EUROPEAN CLUSTER COLLABORATION PLATFORM

Cluster business models fit for accelerating the twin transitions

Key actions for clusters to implement transition pathways

ECCP Discussion Paper

An initiative of the European Union

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ECCP Discussion Papers

The European Cluster Collaboration Platform (ECCP) is the main hub facilitating cluster cooperation within the EU and beyond. It is supported by the European Commission through the COSME programme.

This Discussion Paper was submitted to the European Expert Group on Clusters as an input for their discussions. The European Expert Group on Clusters provides the Commission, EU countries and regions with recommendations, advice, and expertise, specifically on how to better use clusters as a strategic tool of industrial policy, interregional collaboration and to integrate SMEs into EU and global value chains. The members of the group are the EU countries and individual experts appointed in a personal capacity (selected via a call for applications).

Introduction

Europe has been leading the way to a climate-neutral society by setting targets to achieve in 2050 an economy with net-zero greenhouse gas emissions. The European Green Deal provides the overall strategy to support a competitive and decarbonised economy where economic growth is decoupled from resource use.

On this journey, the digital transformation is a key enabler of innovation to support decarbonisation of industrial sectors. By recognizing the closely intertwined relation between the digital and green transitions, the Commission's revised industrial strategy aims at strengthening EU autonomy in key industrial ecosystems.

In this context, where cooperation is key to success, it is important that cluster business models are fit for purpose to support SMEs in identifying, developing and implementing their transition pathways. Clusters will be instrumental to support the identification of actions needed to achieve the twin transitions, the development of tailored action plans for competitive and sustainable industrial ecosystems and the implementation of these plans at systems and company level.

As a result, understanding cluster business models to make them fit to support the twin transitions will improve competitiveness and enhance sustainability. The objective of this input paper is to steer the discussion on the role of cluster business models in implementing transition pathways.

In particular:

- What are the key transition pathways required for the twin transitions?
- What are the different cluster business models and how are they evolving?
- What is needed to enable clusters to develop business models that support the transition pathways?

What are the key transition pathways required for the twin transitions?

Definition of transition pathways

Transition pathways can be defined as *actions and strategies encompassing socio-economic and regulatory changes needed to generate a transition and achieve a long-term vision*. Transition pathways design policy change as an *innovation process* that is based on stakeholder involvement, trial and error to find out which initiatives work, and learning lessons from these trials to adapt, replicate, and scale-up as appropriate.

The pathway approach has been adopted to respond proactively to complex problems, such as climate change, and to enable effective policy making. It has been used successfully in the field of sustainability, for instance by linking top-down and bottom-up actions that lower greenhouse emissions, reduce impacts of and vulnerabilities to climate change and enhance well-being. Transition pathways approaches are common in sustainable development , especially in developing countries (e.g. food system transition projects in Ghana, Bangladesh, Uganda and Indonesia)[1]. Closer to home, a transition pathway approach was also applied to the Finnish energy transition by 2030[2] and to sustainable transport experiments across Europe[3]

Approaches to developing transition pathways

The main theoretical frameworks conceptualising transition pathway approaches are the multi-level perspective and transition management.

The **multi-level perspective** focuses on the interplay of three layers that need to come together to make the transition happen:

- the niche level (where innovation with radical technologies occurs), for example, in new energy generation innovations developed by private sector or public sector actors, or social innovation initiatives, such as renewable energy communities;
- the regime level (representing the status quo of the current system), namely the conventional approach to energy production); and
- the landscape level (encompassing the wider context of socio-economic and regulatory trends), which could include e.g. climate change, demographic developments, economic crises, etc.

