to be structured in a sequential mode: there would be an initial session on setting the scene in which the policies and programmes would be shared in order to facilitate the dialogue. Afterwards, it was planned to tackle each single challenge for about four months, each time following the same structure: a prior individual desk research and analysis, the use of local focus groups when relevant and a face-to-face meeting (Peer Learning Committee) that would be devoted to the joint discussion of the given challenge while overlapping with summarising the learnings of previous work and setting the scene for the following one.

Once work on the first challenge was completed and the second was set out, the project partners realised the discussions could not be so compartmentalised as the challenges were deeply interrelated and questions frequently overlapped. As the importance laid on the content and the process had been designed to structure the work, after nine months, the process was changed. The challenges were still at the core of the endeavour, but the work was reorganised in the form of dilemmas, taking stock of what had been dealt with and in an effort to have more productive discussions while avoiding too much overlapping.

Working on the basis of dilemmas allowed for more focused questions and more polished dialogue. Moreover, it would facilitate readability and enhanced comprehension by the reader once these were translated to the Design Options Paper.

Methodology

The reference methodology used in CLIP was the Twinning +, an extension of the original IPF twinning method which combines elements of traditional peer reviews and twinning in small learning groups of agencies responsible for the implementation of cluster programmes relevant for the scope of CLIP. The partners exchanged knowledge and experience and developed eight dilemmas that have been dealt with from a local point of view, as a test activity. The joint work of project partners together with the peer learning produced the present Design Options Paper to serve as inspiration input to regions and countries facing some of the shared dilemmas common in mature cluster policies.

Dilemma #1

Evolution or Revolution?

In the context of a fast-changing world, cluster policy and programmes need a polish over time. The programme might fall short in delivering the expected outcomes. It may need to upgrade the access criteria or the services offered. Or it must integrate new challenges like twin transitions or resilience. Reasons are diverse.

Sometimes the programmes just need some tweaks to remain relevant while other times a more profound change is necessary at a certain point to be able to move forward.

#1 – Lower Austria

Continuous evolution

Lower Austria has been pursuing its cluster policy since 2001. Clustering has proven to be a successful instrument to strengthen the innovative power of SMEs in particular through cooperation with other SMEs, leading companies and research institutions. The ongoing financial support through a multi-annual cluster programme and the close cooperation with regional policy makers provide the necessary continuity to further develop the clusters.

As a neutral cluster management organisation, the Lower Austrian business agency *ecoplus* facilitates a dialogue between business, science and the innovation policy maker, the province of Lower Austria. *ecoplus* identifies the needs from the economy and helps translating policy measures into it. This close link ensures the alignment of regional strategies and cluster activities.

20 years of experience with cooperation of companies and research within the clusters has strengthened identification with the cluster, a basis of trust and resulted in increasingly complex collaborative projects.

Necessary Change & Flexibility

However, a prerequisite for successful continuous development are mechanisms that allow for change and flexibility, such as strategy development processes involving all stakeholders to revise the focus topics of the individual clusters.

Since the first cluster initiatives in Lower Austria in 2001, the Lower Austrian cluster portfolio has also changed a lot. Cluster initiatives have been tested and launched, merged and terminated.

The prerequisite for this was a clear monitoring system for cluster performance. The indicators jointly developed by the programme owner and the cluster management organisation link the region’s economic strategy with measurable outcomes (see Dilemma #7).

The Office of the Regional Government’s Department Economy and *ecoplus* discuss the results in biannual review meetings. This dialogue ensures flexibility to respond to new challenges. Be it the need to set new regional policies, to pilot new calls, to develop new strategies together with cluster stakeholders, but also to terminate public support, if not needed or not successful anymore (see Dilemma #3).

#1 – Catalonia

Evolution – the Catalan way

Catalonia was one of the pioneer territories to apply clusters as a tool to improve the competitiveness of its economy in the early 1990s. Over the last three decades cluster policy has been able to consistently be included in the policy agenda.

Three main elements have been present since the beginning: the combination of analysis and process (defining the strategic challenges of a cluster to subsequently implement a set of concrete actions), the focus on strategic change (clusters as the environment to identify new business models and assess the strategic positioning of companies while taking into account the ever changing environment) and the public-private collaboration (clusters mainly publicly activated and driven by the private sector).

Catalan cluster policy has greatly evolved along the years (see Annex 1). It has enlarged the scope of the initiatives geographically from the initial local microcluster to today's clusters of national scope, it has shifted their definition from a purely sectoral approach to working in terms of a common strategy or market. Moreover, it has become more structured, implementing the Catalonia Cluster Programme since 2013, and it is being used as a testbed for innovative concepts such as the work on cross-sectoral collaboration or shared value.

So far, the regional authorities have typically tried to remain close to and in constant dialogue with cluster organisations in order to build an environment of mutual trust to allow competitiveness to thrive. The cornerstone of Catalan cluster policy has always lied in having specialised clusters. Critical mass is fundamental to achieving impact, but it needs to be coupled with the right degree of specialisation so as not to lose focus, a tough balance to achieve and maintain. The result is a continuous policy for almost 30 years that has not experienced radical revolutions but steady evolution.

#1 - Denmark

Denmark - the path of substantial change

Denmark has supported clusters through various programmes for almost twenty years. With great success innovating more than 18,000 companies annually, while facing challenges of a scattered and sometimes overlapping cluster landscape covering more than 40 cluster organisations in a relatively small geographic area. Some cluster organisations were funded by a national cluster programme. Others were part of regional smart specialisation strategies.

In 2018 a major reform that would revolutionise the Danish cluster programme was initiated. With many new challenges on green transition and digitalisation, the need for new and larger collaboration platforms was undeniable. The reform has disrupted the successful cluster programmes turning them into a national multilayer programme of superclusters that was launched on January 1, 2021. With many new challenges for companies on green transition and digitalisation, the need for new and larger collaboration platforms was needed.
The starting point of the reform was a thorough analysis of the entire Danish business and innovation support system. It was revealed that the system covered more than 250 stakeholders including 60+ cluster-like organisations. Something had to be done to both simplify and strengthen the clusters to make it easier for companies to locate the right cluster and avoid overlapping and competing clusters.

From analysis to new political direction for clusters

A high-level committee gave the recommendations that fewer, but bigger and stronger clusters were the future to face the challenges of tomorrow that no sole actor or entity can tackle. Thus, the number of clusters supported by public funding should be limited to ten national clusters covering selected Danish strongholds and two-four emerging areas clusters.

After the adoption of the Business Support law (2018), a profound work on identifying Danish strongholds in both the industry sectors and research areas was initiated. Strongholds that should all be anchored and managed by the new super clusters. The findings in the analysis were tested in several stakeholder workshops feeding into the new strategy “Business Promotion in Denmark 2020-2023” led by the new Danish Board of Business Development.

With the new national strategy, cluster organisations managed to gain more visibility and political momentum than ever before. Two ministries joined forces and launched the biggest cluster call in Danish history. A coordinated cluster tender was launched in collaboration between the Danish Board of Business Development and the Danish Ministry of Higher Education and Research covering 2021-2024 with a total financing of 640 mio. DKK (86 mio €). Although the call is joint, each of the two agencies fund different activities. Hence, while the Danish Board of Business Development supports more business oriented activities, the Danish Ministry of Higher Education and Research supports, in turn, more knowledge based activities.

Dilemma #2

Multi/single layer

One size fits all? Or is a targeted approach to supporting mature or emerging clusters preferable if both exist at the same time in the cluster portfolio of a region or country? Cluster ecosystems are different in different locations at different times.

Policy objectives, regional settings, natural cluster endowment, and resources are the main factors that trigger this sensitive policy choice. When it comes to layering a cluster programme, there is no single recipe.

#2 – Denmark

Implementing the first ever multilayer cluster programme

For the first time in Danish cluster history, a multilayer programme was initiated as part of the reform. Based on the new Smart Specialisation Strategy for Denmark, ten strongholds and two emerging areas were selected and consolidated in a profound dialogue process with key stakeholders across Denmark. In this respect the selection of the two cluster layers was both based on hard core statical facts and on feedback from stakeholders.

The ten strongholds were defined as:

- Environmental technologies
- Energy technology
- Food and bio resources
- Maritime and logistics
- Life science and welfare technologies
- Building and construction
- Design, fashion and furniture
- Advanced production and manufacturing
- Digital technologies
- Finance and fintech

The two emerging areas were “robot and drone technology” and “animation, games and movies”. In the application process, two additional emerging areas – “defence, space and security” as well as “sound technology” – were also identified and are now managed by a cluster organisation. The tourism sector was also acknowledged as a national stronghold. But due to the need for more focus on the local level, this area is organised in a “destination model” with a very local perspective engaging with many local players.

Multilayer depending on size and activities

By mid 2020 the new cluster call was launched. The aim was to strengthen world class innovation in the national Danish strongholds through collaboration and knowledge dissemination between companies, knowledge institutions and other actors.

With the joint call the Ministry of Education and Research and the Ministry of Industry aimed at creating stronger clusters, more cohesion between different public initiatives and more innovation power across Denmark. The name of the call was *innovation power* to underline the purpose of the call. The funding from the two agencies would vary depending on the size and the activities in each of the applications.

The call was an open competitive process for both the ten strongholds and for other emerging areas. To keep continuity and secure the wide company involvement, it was expected that only one cluster organisation per stronghold would apply. Only in the life science sector two applications were handed in. Two additional emerging areas within the defence and sound sector also applied.

After the call ten stronghold clusters and four emerging clusters received funding. In practice there is little difference between the support the two types of cluster organisations receive. They are treated as one community and can use the services from *Cluster Excellence Denmark* on an equal basis. And all cluster organisations are expected to have or get the ECEI gold label certificate.