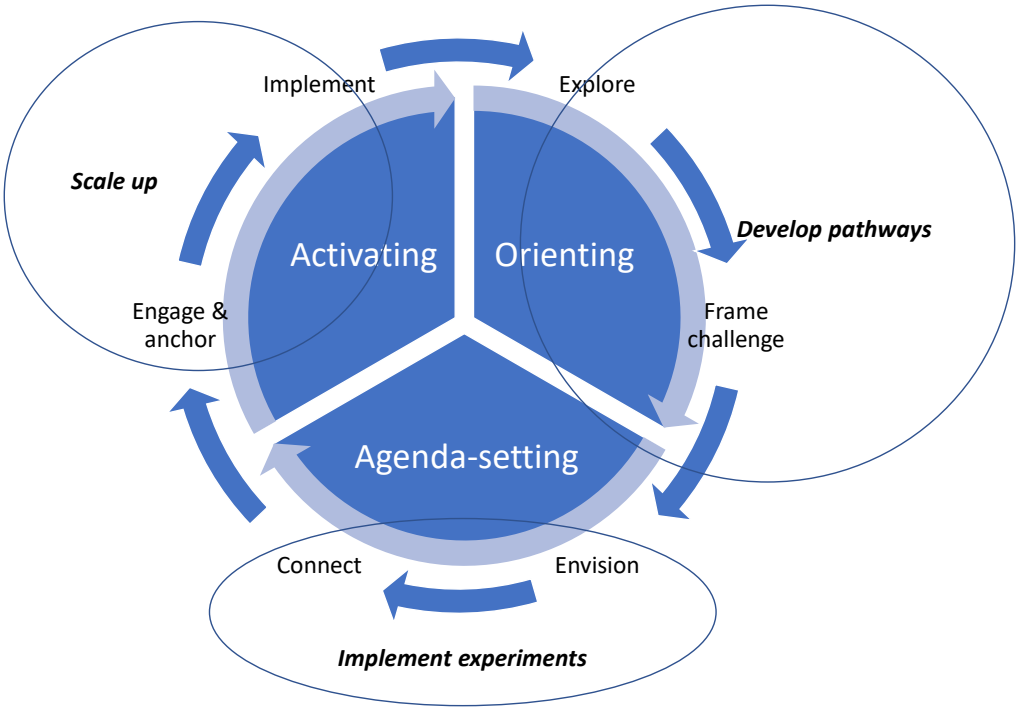
The **transition management framework** emphasises the governance of the transition, namely the way stakeholders come together to steer the system in a new direction (e.g. sustainability, digital) by defining transition management cycles. This is done through the following steps:

- Setting up the **transition arena** (a network where stakeholder come together to define current challenges and define long-term vision);
- Narrowing down the vision into more concrete **transition paths**;
- Implementing **transition experiments** that aim at exploring the transition path;
- **Anchoring, evaluating and monitoring** the results among stakeholders; and
- **Scaling up** the experiments to deliver the twin transitions.

[1] For more information: https://edepot.wur.nl/543030
[2] For more information: https://www.mdpi.com/2071-1050/11/3/603
[3] See a number of examples here: https://library.oapen.org/handle/20.500.12657/24252

The figure below presents a transition management framework that could be adapted for each of the industrial ecosystems. What is common to all transition management approaches is that they need to be embedded in the policy-making process, bring together a wide range of stakeholders and aim at mid- to long- term planning. It is worth mentioning that transition processes are non-linear and develop at varying pace. This also means that transitions encompass feedback loops/double loop learning, namely changing methods and improving efficiency to obtain the objectives or changing the objectives themselves by questioning the assumptions underlying those objectives. With their emphasis on piloting and experiments, transition management approaches are designed to allow for such flexibility.

Figure 1: Using a transition arena to develop transition pathways, implement and scale-up transition experiments



Transition pathways and change

Because they combine a multi-level perspective with a transition management framework, pathway approaches lend themselves to **systemic change**. Indeed, the Commission's communication on "Updating the 2020 new industrial strategy: Building a stronger Single Market for Europe Recovery" [4]identifies the transformation potential at the level of 14 industrial ecosystems in Europe (i.e Tourism, Mobility-Transport-Automotive, Aerospace & Defence, Construction, Agri-food, Energy Intensive Industries, Textile, Creative & Cultural Industries, Digital, Renewable Energy, Electronics, Retail, Proximity & Social Economy, and Health). The need for systemic approaches is further emphasised in "Clusters of Change"[5], an initiative that looks at the potential of clusters to facilitate change at systems level.

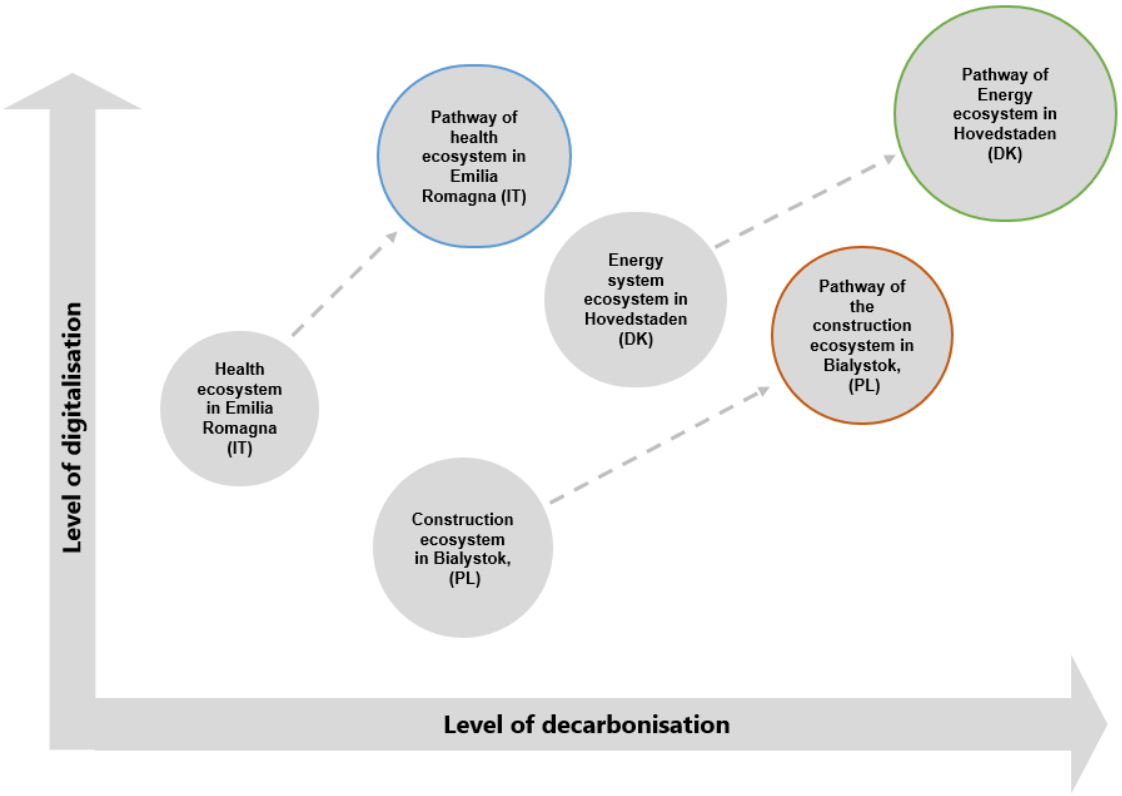
Of course, systemic change does not mean a one-size-fits-all approach to the twin transitions. Indeed, the multi-level perspective emphasises that change (innovation) occurs at local level, but it is influenced by the status quo (the regime)

[4] European Commission, 2021, Communication on Updating the 2020 New Industrial Strategy: Building a stronger Single Market for Europe's recovery, COM(2021)350 final
[5] Available at: https://clustersofchange.eu/

and the wider context (trends) in which it takes place. For instance, successful transitions could be achieved through a different balance in the ambition to decarbonise / digitise depending on the ecosystem and place-based characteristics.