#2 – Catalonia

Segmentation of Cluster Support

Traditionally, the Catalonia Cluster Programme was a single-layer programme, therefore all clusters had access to all services subject to fulfilling certain access criteria (see Annex 2). However, as a result of evolution, some segmented actions have been carried out.

During the CLIP project, activities, services and some elements of the Catalan approach to cluster policy were reviewed, among which the relevance of shifting from a single to a multi-layer programme. The preliminary impressions were shared with cluster managers in a working group, and several conclusions were drawn:

There were arguments in favour of a multilayer programme:
- The Catalonia Cluster Programme has over 20 clusters in different stages of development and different needs that could be grouped and hence better addressed.
- Designing tailored actions for different layers would have a clearer awareness of their own positioning and the way forward.
- The multiple layers could foster the development of a virtuous circle for all as there would be distinct goals to aspire to.

But also, there is still a case for keeping it single:
- Most global trends affect all clusters regardless. For instance, every cluster needs to work on digital and green transitions.
- Administrative costs would increase. Different access criteria, different services, and possibly different budget allocations would require more management and coordination efforts.
- Current limited budget: Distributing a limited budget into more than one layer could counteract the desired impact and would not allow fully exploiting the set-up.
- The risk of breaking the feeling of group belonging is perceived as high and there could be a loss of trust.
- Also, economies of scale would be somewhat lost as actions would be planned for a further reduced number of clusters.

The preliminary conclusion was that a flexible programme with segmented activities, and a diversity of clusters, could increase the added value of the programme.
To date, segmented actions have been targeted to a selected number of clusters given their specific characteristics to address a particular topic. Some illustrations:

Gold Label certification: Suggested to mature cluster organisations, having an adequate team/members ratio, and a well established cluster manager in the position.
Shared value pilots: Recommended for all clusters, as they do not currently have the shared value principle at the core of their strategy. The main precondition to benefit from the pilot was to have significant management and professional capacity.
The compensation plan and career path: The first pilots were aimed at clusters of different types that showed good disposition and were able to ensure a high involvement, especially of the cluster manager.

#2 – Lower Austria

Single Layer Cluster Programme in Lower Austria

Lower Austria does not rely on a multitude of small cluster initiatives, but on a certain critical mass. Currently, *ecoplus* manages four clusters: *Green Building*, *Food*, *Plastics* and *Mechatronics*, with about 570 cluster members (out of which about 490 SME) in total.

The cluster potential for these topics was evaluated in terms of critical mass, willingness to cooperate and innovative strength. Only when statistical data, interviews and workshops with stakeholders show that the target of at least 100 cluster members in the medium term, namely active companies and relevant research institutions benefiting from the cooperation, can be achieved, the region approves the support.

In 2007, the regional government changed the financial support for cluster management from individual funding projects to a seven-year cluster programme providing financial support for cluster management including technical assistance of all clusters in the region. Financial reporting is required on an annual basis. Bi-annual review meetings allow the steering of the cluster initiatives during the programme period.

Newly emerging topics are dealt with in the regularly reviewed focus topics of the existing clusters, e.g. the focus topic robotics in the *Mechatronics Cluster*.

All For One, One For All

All four cluster management teams are employees of *ecoplus*. The same rules apply to all, be it guidelines for staff qualification, project development handbooks, or a joint CRM tool. This facilitates the training of new employees and knowledge management. A joint secretariat and PR team bring synergies and efficiency.

The monitoring indicators are also the same for all four clusters, but different target values apply. The *Green Building Cluster* with 220 members and four FTE staff has higher targets for initiated innovation projects than the *Food Cluster* with 120 members and less than three FTE. The *Plastics* and the *Mechatronics Cluster* with a higher ratio of large companies have to reach a higher number of initiated projects involving these lead innovators.

Common rules of the game also make it easier to set up cross-cluster projects. These have played an increasingly important role in recent years.

Dilemma #3

Portfolio transformation

Eventually, policy makers face the dilemma of what to do with the cluster initiatives they are supporting: Should the cluster portfolio change or remain the same?

Does it make sense to launch new cluster initiatives (differentiate)? Should clusters merge into larger ones (consolidate)? Can a well-established cluster organisation change endogenously to adapt to new situations (transform)? Or is it time to end support to an underperforming cluster (terminate)?

#3 – Catalonia

A dynamic cluster portfolio

In the same way that companies are born, grow and die, the cluster portfolio is always alive. This is well reflected in the Catalan ecosystem as from the 20 cluster initiatives in place in the early 1990s, only 10% are still in place with no major change. 20% have undergone major changes in either the scope or the business, and another 20% have integrated in another initiative while the remaining 50% have disappeared (see Annex 3). Today, 40% of the current cluster organisations belonging to the Catalonia Cluster Programme are 10 years old or younger, showing the dynamism of the portfolio.
The cluster portfolio in Catalonia has typically evolved following three different paths:

Changes within their nature: Every cluster should consider its transformation, usually in line with the evolution of the sector and/or an enlargement of the territorial scope. As an example of the evolution of the sector, *Innovacc* (the pork meat cluster) is currently becoming the *Protein Cluster*. This is due to the fact that by 2040 the meat market is expected to be equally divided between animal, plant-based, and cultured meat, and *Innovacc* takes the lead in this opportunity in Catalonia.

Launching of new cluster initiatives: The underlying rationale for the launch of a new cluster initiative implies that there is an emerging segment of the economy, with sufficient critical mass and not overlapping with an already existing cluster. The initiatives that have arisen since 2008 are more transversal, cross-sectoral and defined by criteria other than the product, such as the *Kid's cluster,* characterised according to the target market: the child.

After seven years of the last initiative was initiated, two cluster initiatives were taken up in Catalonia in 2019 and 2020 respectively: The *Travel Tech* and *Waste Management* initiatives, both jointly with other government departments (see also Dilemma #6).

Merging of clusters: A widespread trend, quite easy to spot, harder to manage and with mixed results. Comparing 1993 with 2021, 20% of the initiatives merged into a new organisation and nowadays some mergers are also in process, why do clusters merge in Catalonia?

a. *Overlapping*. This situation occurs when two or more clusters share a similar value chain. Inefficiencies such as the loss of impact or scattered stakeholders are present, and the case for a merger is clear. This was the example of two clusters related to home products: *Habitat* cluster and *CENFIM* (Home and contract). The merger provided clarity to the companies, the focus was preserved, and a bigger critical mass was reached.

b. *Sector Evolution*. Sectors constantly evolve so cluster organisations should also. The mobility sector is a good example of that with a shift from a vehicle-centred approach to a user-centric approach. Thus, it is no longer coherent to have a bike cluster, one from the automotive industry, and a railway cluster; Instead, a joint *Mobility Cluster* resulting from the merger of the former three is much more powerful.

In a nutshell, efficient management and a good strategic approach are two important elements to ensure a cluster's resilience and to facilitate its further development.

#3 – Lower Austria

Changing Landscape

As already mentioned in Dilemma #1, there is also experience in Lower Austria with the merging of clusters.

Over the years, the overlap (in terms of topics and stakeholders) between the *Timber Cluster* (*2001) and the *Green Building Cluster* (*2004) became more precarious as the historical competition between certain building material groups began to be reflected more and more in the cluster world, which was not very conducive to the principle of innovation through cooperation and led to stagnation on both sides. Personnel changes in the individual teams ultimately led to the idea of a merger and in autumn 2007 the "*Building. Energy. Environment*" Cluster* emerged from the two predecessor clusters as a material- and technology-independent network for sustainable construction. The merged cluster was increasingly able to use its independence of materials for the development of new topics and technologies such as BIM (Building Information Modelling), urban cooling, etc., extending horizontally across all building materials. A platform was created that enables dialogue across building material boundaries.

* in literal translation from German, for the English communication we use "Green Building Cluster Lower Austria"

"Breaking up is hard to do"

For the termination of regional public support for cluster initiatives, there are even several examples in Lower Austria: For example, the *Wellbeing Cluster* and the *Logistics Cluster* were discontinued after a few years because despite numerous attempts it was not possible to persuade the key players in these clusters to engage in serious innovative and R&D-relevant cooperation or to ensure further development in terms of content. The monitoring clearly showed that despite a lot of events organised and inter-company training initiated, the cluster constantly underperformed regarding a key requirement of the region for clusters, namely the development of collaborative innovation projects connecting big lead companies and local SMEs.

The *Automotive Cluster Vienna Region*, a joint cluster initiative of Lower Austria and Vienna since 2001, was also discontinued in 2010, as the content-related and, above all, methodological ideas of the two federal states were no longer congruent. Whereas Lower Austrian focus is on cooperative innovation projects, Vienna aimed at location development and marketing Vienna.

#3 – Denmark

New Due Diligence Tool helped with cluster consolidation

With the new cluster programme launched in 2020, Denmark moved down the path of fewer but bigger cluster organisations. The expectation is that the strong superclusters can lead the innovation of entire industrial strongholds and ecosystems towards on a world class level better than smaller specialised clusters can do.

But the road to transforming the scattered regional cluster organisations into national superclusters has not been easy. A key success factor is that the process was led by high level representatives from the ecosystems behind the new cluster organisations. For instance, leading CEOs from the private sector, from branch organisations to university deans led the consolidation with high dedication and very fast execution of the process. In the consolidation process, new interim boards were established to organise and lead. Another key success factor was the political pressure since only one cluster organisation would get the funding to manage the stronghold. Indeed a burning platform created the pull to make the consolidation a reality.