What is needed therefore are "place-based strategies" that pursue incremental change toward decarbonisation and digitisation based on the needs and potential of local industry. Successful transition pathways will vary over time and across eco-systems and geographies. The figure below visually represents the idea behind a place-based approach to transition pathways. An analysis on the different regional ecosystems in terms of digitalisation and decarbonisation could be done to understand the current state of play and to define priorities. This would then lead to the development of tailored action plans to progress toward the twin transition. In this context, a variety of factors including readiness of the ecosystem to adapt to change, the pace of innovation, stakeholder engagement will influence the speed and the direction of the vectors. For instance, transitions might speed up if learning processes have been stabilised, powerful actors have joined the support network, market prospects are positive or if the innovation is used in market niches already (commercial testing). When it comes to innovation reshaping and creating new value chains, breakthrough innovation plays a key role and – though not required in the context of all transition pathways, this can drive developments forward significantly. -

Figure 2: Example of tailored pathways



However, the potential of **twin pathways**, combining the green and digital transitions, has not yet been fully explored in literature or practice. At European level, the Industrial Forum, set up as part of the new industrial strategy for Europe, has been supporting the European Commission in developing an assessment of the needs and risks of industry embarking on the twin digital and green transitions with a focus on the 14 ecosystems. The Forum also aims to develop transition pathways for these eco-systems and, in particular, a better bottom-up understanding of the scale, costs, long-term benefits and conditions of the required actions to be undertaken. Furthermore two ecosystem pathways have been published by

the European Commission: on tourism[6] and energy intensive pathways[7] and work is continuing on the development of pathways for other ecosystems.

Clusters and transition pathways

Within the Forum's work, a multilevel approach to transition management including the European Cluster Collaboration Platform could be developed. The novelty of the approach consists in using theoretical framework of transition pathways and linking them to cluster activities and place-based characteristics, such as economic, socio-demographic, environmental, regulatory and political features of ecosystems to facilitate the twin transitions.

For instance, the European Cluster Collaboration Platform could play a crucial role in the **mobilisation of the transition arena.** The aim of this work would be to:

- Engage with all stakeholders in a systematic way to narrow down the overall vision (the twin transitions) into more concrete transition pathways for each ecosystem;
- Frame the challenges at the level of each eco-system and the corresponding action plans;
- Map, connect and mobilise relevant stakeholders across Europe to deliver on these actions in transition experiments that are specific to different places;
- Ensure learning and knowledge sharing from the transition experiments, in each configuration of eco-system and place, and across eco-systems; and

Connect objectives with existing initiatives, such as smart specialisation platform, including the Entrepreneurial Discovery Process (EDP)[8], and Smart specialisation strategies for sustainability (S4)[9].
Based on these action plans, the ECCP could then **support transition experiments** (pilot actions) which engage clusters operating in different ecosystems around Europe and bring together industry (in the form of clusters and companies), academia/research, civil society and policymakers to design, implement, assess and share knowledge, and ultimately scale up the on-field experiments. Such an approach would build on the conclusions of previous research at EU level (e.g. "Study on monitoring progress in national initiatives on digitising industry") which has found that one of the main success factors for digitizing industry are instruments for networking and knowledge transfer (Clusters/DIH).

Of course, this work can build on knowledge that has already been developed when it comes to the twin transitions. Below a few of these lessons that could feed into the set-up of transition arenas are presented:

Digitalisation

- Digitalisation strategies / pathways are most effective when they are specific and comprehensive, updated regularly, coherent with other strategies and when they include stakeholders in the development process.
- A pivotal role is also played by a regulatory framework which favours innovation (including data management and security regulation) and allows enough flexibility to include new technologies with clearly defined responsibilities.
- Long term strategies / pathways are needed to significantly improve digital skills. Especially training of the workforce and entrepreneurs as well as research and higher education in STEM subjects have proven effective.