It has taken two years with a facilitated consolidation to move from 40 cluster organisations with around 50-200 members per cluster to 14 superclusters engaging up to 200-500 member companies per cluster. Some consolidation processes have been complicated involving the merger of 4-5 independent cluster organisations into one new unit. Others were simpler with one cluster organisation in a clear position to take the lead. And in some other cases the mergers had already taken place.

Around seven out of the 14 applications for the national cluster calls were in a complicated process for consolidation. While for the others there were some discussions on whether they should merge or collaborate with other cluster (like) organisations.

Consolidation based on facts - not emotions or beliefs

The national cluster support organisation *Cluster Excellence Denmark* played a central role in the consolidation process - as a strategic sparring partner and neutral facilitator of the complex processes.

Based on previous experiences on the hardship of securing constructive and real mergers between cluster organisations, *Cluster Excellence Denmark* developed a new tool based on industry experiences on mergers: A Due Diligence Tool for clusters.

The Due Diligence Tool analysed seven different areas in the clusters (for instance members, finance, staff, activities strategy, legal setup). Here each of the cluster organisations shared their performance and data with *Cluster Excellence Denmark* that compiled the data and presented the material for the cluster boards as part of the consolidation process. Based on the feedback from the board-specific actions were agreed upon. In many cases the work was led by the chairmen of the boards, while the cluster management was part of the establishment of the new organisation.

The tool enabled the consolidation process to be led by analytical tools of each of the cluster ecosystems, making it easier to understand common strengths, differences and creating a solid ground for creating a new strategy for the cluster organisation and avoiding the classical, more emotional concerns and challenges in mergers.

Dilemma #4

Club vs. crowd

How open to new actors should or can clusters actually be? Should all innovative companies in the relevant sectors be involved in order to achieve impact for the region? Or do we need a manageable group to achieve the often-cited trust building in the cluster? There are different approaches as to how narrowly the thematic focus of a cluster is chosen.

Ultimately, it is a question of how committed the cluster members are and how actively they are contributing to the common strategic agenda.

#4 – Catalonia

Crowd or Club. Why not a crowded club?

Critical mass is a trending topic in cluster development. Generally speaking, there seems to be a correlation between big and strong clusters: tools regarding excellence in cluster management such as the Gold Label which highlights critical mass as a common characteristic of strong clusters; cluster programmes usually having an admission criterion related to critical mass, the cluster community (managers, boards, policymakers) always looking for bigger clusters. Is this correlation always desirable?

The answer to this question should be related to the cluster model. In Catalonia the main goal of cluster initiatives is to increase firms' 'competitiveness through a process of strategic change. The cluster methodology starts with a strategic analysis incorporating business segmentation, value chain and strategic challenges; it continues then with an action plan to deploy challenges into actions. Thus, the key word is strategy.

Strategy demands focus. Looking at the food sector, extremely vast in Catalonia, there are a myriad of companies competing in different businesses. A cheese manufacturer working for Harrods (gourmet retailer) is clearly in another business than a cheese manufacturer working for Lidl (mass-market retailer) or for a hotel chain (foodservice). The usual approach for crowded clusters would be to launch a single food cluster with a potential of a large number of companies.

Small is beautiful: the power of focus over size

The Catalan approach, as said connected to strategy, tries to be ambidextrous, balancing critical mass with focus. This implies that rather than having one large food cluster in the ecosystem, there are five. By definition, these are smaller but, in turn, more connected to specific strategic challenges. The *Gourmet Cluster* shares some challenges with the *Foodservice Cluster*, but there are others requiring a tailored approach.

Having said that, a bigger critical mass is always expected. All clusters, along with *ACCIÓ*, work hard to engage more companies. Proof of this is the average of 104 members per cluster reached by 2021, the highest number ever.

A minimum critical mass is a criterion to access the Catalonia Cluster Programme. However, it is not a very demanding figure if compared to the peers: 60 members (30 for recently launched clusters).

This strategic positioning of the Catalan model is constantly endorsed by empirical evidence. For instance, *Femac* (the Catalan cluster of Agricultural production means) is one of the smallest clusters and was the first in Catalonia to be certified with a Gold Label (and among the first in Europe). On the other hand, some of the bigger clusters struggle to have a strong agenda with transformative projects. And in some cluster boards, there is a current debate on the limitations to growth: how much can a cluster grow without risking losing a trusted environment?

#4 – Lower Austria

For the Benefit of the Regional Economy – beyond Cluster Membership

In Lower Austria, cluster initiatives are considered an important instrument for the innovative strength and competitiveness of the regional economy. This is reflected in the close connection to the regional economic strategy (public funding, management by business agency).

The focus of the activities is, of course, on the needs of the enterprises. However, they should not be limited to a small circle of cluster members, but should, as far as possible, radiate into the regional economy. Closed clubs cannot and should not be formed; the Lower Austrian clusters are open to all innovative enterprises in the respective cluster topics or sectors.

Lower Austria aims at having clusters with a certain critical mass (> 100 members). Specialisation takes place through the regularly reviewed focus topics in the clusters (see Dilemma #1).

One limit for accepting new members, however, is the number of cluster management employees, which must be in proportion to the number of cluster members to be supported.

Targeted Customer Service

Another aspect is that too much openness hinders members identifying with their cluster.

Every year, some members leave the cluster and new members join. Apart from internal company reasons, this is often due to projects being completed and objectives being fulfilled, or new activities being started.

For better management, the cluster managers segment the members into groups. The most important group A are innovative, active companies in the relevant value chains, group B are knowledge providers such as universities and research institutions, group C associations and other supporting entities. (Whereas companies have to pay a membership fee, groups B and C do not.) This segmentation helps not to lose focus and prioritise cluster activities.

To strengthen identification with the cluster and the "club feeling", smaller, more exclusive services are offered, such as the organisation of working groups for cluster members only (e.g. *Food Cluster*: “exchange of experience circles” on quality management, or sustainable production).

#4 – Denmark

Finding a good balance between committed and non-committed cluster participants

Over the years the Danish clusters have organised their member base quite differently. Some have been more closed and defined by the membership fees the cluster participants pay. Many of these clusters came from a more regional organisation. While others were open to all companies wanting to be part of the cluster or joining some activities facilitated by the cluster organisation. In this case many came from the national cluster programme - the “Innovation Network Programme”.

Since 2021 the European Cluster Excellence Initiative (ECEI) has been a very integrated part of the Danish professionalisation of the clusters. One of the quality management indicators of the approach defines the committed participants of the clusters and hence the non-committed members. This commitment can be defined by membership fees, a signed document stating the company’s participation in the cluster or longer participation in specific projects.

For many clusters a clearer definition on committed and non-committed participants led to new strategies focused on attracting non-committed members to become real committed members. And to exclude the free riders from the cluster community.

Over time the Danish cluster community has grown to around 18,000 companies participating in clusters; of which around 8,000 are committed cluster participants.

Danish clusters as a neutral platform for the common good

On the policy side the general push has been to make the cluster organisations open for as many companies as possible. But in some cases, it was a bit unclear which companies were actual participants in the clusters. Here, the ECEI understanding of committed and non-committed cluster participants has been very helpful.
In the new cluster call from January 2021 the new super clusters are expected to act on a non-profit basis and be a neutral platform for facilitation and reaching a broad and active circle of partners in the whole ecosystem throughout Denmark. All the new clusters have membership fees varying across the different member segments (companies, knowledge institutions and public stakeholders). In general, the fees are low (around 500 EUR) and act as a sign of dedication towards the cluster.

All activities funded by the Ministry of Higher Education and Science, are expected to be offered for free and the cluster organisation should offer activities on knowledge dissemination to the broader society and business.

In brief, the Danish approach leans towards the crowd model, but learning from previous challenges on too many free riders in some cluster organisations and unclarity on the real cluster participants, a clear understanding on who is part of the cluster is now implemented in the cluster organisation.

Dilemma #5

Capturing new trends

In a fast-changing and increasingly complex world clusters act more and more as motors of change. Cluster programmes need to provide support for identifying and embracing new trends such as green transition, digitalisation, globalisation and social challenges. Here you will find three approaches that show how cluster policies empower clusters to take leadership in bringing new trends down to earth and into companies:

- Digital and Green Transition in Lower Austria
- Shared value in Catalonia
- Internationalisation in Denmark

#5 – Lower Austria

Frontrunners for green and digital transition

The clusters often take a pioneering position in Lower Austria. They pick up on trends, test their relevance for regional companies and develop lighthouse projects whose results can be taken up by other companies.

A good example of this pioneering role in digital transformation is portrayed by the project “Enterprise 4.0.”: Already a few years ago, clusters went beyond awareness raising activities and initiated the lighthouse project “Enterprise 4.0”, in which 10 companies worked with researchers on concrete digital solutions. Also, the *Green Building Cluster* is a leader, having already initiated more than 20 collaborative projects helping SMEs to use Building Information Modelling technologies and thus remain competitive.

All four Lower Austrian clusters also focus on green transformation with projects for energy and resource efficiency, the replacement of fossil fuels with renewable raw materials, circular economy or adaptation to climate change. E.g. in the recently started flagship project “Climate 4.0” ten companies from different clusters work on solutions to reduce CO2 emissions.

How to make this visible?

Despite this frontrunner role, the contribution of Lower Austrian clusters to digital and green transformation has not yet been measured systematically.

The existing monitoring system indicates how many companies are active in cooperation projects and in which type of projects (qualification, product development, process optimisation, etc.) or whether the large leading companies of the region are involved.
Yet, indicators on digital and green solutions, such as the ones Catalonia already uses to monitor its Smart Specialisation Strategy, are missing in Lower Austria so far. Respective new indicators will be developed in the revision of the monitoring system in 2022.