Finally, and of high relevance given the context of the RRF, funding volumes have to be increased but additional resources have to be spent effectively.

Decarbonisation

[6] European Commission Staff Working Document, 2021, Scenarios towards co-creation of transition pathway for tourism for a more resilient, innovative and sustainable ecosystem. SWD(2021) 164 final.
[7] European Commission Staff Working Document, 2021, for a resilient, innovative, sustainable and digital energy-intensive industries ecosystem: Scenarios for a transition pathways, SWD(2021)277 final.
[8] https://s3platform.jrc.ec.europa.eu/edp
[9] https://s3platform.jrc.ec.europa.eu/s4

- Successful examples of decarbonisation policies have as a common feature the inclusion and active participation of a wide range of stakeholders affected by those policies, ranging from the industry, think tank, academia, investors, etc. The participatory element in the formulation of strategies is a proven enabling factor.
- R&I is needed both on the technology side (at all timescales and looking at all the different technologies) and on the management side (connecting the different energy markets and infrastructures, putting in place robust regulation and policies, setting the ground for new business models).
- Successful decarbonisation pathways for ecosystems are defined according to the sector specificities. As an example, successful decarbonisation strategies for the steel sector involves improved energy and materials efficiency, increased focus on circularity and new technologies. While for the plastic industry it focuses on reducing or optimising use and production, increased circularity and making use of chemical recycling
- Another enabling factor of successful industry decarbonisation is the definition of an overarching and clear direction by policy makers based on assessment of market pull, governance capacity and evaluation in terms of competitiveness and trade.

What are the different cluster business models?

Clusters have been increasingly acknowledged as pivotal for the recovery because they are a tool to support industrial innovation, internationalisation, and supply chain resilience. As highlighted in the Commission Communication an "SME Strategy for sustainable and digital Europe", strategic dependencies can have a particular impact on SMEs, and clusters can offer their members a way to address disruptions and vulnerabilities by connecting them to other local and cross-border partners.

Indeed, there is evidence of considerable value in clusters: in Europe there are currently 2950 clusters, accounting for 61.8 million jobs[10]. Moreover, the productivity of companies that are part of clusters is 25% higher than average productivity (see 2020 European Cluster Panorama report). At the same time, a large majority of these clusters are small and under-resourced which, in turn, limits their impact.

While we have a good understanding of how clusters can generate wider societal and economic impacts (e.g. from a long-standing set of academic research in economic geography), less is known about how they work internally to generate value, how they can monetise this value and what implications different monetisation models have.

Types of clusters

In "Cluster Business Models - Exploring Business Models in Global Innovation Clusters"[11] Christian Rangen *et al* develop a typology of clusters based on their mission and their funding models. The table below adds the work of the European Observatory for Clusters and Industrial Change[12] to the categories produced by Rangen et al. to provide a complete overview of the different types of clusters – the classifications in this table are not mutually exclusive, but they emphasise different aspects of clusters.

Figure 3: Different ways of classifying clusters (value added, function, maturity and aims)

Value added (Rangen)	Function (EOCIC)	Maturity (Rangen)	Aim (Rangen)
Trust-based collaboration platforms	Intelligence (market research, knowledge transfer, consultancy and project management services)	Emerging Cluster	Grow an existing industry
Private-public partnerships, developed by design	Collaboration (networking, linking new value chains)	Growth Cluster	Transform an existing industry
Magnets that attract talent, capital, researchers, and companies	Business support (incubation and acceleration, central services, internationalisation support, market access services)	Supercluster	Build a new industry
Collaboration networks built around the industries of the future			
Solving industry-level challenges and opportunities			
Economic Engine by connecting members and partners			

Source: Adapted from Rangen et al, Cluster Business Models - Exploring Business Models in Global Innovation Clusters