#5 – Catalonia

Embracing Shared Value

ACCIÓ came across the concept of shared value at the TCI World Congress in Monterrey in 2014. At that time, it emerged as a new niche management approach just implemented by a few multinationals.

A few years later, in 2017, *ACCIÓ* started deploying a specific pilot programme on generating shared value through clusters. Why?

- Capitalism is undergoing a process of transformation towards becoming more conscious.
- All companies, regardless of size or sector, are increasingly being held accountable by their stakeholders.
- Practical tools are needed to implement this new vision into business models.
- Clusters are a great tool to sophisticate firms' strategies and to orchestrate partnerships, (private-private, public-private) most necessary for grand challenges.

An original methodology was devised to help firms create shared value through cluster initiatives using the Bcorp tools. The main outcomes of these cluster agendas are:

- An identification of new business opportunities related to shared value.
- An international benchmark of these shared value initiatives.
- A specialised training and individual coaching for firms to implement some of the Bcorp tools.

By January 2022, half of the clusters members of the Catalonia Cluster Programme (i.e. 12 clusters) had developed a shared value agenda thanks to these pilots. The goal is to reach all clusters by the end of 2023 which represents having an impact on more than 2,000 firms.

A couple of strategic implications about this process. Firstly, a great way to transform a potential trend into practice is to start with pilot actions involving two or three clusters, to learn and fine-tune and afterwards roll it out to the whole ecosystem. Secondly, the cluster methodology reaches its full potential when it leads the way in new competitiveness trends, and not just follows the wave.

#5 – Denmark

New Models for Internationalisation through clusters

During the past 15 years, the Danish clusters have been on an internationalisation journey. In the early days the international activities were less strategic and more driven by random choices. Today the Danish clusters reach out to 70 countries around the world. They have become more global. And they collaborate with a broad range of international stakeholders to support companies wanting to internationalise.

All 14 Danish superclusters are expected to have an international outlook because innovation, competitiveness and knowledge are global. However, there are differences in the internationalisation efforts of the Danish clusters. Some are working with very deep international innovations; others are more involved in exports. Some are very advanced in their internationalisation journey with selected key hotspots around the world. A few are newcomers. Finally, there are some re-defining their focus as part of the consolidation process.

To lift the internationalisation efforts in all the cluster organisations, a set of new models for internationalisation were developed based on the current paths of internationalisation that each of the clusters are working with. The aim of this project was for cluster policy makers, authorities and internationalisation actors to gain a better understanding of how Danish clusters work with internationalisation. And for the cluster organisations to be inspired to further develop their internationalisation efforts.

Not one size fits all - different ways to internationalise

Four models were identified on how the Danish clusters are working with internationalisation:

- Test of Innovation Potential - where the clusters are tapping into the international hotspot to test the potential for collaboration and innovation,
- Global Innovation Platforms - builds up through long-term collaborations through clusters
- Testing Market Opportunities - where the short-term potentials and opportunities in a selected market are tried out and evaluated
- Strategic Partnerships in Key Markets - where complex markets are entered through innovative collaborations.

The identification of the models for internationalisation led to a clearer understanding of the role of clusters in internationalisation. They are already feeding into adjusting the Danish Ministry of Innovation and Research support for internationalisation through clusters for instance in launching a new programme for supporting international networks for RTOs and clusters. The new models have been shared and discussed with the cluster managers during several webinars and workshops on cluster internationalisation. The new publication has also led to even closer collaboration between the clusters and key stakeholders working with internationalisation. For instance, the national Innovation Fund has just issued a new strategy for internationalisation where the key role for clusters is newly integrated in this strategy.

Dilemma #6

Policy interaction

In mature cluster programmes, cluster organisations are increasingly collaborating with other policy areas related to competitiveness. The upside is that this ensures that clusters are helping to tackle new and more challenges, they support tailoring instruments such as training, research, infrastructure, etc. and thus they may receive additional funding.

The downside is the potential need for more reporting, more difficult coordination with many demanding stakeholders and an extra layer of complexity in the daily management of the clusters.

#6 – Catalonia

Connecting policies since the 1990's

Cluster policy reaches its full potential when it is interconnected with other policies given its cross-cutting nature. Yet, when cluster policy is a silo, economic resilience and employment growth remain limited.

Cluster policy supports other policies on the basis of different sectoral challenges. The best practices in this regard are probably found in some Asian countries like South Korea or Singapore where there is usually a long-term vision coupled with a more regulated and vertical policy-making style than in Europe.

Back in the 1990s, policy interaction was already identified as a relevant element of policy excellence in Catalonia. Some examples can be found from that period: the furniture cluster in la Sènia (a bit remote location) had difficulties making its companies go international. When asked, the challenge was related to local infrastructure rather than to cluster policy. A new road was built facilitating ground transportation, up until then deficient, and the situation was overcome. Around the same time, there was a powerful consumer electronics cluster in Catalonia. In order to attract and especially retain talent, a Japanese school was established. In these and other cases, the success of policy interaction was not due to a strong methodology in place but to a strong Minister for Industry.

Nowadays, efforts are particularly made when a new cluster initiative is set up. A couple of recent cases would be the *waste management* and the *travel tech cluster*. Both represent best practices of coordinated work with the Waste Agency of Catalonia and the Catalan Tourist Board respectively. Thus, *ACCIÓ* brings cluster know-how and instruments, and the other agencies contribute with specific sector knowledge and related programmes.

Looking forward, the Next Generation EU recovery plan is seen as an extraordinary opportunity for coordinated intergovernmental work. One of the flagship projects, the Alternative protein hub, involves three ministries, namely, the Ministry for Research and Universities, the Ministry for Business and Labour and the Ministry for Climate Action, Food and Rural Agenda.

However, there is room for improvement. Such is the case of the RIS3 strategy, a policy requiring coordination between the Ministry for Economy and the Ministry for Business and Labour. At the beginning of the RIS3 process, cluster participation in the research and innovation communities (one of the policy instruments) was practically negligible as cluster organisations had not been taken into account as main stakeholders in the policy design phase due to a lack of coordination. By the end of the period, a couple of clusters managed to co-lead the ONEIDA R+D community focused on design industries (fashion and home products) gathering more than 40 members and a global budget of 6 million euros.

#6 – Denmark

Securing cohesion and collaboration in the business and innovation system

With the stronger and more prominent role of the new Danish superclusters, each of the cluster organisations is expected to have a leading innovative role within its respective domain. This role also includes other policy initiatives, new funding schemes (both at the national and EU levels) and more/new stakeholders in the whole business and innovation system. Truly a dream position that has been the aim for the Danish clusters.

While the new clusters organise many public and private stakeholders within their domain, in practice, the new position has led to new challenges. One challenge is in relation to the internal coordination among the clusters: How can they represent each other? Can they act as a community? What is the mandate? How is the collaboration organised? A second challenge is in relation to the coordination around the many new initiatives where the clusters are expected to play an active role: What is the role of clusters? How do they collaborate with other entities? How to minimise administration and coordination costs?

New task force on models for collaboration

Every month all the 14 CEOs and COOs of the cluster organisations meet online for a Cluster Management Group meeting to discuss ongoing topics. This group was initiated by the CEOs due to the many ongoing common tasks and challenges in the new cluster programme. During these meetings, the topic of collaboration soon became a key area of discussion. When more specific challenges occur that need more dedicated focus, the CEOs can decide to establish a Task Force that will work on the challenge. Hence in the Cluster Management Group it was decided to establish a task force with three of the CEOs volunteering to develop concepts and models for collaboration to clarify roles and mandates.

Cluster Excellence Denmark has the role of acting as operational and strategic advisor, facilitating the meetings and gathering experiences on best (and worst) practises on both internal and external collaboration. The ambition is to make recommendations on how to ease and strengthen both the internal and external collaboration based on the cluster organisations' experiences and suggestions for better and more professional collaboration.

The task force meets on a regular basis and reports back to the Cluster Management Group meeting to update and include all CEOs/COOs in the ongoing work. Meanwhile, the different models for collaboration are being tested in practice as a range of ongoing new policy initiatives requires the participation of clusters for instance in relation to the EU React funding, the regional Lighthouse Projects or the Innomissions funded by the Innovation Fund.

#6 – Lower Austria

Lower Austrian Clusters contribute to Policies for Economy, Digitalisation, RTI Climate etc.

Over the last 20 years, the cluster management teams have become recognised partners of regional, but also national policy makers.

In addition to contributing to the Economic Strategy Lower Austria, whose goals also guide the measurement indicators for cluster performance, they also contribute to the implementation of the regional Digitalisation Strategy, the Research, Technology and Innovation Programme and the Climate and Energy Programme. They are represented in steering committees, bring in the perspective and needs of businesses and "translate" policy measures into the business community.

At federal level, the Austrian Cluster Platform facilitates the dialogue between cluster stakeholders and representatives of various policy areas, thus contributing to the successful interaction of science, research and business and to the strengthening of innovation, internationalisation and growth in domestic companies.

Cross-department investment in the Food Cluster

The *Food Cluster Lower Austria* covers the entire agri-food value chain, from agriculture and food processing to gastronomy and trade. In its focus areas, sustainable use of resources and food quality and safety, companies and knowledge providers work on innovations - from the production to the food processing, the storage and distribution of the products to the consumer.

It thus combines economic and agricultural policies. The cluster initiative is financially supported by both responsible departments. This means that, in addition to the basic financing of the cluster management by the economic department, there is also an annual financial contribution from the agricultural department which is also involved in the cluster's advisory board.