Finance, costs and value: the cluster business model

What all these different types of clusters have in common is that they must monetise their value or services to ensure their financial sustainability. As Rangen et al. point out, when it comes to finances, three variables need to be considered in the cluster business model[13]:

[10] European Commission, 2020, European Panorama of Cluster and Industrial Change.
[11] Rangen, et al. 2021, Cluster Business Models, Exploring Business models in Global Innovation clusters,
[12] European Commission, 2020, European Panorama of Cluster and Industrial Change.
[13] Rangen, et al. 2021, Cluster Business Models, Exploring Business models in Global Innovation clusters

- The funding structure (public, private, project or a mix of these):
  - Private funding will come mostly from membership fees and services provided by the cluster to its members and to others;
  - Project funding can be drawn from cluster involvement in (publicly or privately) funded projects and
  - Public funding typically comes from structural funds, European funds, central government or local / regional subsidies.

  While most clusters start off with short term public funding, as they grow a long-term financial plan needs to be developed to attract funding from a mix of sources. While many clusters do have a public mission and generate significant externalities that justify continued public support, economic sustainability in the end requires private funding sources (e.g. membership fees) that are not tied to specific projects, but directly deliver value to cluster members. Indeed, according to a survey conducted in 2016, in Europe the main source of financing for clusters came from membership fees (38%), followed by funded projects (29%), and finally institutional funding (13%)[14]. On the whole, the funding structure and the need to identify funding sources can be a major activity of the cluster, with the risk of distracting from the focus on the cluster's value added.

- **The cost structure of a cluster** (which relates to the activities of the cluster, the impact it wants to have and the way in which costs are managed). Here elements such as legal form, the need for and size of the board, the identification and management of fixed and variable costs, relations with banks and financial modelling of cluster activities come in.

- **The value proposition of a cluster**: a key value of clusters is that they can act with a longer-term time horizon to enable businesses to make strategic choices about the direction that they want to take. This can be to create a new industry, grow an existing one or facilitate a strategic transformation (such as the twin transitions). Clusters are the ecosystems where companies can create a shared value that strengthens business identities, implements a sense of network membership, and increases their competitiveness. Shared value creation through clusters could play a pivotal role in engagement of local communities in green transition and resilience. Clusters do this through the provision of intelligence, collaboration opportunities and business support actions. For instance, the value proposition of clusters could lie in:
  - Facilitating the green transition by developing and implementing circular economy strategies and action plans, developing capacity buildings programmes, or acting as intermediaries between business, science, policy, capital and entrepreneurs to support the transition. Examples include SME Initiative Energy Transition and Climate Protection (Germany), Waste4think, Catalan Water Partnership (Spain);
  - Facilitating the digital transition by upskilling, providing advance business services, being integral parts of Digital Innovation Hubs, reinforcing Public-Private Partnerships. Examples include AS-Fabrik Alliance (Spain), Living Labs (Belgium), AI 4.0 Programme (Finland), Smart Growth Operational Programme (Poland);
  - Enhancing resilience by making value/supply chains more resilient, actively participating into labour markets, initiating cross-sectoral, interdisciplinary and transnational collaboration. Examples include National clusters platform (Austria), Support Programme Cooperation (Czech Republic), Aviation cluster (Hamburg), Competitiveness Clusters (Portugal), Support industrial clusters (Slovakia).

Business model challenges

As the discussion above has shown, cluster business models are a function of the type of cluster (aim, maturity, functions and value added), the sources of funding, the costs of the cluster and its value proposition. There are 3 main challenges that are worth noting in connection with these cluster business models:

- **The value of clusters lies in the long term but often the funding needs and sources are short-term or are time-limited**. There is therefore a delicate balancing act for clusters to strike in terms of their funding mix, the

[14] In the same survey, intelligence services (knowledge transfer, advisory services) represented 34% of cluster services, cooperation and business support accounted respectively for 28% and 21% of the services provided

focus of their activities and their wide strategic mission. Generally, the more flexible the cost structure of the cluster, the easier it is to attract sufficient funding and adapt activities to reflect the needs of members.

- **Clusters can generate significant externalities** with benefits that are distributed unequally across different stakeholder groups including members of the cluster, non-members and the wider economy, while costs tend to be concentrated on members. There is therefore a justification for public intervention to capture these externalities and there is a rationale for clusters to monetise their value proposition to other stakeholders (outside the cluster membership).

- While clusters have the potential to lead the systemic transformation that is require for the twin transition, **they are often too small, too local and too focused on the short term** to achieve systemic change.

As the next chapter shows, the ECCP which brings together the European cluster community could play a pivotal role in supporting clusters to operate at a more strategic level, providing capacity building for cluster managers and allowing them to pool their resources to increase efficiency and maximise impact.

What is needed to enable clusters to develop business models that support the transition pathways

As discussed in the previous sections, clusters have the potential to become pivotal change agents in the digital and carbon-neutral transitions. To do this, a shift towards more **mission-oriented clusters** that aim to create **systemic change** over the medium to long term is of outmost importance to ensure that they can effectively contribute to the twin transitions. Shared value creation through clusters could play a pivotal role in engagement of local communities in green transition and resilience. Cluster need to move beyond service provision and take a much more strategic role in their regional economies, and through linking with others in the European economy.

Over the last decades, different clusters business models have emerged in response to the needs of industrial ecosystems, places and stakeholders. To enable the twin transitions, it is crucial to match the key features of cluster business models and the needs of the clusters that operate these models with the actions required to develop and implement transition pathways. It is key to identify cluster business models (and associated funding models) that go beyond service provision and enable this more strategic role

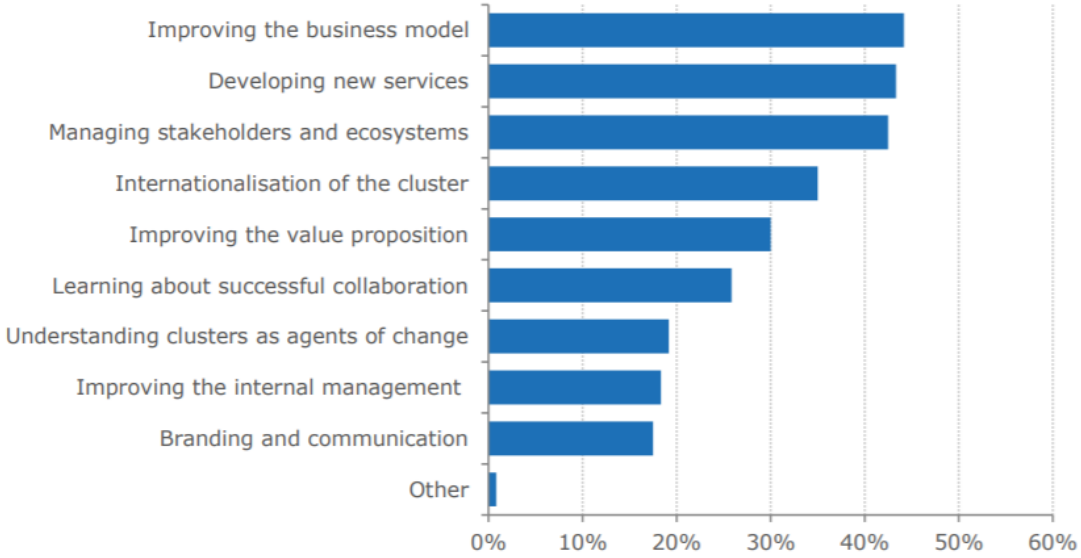
Cluster needs

As highlighted in the second section of this paper, for many clusters the quest for financing can take a significant part of their energy, preventing them from focusing on long term value creation. Because they are resource-challenged, clusters can lose their focus on the long term and their flexibility in adapting their services to the medium to long term needs of businesses (including facilitation of the twin transitions).