Dilemma #7

Accountability: visibility and impact of cluster policy in society

Mature cluster programmes have a range of different methods to document the impact and value of clusters. International best practices are widespread and available. In some cases, statistical data is gathered. In other cases, company surveys are conducted among the cluster members. While some clusters also share best practice or success stories to show the value. A common challenge is to define the right impact indicators, find valid data and/or to locate interesting new ways of showing the impact and value of clusters to the broader society.

#7 – Catalonia

Accountability: how to effectively transmit sophisticated metrics to a wide audience?

Cluster concepts are as powerful as difficult to communicate. Actually, one key characteristic of a good cluster practitioner is the ability to transform the technical language, the outcomes of the cluster phenomena into a compelling story for a wide array of stakeholders: small firms, policymakers, universities, venture capital, tech centres or general media.

Besides the "how" to reach the ecosystem, the other key aspect is "what" to build the cluster story upon. A formalised evaluation framework is thus essential and needs to be consistent. That said, cluster evaluation has been at the centre of cluster practitioners' debates for several years. The main reasons for that are the following:

- It is extremely difficult to demonstrate the impact of a cluster intervention. There are no direct metrics to correlate a sector's competitiveness with a cluster initiative focused on that sector.
- On the other hand, the human effect is purely a qualitative issue making it hard to quantify: How to set metrics on the social capital, such as the level of trust between the cluster members?
- Also, the results of a cluster initiative are often only observed in the long term.
- Lastly, cluster initiatives entail many intangible elements: how to quantify the injection of strategic thinking in CEO's minds?

These intrinsic difficulties regarding metrics are probably related to how powerful the accountability process is. Being aware of that, the Catalonia Cluster Programme includes a formal evaluation carried out at two levels:

- Cluster organisations' teams: a yearly survey sent to cluster managers, project managers, and chairmen gathering both quantitative data (members, budget, projects, finance..) as well as qualitative (strategic alignment, teams' satisfaction, governance support…)

- Cluster members: a survey carried out every two years collecting quantitative metrics (turnover, exports…) and qualitative as well (satisfaction with the cluster agenda, outcomes of the cluster…). A control group is also delivered to compare member firms' metrics (turnover, EBITDA, productivity…) with their non-member peers.

The results of this formal evaluation process are key not only as a tool for strategic reinforcement but also as a consistent baseline for accountability.

#7 – Catalonia

Cluster Day: preaching to the priests is never enough

In Catalonia, cluster policy has shifted over the years (see dilemma #1). During the first decade, it was used as a smart way to work with the business community (as Minister Subirà said, the father figure of the cluster approach in Catalonia). However, it kept a low profile from a communication perspective to avoid generating too much hype and lobby efforts to become cluster initiatives.

Later on, it became clear that competitiveness instruments need not only be effectively delivered but their outcomes proven to the cluster ecosystem and general economy. With this objective, Catalonia launched the Cluster Day in 2021 as the flagship event of the cluster community to strengthen accountability and reach a broader audience.

The Cluster Day aspires to become a trendsetter in the competitiveness field contributing to read how the competitive environment changes and providing some answers to companies. The first edition, held online due to the pandemic, revolved around the concept of Shared Value, featuring its capacity for triple impact, providing practical tools and showing the way forward. The upcoming edition in 2022 awaits hundreds of participants, not only to take up strategic content but to actively network on an intercluster basis.

#7 – Denmark

Strengthening the cluster narrative: Why clusters

Evaluation is deeply embedded in the DNA of any public instrument in Denmark. Also, in the cluster programme. Since the beginning of the different cluster programmes, a range of different evaluation schemes and publications have sought to document and analyse the performance and impact of clusters. So, in Denmark we don't need to show that it works in terms of lifting innovation, productivity and internationalisation – we know this for sure since Danish companies participating in the clusters are asked on a regular basis about the effect of cluster work.

While these insights are widely accepted in the public sector, there is still a need to show this documentation, present success stories and also refresh the cluster narrative. As innovation changes and clusters follow – the wording, the understanding and the explanation needs to do the same.

Among the CEOs of the cluster organisations, this challenge is seen as key to explain to cluster participants, cluster boards and the broader business and innovation system. Many of the CEOs experience challenges on explaining the cluster concept and key characteristics in an easily understood manner. Hence the CEOs decided to dedicate more time to focus on the cluster narrative.

Cluster collaboration to strengthen the cluster narrative

Late 2021 a group of four CEOs formed a task force to work on the cluster narrative in collaboration with *Cluster Excellence Denmark*. Early 2022 the group worked on a common document to explain the new cluster narrative. This document will be tested with a group of chairmen of the cluster boards and all the cluster CEOs late February 2022. Afterwards it will be integrated in different communication channels: At the cluster organisations' homepages, in social media campaigns and in broader communication.

For an overview over the different evaluation initiatives, go to *Cluster Excellence Denmark*'s Knowledge Bank at https://clusterexcellencedenmark.dk/knowledgebank/?lang=en. Besides reports, there are also links to films and best practice stories on why clusters matter in the green and digital transitions. Together with the clusters, the website https://www.innovationskraft.nu was created to showcase impact and value.

#7 – Lower Austria

Monitoring performance indicators derived from economic strategy

The Lower Austrian cluster programme is supported by European Regional Development Funds and regional funds. Public funding requires a clear monitoring system. All Lower Austrian innovation programmes are measured against their contribution to the objectives of the Economic Strategy using the Balanced Scorecard approach. The main indicators for the cluster programme are:

- No. of R&D projects involving big lead companies and regional SMEs
- No. of big lead companies actively involved in in collaborative projects
- Cooperation rate (% of cluster members actively involved in collaborative projects)
- No. of qualification projects initiated
- No. of product/service/system innovations initiated

Cluster managers and regional government discuss the results in biannual review meetings and can steer the process if necessary.

Story Telling

In order to communicate what is happening in the clusters to a wider audience, *ecoplus* uses story telling rather than facts and figures, i.e. stories not only about individual projects, but also about initiatives consisting of several activities (e.g. digital transformation of the construction sector) and to bring participating companies or researchers on the stage.

ecoplus cooperates with specialist media, makes use of network partners‘ channels, fosters social media (especially LinkedIn). In the framework of the digitalisation activities, a broad audience was reached with short video clips broadcasted on regional TV before regional news, in which cluster management staff explained digital transformation terms (www.virtuelleshaus.at/medien).

Dilemma #8

Governance

Solid cluster governance is very important in cluster programmes since this is a key factor for the cluster's success in the long term. Typical challenges and dilemmas relate to: How to create strong cluster boards? How to secure an ongoing strategic development? How to organise the cluster management? And how to consider the optimal legal and financial structure?

At the ecosystem level, the approach should be focused on policy co-design involving private and public stakeholders and securing inclusive strategy development.

#8 – Denmark

The value of independent cluster organisations

The importance of cluster organisations is well documented and acknowledged in the cluster world. Yet, the topic of different models for organisation and governance has perhaps not been in the focus of cluster development and policy. A clear and novel recommendation from the Danish cluster programme is to ensure independent cluster organisation. If the cluster organisation is expected to serve the whole ecosystem in a neutral and facilitating manner, the cluster organisation can't be hosted by one of the actors behind the ecosystem. If the organisation is hosted by one actor, the values and the strategy of the host organisation will become dominant over time and not help the cluster to develop and grow.

This recommendation is not built on belief, but on solid data and analysis. Over the years it has become clear in Denmark that different cluster organisations perform differently. To document this presumption *Cluster Excellence Denmark* compiled data from the annual Performance Account (evaluating the key performance in the clusters). This Performance Account had been conducted for almost 10 years. This huge amount of data was then correlated with six archetypes of Danish cluster organisations. These six archetypes were based on the more than 120 labels and certifications conducted on the Danish cluster organisations since 2009.

Based on this work the following six models could be described:

- Cluster organisations hosted at universities
- Cluster organisations hosted at other knowledge institutions
- Cluster organisations facilitated by other clusters/networks
- Cluster organisations collaborating regionally and nationally
- Regional cluster organisations
- Local specialised cluster organisations

#8 – Denmark

Change in the requirements of the cluster call

Each of the six cluster models was described by governance, legal and financial framework, management, leadership, activities, internationalisation and cluster secretariat. With the data from the Performance Account it was possible to describe the respective strengths and weaknesses in each of the models to a quantitative level.

One model outperformed the others by far: Cluster organisations collaborating regionally and nationally. Here the regional strongholds got national strength and all of them were led by companies on the boards.

Another key feature was the legal and financial independence as these clusters were organised as private foundations or associations (but not lobby associations). This insight led to a change in the cluster call in 2021, so any cluster organisation should have own legal entity to maximise the impact of the Danish cluster organisations allowing the clusters to fully work with their own strategy - and not allow the interest of some hosting organisation.

#8 – Lower Austria

Governance at cluster level – involvement of stakeholders

Unlike clusters in other countries, the clusters in Lower Austria do not have their own legal personality. The business agency *ecoplus* is the central cluster management organisation for all four clusters. Consequently, the clusters also have no management board made up of cluster members. However, cluster members are of course actively involved in the clusters' agenda development and implementation.
Interaction with stakeholders takes place on several levels: Next to the direct interaction with members in bilateral meetings and in projects, there is an advisory board consisting of representatives of companies, research organisations and policy makers.

The cluster manager and her/his team coordinate the cluster strategy development process, but the content input to the strategy involves all relevant sources and perspectives:

- Interviews conducted with experts, scientists, associations
- Survey of companies
- Discussion with the advisory board
- Benchmarking of clusters in Austria and internationally
- Trend analysis: screening of specialist media, conference topics, funding programmes

All these inputs contribute to the definition of cluster focus topics along with the following questions:

- Does the topic have the potential to significantly increase competitiveness?
- Does it help to reach the relevant target community?
- Does it improve the competitive situation of the cluster?
- Does it have an effect on the steering system?

#8 – Catalonia

Promoting robust cluster boards

The governance structure is a key factor for the cluster's success, facilitating decision-making and enabling accountability and the organisation's sustainability in the long term.

Thus, ever since the Catalonia Cluster Programme was first launched back in 2014, governance has been included as an access criterion. Currently, it is required that the Board is made up of a minimum of 70% of private companies and a minimum of a technology or knowledge stakeholder.

To nurture the robustness of the governance, when a cluster organisation is under the process of becoming institutionalised or when there is a significant change in the composition of the Board, *ACCIÓ* organises a set of capacity building actions.

The topics tackled in these sessions comprise:

- Expectations of a Board: keep the strategic focus of the cluster and its uniqueness. The Board is also asked to have capacity to rethink business models as the competitive context is in constant evolution and the cluster needs to adapt to be able to strive. It also is in charge of ensuring a qualitative critical mass to allow sustainable growth and to allow for transformative projects.
- To set up and maintain a solid financial model to guarantee the sustainability of the organisation.
- The profile of the Board members: personal commitment with innovation, willingness to break with conventional wisdom, vision, business ambition, ability to work in a group, resilience.
- Ideal composition of the Board: representing the cluster's value chain, including new players, private leadership, critical mass (10-13 members), and both proactive –generating projects- and operational.
- Shared vision.

#8 – Catalonia

Governance of the ecosystem: The Advisory Committee

Traditionally, the connecting link between the public administration and cluster organisations has fallen on the figure of the cluster manager. In an effort to enrich and diversify the relationship, the Presidents of the cluster Boards were included as relevant stakeholders at the time the Catalonia Cluster Programme was set up. Presidents tend to be entrepreneurs and, as such, speak on behalf of the cluster's companies, hence their observations are instrumental to boost cluster policy forward.

In the framework of the set of actions yearly planned to support cluster organisations to increase their competitiveness, there is an instrument set aside specifically for cluster Presidents: The Advisory Committee.

The Advisory Committee meets twice a year and gathers clusters' Board presidents, the person responsible for the Cluster Programme from *ACCIÓ* and a political representative (usually the Minister)

These sessions usually last a whole morning and have the main aim of co-designing the cluster policy as well as sharing knowledge and best practices with the focus on strategy.

The first part is devoted to take stock of the main actions carried out and identify common challenges. Afterwards, an open discussion takes place where cluster Presidents have the opportunity to share their main successes and discuss key strategic issues.

The resulting feedback is used as a learning process to fine-tune the services provided in the framework of the programme.

Joint learnings

The project has represented an enriching experience for the three partners. There are three elements to be highlighted as success factors for this positive exchange. First, the partners have known each other for over ten years so there was already a good knowledge base to work from and no need to start from scratch.

Secondly, there was a climate of mutual trust that has greatly facilitated the exchanges and made work more efficient. And lastly, the three are in a similar stage of maturity in terms of cluster policy and programme, hence the language, the background has smoothed the path towards finding common areas of work.

The project has been a flexible journey. The selection process of the eight dilemmas is a lesson learnt.

Lower Austria

The discussion with experienced cluster support organisations has further highlighted to us the importance of mechanisms for change in cluster policy and cluster strategies in order to be able to react to or even anticipate changes in the economic and innovation landscape - mechanisms allowing for flexibility in order to push for the next level of cluster development. The continuous communication with cluster members and policy makers, an adequate monitoring system and a process for the adaptation of cluster strategies are mechanisms in Lower Austria that allow this flexibility. They have brought a continuous evolution of cluster development.

Our main take-away from the exchange of experience with *ACCIÓ* and *Cluster Excellence Denmark* is the inspiration for further improvement of the Lower Austrian Cluster Monitoring System reflecting the clusters' contribution to green and digital transformation. Inspiration came from the Catalan RIS3 monitoring indicators as well as from the comprehensive Danish cluster monitoring & evaluation system. As a consequence, we are examining which new meaningful indicators - that can also be easily collected - will be introduced.

A rather new aspect to us that needs further work is the shared value concept that is being strategically promoted in Catalonia. The awareness building and implementation of the United Nations Sustainable Development Goals or the concept of the common good is also gaining in importance in cluster activities in our region - but has so far been a niche activity.

Catalonia

No single recipe for success: Cluster support can be delivered efficiently using different institutional arrangements and leading to equally good results. In Catalonia the political level is in charge of formulating cluster policy while its executive agency (*ACCIÓ*) carries out its implementation. On the other hand, in Denmark the government cluster support is provided through a tendering process and currently *Cluster Excellence Denmark* holds that role. In both cases cluster organisations are independent entities. Yet, in Lower Austria, cluster support is channelled through the Lower Austrian business agency *ecoplus* but the differential feature is that in this case the agency houses the clusters and hence cluster managers are employees of the agency. The three territories have a diverse setup and the three are successful.

Foresight is the new now: Reaching the stage of maturity does not mean for cluster policy to be fixed and immovable. On the contrary, it implies the tricky challenge of taking stock of what has been done in the past but also being able to prepare for and adapt to a fast ever-changing environment, especially nowadays, so as not to become irrelevant. Reflecting on how cluster policy deals with new trends, how the three territories seek to anticipate and lead the way with three specific cases (digital and green transition in Lower Austria, shared value in Catalonia and internationalisation in Denmark) has highlighted the evermore importance of foresight in this policy.

Accountability measures are essential to close the policy cycle, to guarantee transparency and to make the policy move forward. A cluster programme needs to be well designed and smoothly implemented, and so many efforts are deployed in these two tasks that there is the risk of not investing as many in accountability.

Catalonia

On the one hand, monitoring and evaluation frameworks are necessary to make informed decisions on potential changes. On the other hand, evaluation is a difficult task given that cluster policy involves a number of intangible elements and clusters operate in a highly complex environment, among others. Learning the essentials on the Lower Austrian and Danish approaches has broadened the perspective and opened the door to fine-tuning the current system in Catalonia.

Decision making mostly based on objective metrics: Both Lower Austria and Denmark strongly rely on objective data (statistics, quantitative analysis) to make informed decisions related to cluster support.

In the case of Lower Austria, statistics on turnover, employment and other elements are used to carry out an ex-ante mapping of cluster potential to test the relevance of the sector. Also, the data collected within the monitoring framework is applied to determine discontinuation of cluster support, for example, when the *Wellbeing Cluster* showed continuous underperformance in the development of collaborative innovation projects connecting big lead companies and local SMEs.

As per Denmark, classical data analysis to measure business and research strength was the first step in the process of shifting from a one-layer to a multi-layered cluster programme.

The employment of objective metrics in decision-making processes provides a layer of consistency and transparency to the cluster policy and programme. Delving into these particular cases has contributed to enhancing insights for further consideration.

Denmark

The theme of the work has been very inspirational: The Dilemmas of Mature Cluster Programmes. There is no end to working with clusters. It is a journey, and as the cluster policies evolve and the clusters change and grow, new challenges occur that need to be tackled. You cannot get it all. This underlines being very specific about the purpose of the cluster programme (regional development, innovation, very targeted business support) and finding ways of ensuring methods of adapting the cluster policies of the years.

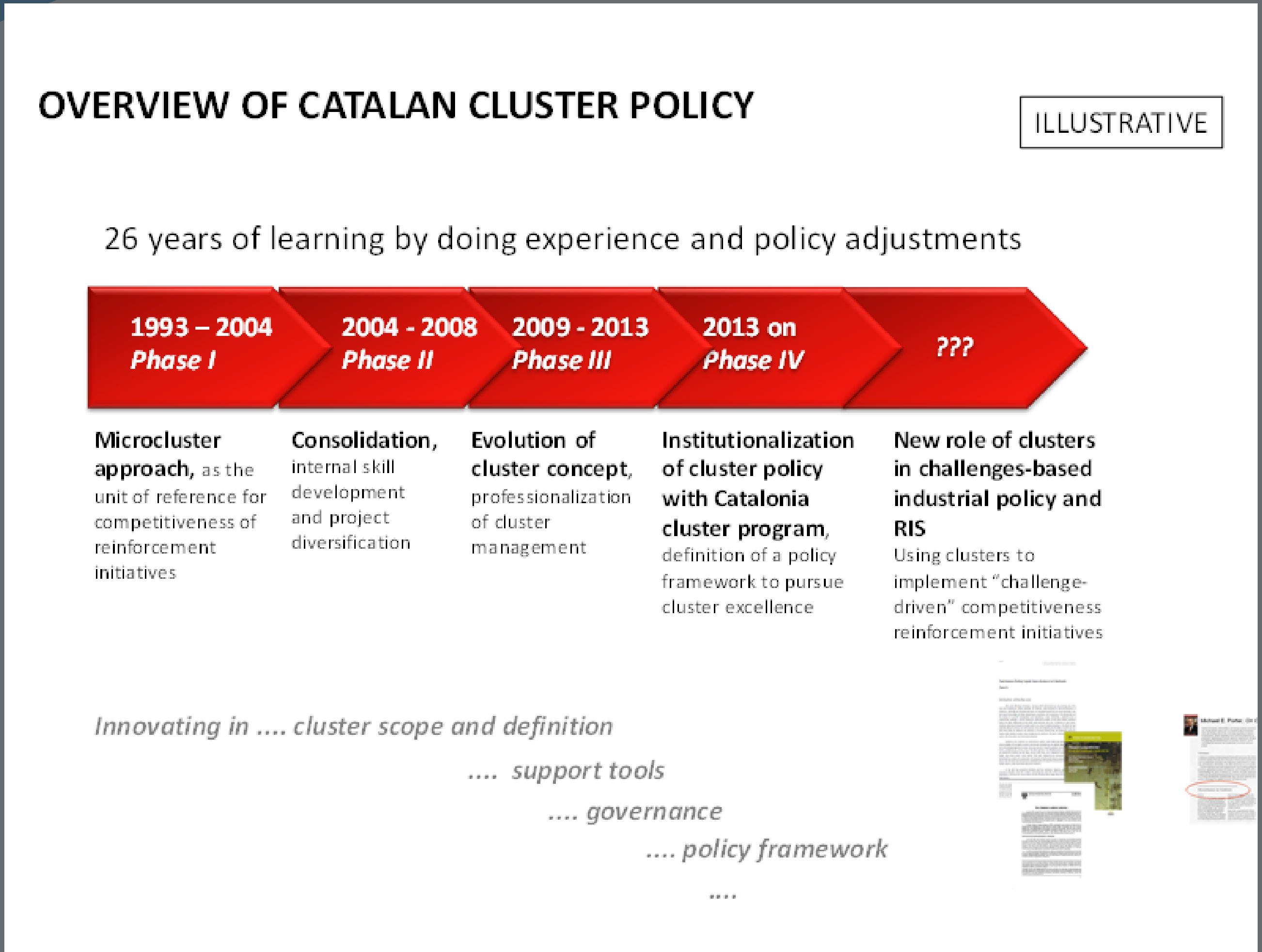
Even mature cluster programmes need some kind of cluster support: The three participating entities have chosen very different ways matching the needs and the opportunities of organising cluster development support in their respective location. Again there is no end to the journey. There are many challenges to tackle when supporting clusters. On this journey it is important to find ways of close dialogue with the clusters like in the Catalan case where the chairmen of the cluster boards have regular meetings with *ACCIÓ* on current challenges. *Cluster Excellence Denmark* is now beginning to define the new needs for cluster support. Here the different approaches of cluster support from *ACCIÓ* and Lower Austria will be integrated in this work of the future cluster support in Denmark.

A very specific learning came from Lower Austria, on mapping the different stakeholders working with internationalisation. This was so inspirational that *Cluster Excellence Denmark* did the same as part of the internationalisation project conducted in the period of the CLIP project. The value of having this kind of basic overview over key players was of huge value to the cluster organisations, and other international stakeholders asked to get the Danish overview. This dialogue also led to a webinar in December 2021 where the different international stakeholders could explain their roles and how they collaborate with the clusters on internationalisation.

Annex

Further information about the three partners

Catalonia Annex 1: Overview of Catalan cluster policy



Source: Pezzi, A. , ACCIÓ-DGI, 2019

Catalonia Annex 2: Requirements for accreditation

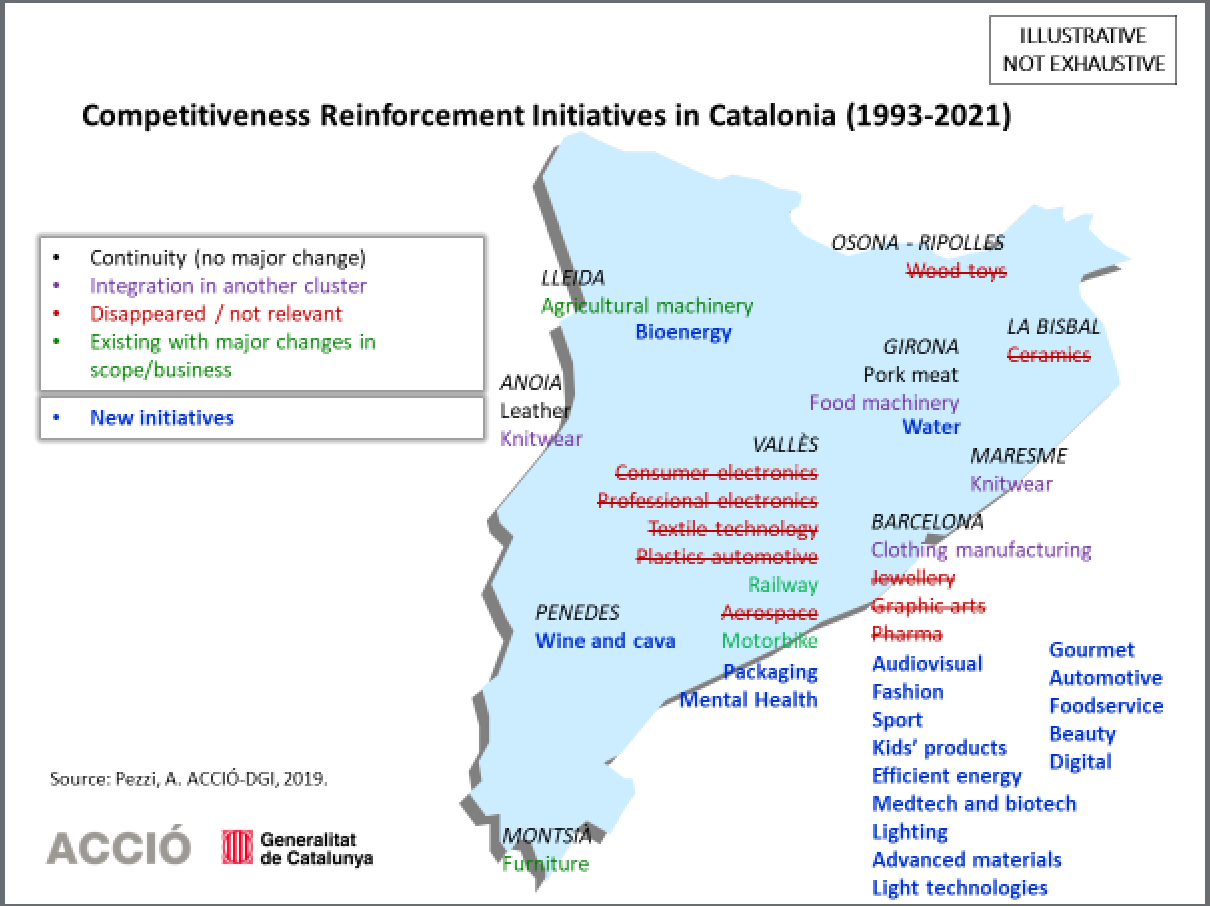
a. To be aligned with the cluster policy of the Generalitat de Catalunya, available on ACCIÓ's website.
b. To have a geographical scope covering, at least and mainly, Catalonia.
c. To have a separate legal personality. To be a not-for-profit entity and have as main corporate purpose the improvement of the competitiveness of companies.
d. To have a management board in which at least 70% of the members are private companies. It shall also have at least one technology or knowledge representative.
e. To have at least 60 members with an operational establishment in Catalonia, benefactors, collaborating entities or related figures having the obligation to contribute financially on a regular and recurring basis to the activity of the cluster. For clusters having been in existence for less than 3 years, counting from the date of registration of their creation in the corresponding register, the figure is reduced to 30 members.
f. To have a minimum aggregate turnover of 200 million euros and a potential critical mass of 500 million euros. For clusters having been in existence for less than 3 years the figure is set at 150 million euros and a potential critical mass of 500 million euros.
g. To possess an up-to-date Bronze Label or higher certification from the European Secretariat for Cluster Analysis (ESCA)
h. To have the services of a full-time cluster manager, who does not carry out activities that involve a conflict of interest with the professional activity as a cluster manager and having Catalonia as place of work. Additionally the cluster manager needs to fit a specific profile.

In addition, for clusters with more than 3 years of existence it is also required to have the services of a project manager, administrative assistant or similar working full time or several professionals adding up to one full time equivalent.

i. To be an independent organisation from other business associations or other existing institutions. (specific conditions to be met)
j. To have a strategic analysis including: Cluster definition and scope, mapping of companies and agents in the cluster indicating the defining value chain and the business segments the cluster covers; quantification of potential critical mass (Indicating companies, turnover and number of employees); international business trends; strategic business challenges and environment challenges in which the cluster operates.
k. To have an annual action plan including: Strategic focus: differential value proposition of the cluster; Prioritized lines of work in the areas of innovation, internationalisation, talent and shared value, among others; Calendar of activities and projects, including inter-cluster activities.
l. The members and related figures shall be representative of the value chain the cluster represents.
m. To contribute with differential value and not to entail overlapping business segments with other clusters. (Exception: clusters in merger process)
n. To have a consistent track record: to be able to prove a minimum of two years of track record as a cluster and submit a portfolio of projects and activities carried out to be assessed in terms of alignment with strategic challenges, impact and business leadership.
o. To be mainly focused on improving business competitiveness and not on representation and lobbying activities.
p. To ensure a robust governance: Having a governing body representative of the cluster's value chain, with diversified participation in this chain, and administrators committed to the organization who are actively involved and contribute to the cluster's development.
q. Not to be in any of the circumstances provided for by Article 13 of the General Subsidies Act 38/2003, of 17th November.

Source: Adapted and translated from http://www.accio.gencat.cat/ca/serveis/processos-acreditacio/clusters/

Catalonia Annex 3: Competitiveness reinforcement initiatives in Catalonia (1993-2021)



Source: Adapted in 2021 from Pezzi, A. , ACCIÓ-DGI, 2019

Catalonia Annex 4: Annex 4: Catalonia Evaluation of Smart Specialisation Strategy

- The research and innovation strategy for the smart specialisation of Catalonia
- Towards a transformative Smart Specialisation Strategy: lessons from Catalonia, Bulgaria and Greece

Annex Denmark

Danmarks Erhvervsfremmebestyrelse (2019): “Erhvervsfremme i Danmark 2020-2023”
https://erhvervsfremmebestyrelsen.dk/sites/default/files/2020-03/Erhvervsfremme-i-Danmark-2020-2023_Strategi.pdf

Uddannelses- og Forskningsministeriet og Danmarks Erhvervsfremmebestyrelse (2020): ”Innovationskraft- Danske klynger for viden og erhverv 2021- 2024”
https://ufm.dk/forskning-og-innovation/tilskud-til-forskning-og-innovation/opslag/2020/Innovationskraft.pdf

IRIS Group for Erhvervsstyrelsen (2019): ”Danske styrker inden for forskning, teknologi og uddannelse – og deres betydning for vækst og erhvervsudvikling”
https://irisgroup.dk/wp-content/uploads/2019/06/Analyse-af-danske-styrker-inden-for-forskning-teknologi-og-uddannelse.pdf

IRIS Group for Erhvervsstyrelsen (2019): "Erhvervsmæssige styrkeområder - kortlægning af erhvervsstyrker i dansk erhvervsliv"
https://irisgroup.dk/wp-content/uploads/2019/06/Erhvervsmæssige-styrkeområder-inkl.-faktaark.pdf

McKinsey & Company, Struensee & Co., DAMVAD Analytics and Landfall Strategy Group (2016): ”Eftersyn af Erhvervsfremmeindsatsen - Eftersyn af innovations-, erhvervs-, investerings- og eksportfremmeindsatsen” https://em.dk/nyhedsarkiv/2016/november/analyse-af-erhvervsfremmesystemet-er-klar/

Fiche – Catalonia

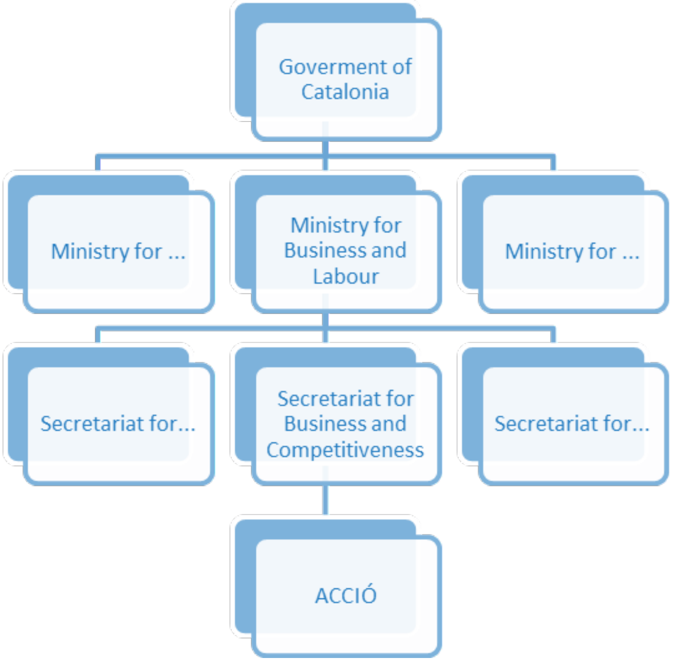
Cluster policy since	1992
Name of the programme	Catalonia Cluster Programme (in Catalan)
Programme owner	Secretariat for Business and Competitiveness, Ministry for Business and Labour, Organigrama. Generalitat de Catalunya (gencat.cat)
Responsible for implementation	ACCIÓ, the Catalan Government's agency for business competitiveness
Programme objectives	• To promote the competitiveness of the Catalan economy through clusters. • To systematise the Government of Catalonia's work on cluster policy. • To help rationalise Catalonia's current cluster portfolio
Budget	Overall funding for competitiveness reinforcement projects, projects of development and innovation and selected actions from the cluster annual action plan: three million euros.
Programme type	It is a voluntary programme open to all clusters that operate at least throughout Catalonia and meet specific criteria.
Targeted clusters	No specific target
Number of clusters supported (year 2022)	25 (as of December 2021)
Duration	Three years (The current programme runs from 2021 to 2024)

Access criteria	Total of 16 criteria grouped as follows: **Formal and object:** - Legally established not-for-profit entity whose aim is to foster the competitiveness of companies, no lobby, independent from other organisations. **Scope and critical mass:** - Minimum of 60 members in Catalonia (30 for clusters <3 years), 200 million euros of aggregate turnover, 500 million euros of potential critical mass - Minimum scope Catalonia. No overlapping with other clusters. Value chain representativeness. **Strategy and Governance:** **-** Strategic analysis and Annual action plan - Executive Board made up of 70% private companies, minimum one environment actor and a robust governance. - Consistent track-record **Professionalisation:** **-** One cluster manager (located in Catalonia) and one additional FTE - ESCA Bronze Label or higher **Alignment with cluster policy of the Government of Catalonia.**
Type of support	**Specialised services** offered by ACCIÓ: • Strategic guidance • Advice on governance • Networking • Specialised training • The implementation of intercluster dynamics • International benchmarking • Advice on European programmes for clusters • Access to specialised infrastructures such as the Catalonia Clusters Hub • Promotion of new trends (Shared value) **Financial support**

Fiche – Catalonia

Amount allocated	The funding scheme is competitive based. In 2021 68 projects were awarded of an average amount of 40.000 euros.
Monitoring system	Not available
Evaluation framework	Cluster evaluation framework at two levels: - Survey to cluster members: every two years - Survey to cluster management team: - Cluster managers: annually - Project managers: new since 2021 annually

Organisation chart:



Fiche - Denmark

Cluster policy since	First program starting in 2003 (regional growth networks)
Name of the programme	Innovation Power https://ufm.dk/forskning-og-innovation/tilskud-til-forskning-og-innovation/opslag/2020/opslag-til-klyngeprogrammet-innovationskraft-danske-klynger-for-viden-og-erhverv-2021-2024
Programme owner	Danish Ministry of Higher Education and Science & Ministry of Industry/Business Development Board
Responsible for implementation	Danish Ministry of Higher Education and Science & Ministry of Industry/Business Development Board with support from Cluster Excellence Denmark
Programme objectives	• Strengthening the innovation power in Danish companies within the strongest and most promising of business and technology areas • Collaboration and knowledge transfer is key areas to secure the innovation • Secure world class innovation • All cluster organisation also need to focus on green and digital transition
Budget	86 mill. EUR for a 4 year period
Programme type	Open competition in relation to the Danish Smart Specialisation Strategy
Targeted clusters	Cluster organisations in relation to the 10 strongholds and 2-4 emerging areas could be funding

Number of clusters supported (year 2021)	10 stronghold clusters and 4 emerging clusters
Duration	4 years - for the funding coming from Ministry of Industry the clusters need to re-apply after 2 years
Access criteria	For full scheme of access criteria look here https://ufm.dk/forskning-og-innovation/tilskud-til-forskning-og-innovation/opslag/2020/opslag-til-klyngeprogrammet-innovationskraft-danske-klynger-for-viden-og-erhverv-2021-2024
Type of support	Cluster Excellence Denmark support the clusters on professionalisation, competence development and internationalisation https://clusterexcellencedenmark.dk/?lang=en
Amount allocated	Financial support depends on the size of the clusters and the activities with a range of 1.3-2 mill EUR per year. The clusters normally have a wide range of external funding
Monitoring system	A new evaluation system is currently being implemented building on previous indicators and methods while adapted to new online needs.
Evaluation framework	An overview over the previous evaluations can be found here https://clusterexcellencedenmark.dk/knowledgebank/?lang=en. Here there is a mixture of self evaluation from the clusters, evaluations of company outcomes and external research and consulting reports documenting the value of clusters.

Fiche – Lower Austria

Cluster policy since	2001
Name of the programme	Cluster Programme Lower Austria
Programme owner	Office of the Regional Government of Lower Austria, Department Economy, Tourism & Sports
Responsible for implementation	ecoplus. The Business Agency of Lower Austria
Programme objectives	• Fostering R&D&I through cooperation in the Lower Austrian companies. • Mobilisation and introduction to innovation and cooperation, • Promoting lead projects with regional value-added relevance and regional smart specialisation. • Bundling available competences in the region and beyond • Facilitating a dialogue between companies, R&D and qualification institutions and the policy makers: "translating" the needs of the regional economy both to politics/administration and training and R&D institutions, and vice versa the economic policy initiatives and instruments into the economy.
Budget	n.a.
Programme type	Multiannual programme, biannual performance monitoring, mechanisms to stop/launch clusters during programme duration
Targeted clusters	All
Number of clusters supported (year 2021)	4

Duration	7 years
Access criteria	Ex-ante mapping of cluster potential by external experts: • Relevance of sector (statistics: turnover, jobs, etc) • Cooperation and development potential (interviews & workshops with companies etc.) The results of the mapping are the basis for the programme owner's decision to start a new cluster initiative or not.
Type of support	Financial support for cluster management (staff, overheads, other costs, external expertise (studies, etc.)
Amount allocated	Annual budgets per cluster, annual financial reporting
Monitoring system	Indicators: • nr. of lead projects initiated (R&D, multiannual, relevance for regional economy, involving SMEs and large enterprises/midcaps) • nr. of lead companies involved in collaborative projects • nr. of projects on product/service system innovation initiated • nr. of qualification projects initiated • cooperation rate (ratio of cluster members involved in collaborative projects)
Evaluation framework	at regional (not cluster) level: • Large scale satifaction survey among companies • Regional Innovation Index • Regional extension of CIS Cummunity Innovation Survey • etc.

Fiche – Lower Austria

Organisation chart:

ecoplus. The Business Agency of Lower Austria

100% owned by the Region of Lower Austria