Beyond long term finance, previous research including by the ECCP has identified the key development needs of clusters[15]. More than 40% of clusters consider that they need to build their capacity to improve their business model, develop new services and manage stakeholders and ecosystems. All of these points link closely with the points made in the previous section including the need to find resources and funding so as to avoid having to focus on short-term approaches.

[15] European Cluster Collaboration Platform, 2021, Assessment of European Cluster Capacity Building needs.

Figure 4: Needs of cluster organisations



Source: European Cluster Collaboration Platform, Assessment of European Cluster Capacity Building needs,2021

Supporting clusters

As the research has shown, to enable clusters to play a role in fostering the twin transitions at a systemic level they need support in the following key areas:

- **Financial sustainability:** improving their short- and long-term funding structure to enable them to focus on their mission;
- **Resources and services**: supporting clusters in tailoring and aligning their services to the overall regional, national and European objectives / needs in view of the twin transitions;
- **Skills**: training cluster managers to mobilise their managerial / entrepreneurial skills to deliver a transition management approach;
- **Inter-cluster linkages** and investment: supporting cluster to link their vision to the wider ecosystem / value chains, within and across geographies.
- **Mission orientation** of clusters**:** developing a good understanding of the value added of cluster organisations as place-based vehicles of systemic change toward the twin transitions.
- **Evaluation**: demonstrating the impact that clusters have on systemic transitions over time, and how this benefits members.

There is already a wealth of policy and cluster initiatives to tackle some of these needs across Europe. These should be identified and understood so that they can be leveraged for the wider cluster community. Clearly the ECCP with its cluster panorama, factsheets and policy toolkit can contribute to overcoming some of these obstacles.

Figure 5: Cluster needs, key actions and best practices

	Financial sustainability	*Resources and services*	*Skills of clusters*	*Inter-cluster linkages*	*Mission oriented*
Objectives	Improving short and long term funding structures to enable clusters to focus on their mission	Supporting clusters in tailoring and aligning their services to regional, national and European objectives to enable the twin transitions	Training cluster managers to mobilise their managerial / entrepreneurial skills to deliver a transition management approach	Supporting clusters to link their vision to the wider approach within and between ecosystems / value chains and within and across geographies.	Developing a good understanding of the value added of cluster organisations as place based vehicles of systemic change toward the twin transitions
Actions	• Provide intelligence on necessary components of new value chains • Provide training on business model development and fund raising	• Increase cluster capacity to provide advanced business services • Work with clusters to upgrade their business service provision in the field of adoption of digitalisation. • Mobilise clusters to provide tailored services that connect regional companies to international best practices that support their ongoing learning and adaptability • Reinforcing technology clusters and their links to other clusters	• Mobilise clusters to develop digital skills training services that respond to the needs of their members, in collaboration with local/international universities/VET centres • Support clusters to organise and/or collaborate around training services to reskill or upskill their members for the green and digital transition • Improve Cluster Dynamics (facilitate the diffusion of technology, technology transfer, and access to specialised expertise)	• Leverage clusters to promote collaborative research projects or make collaborative investments in innovation infrastructure and integrate cluster activities with Digital Innovation Hubs • Mobilise clusters as a focal point for bringing together firms to strengthen regional and inter-regional value chains and/or to reenforce public-private partnerships (PPP) • Initiate cross-sectoral, interdisciplinary and transnational cluster collaboration	• Creating a tool-box for clusters to better identified their value added (mission) and link it to challenges face by ecosystem, and possible outcomes. • Build capacity among clusters to play a guiding role in green innovation for SMEs by awareness-raising and providing R&D services that normally only large companies would be able to afford.
Best practices	• Industrial Complex Cluster Program (Korea) • Clusters of Change (Europe)	• AI 4.0 Programme (Finland) • Transylvania DIH (Romania) • SFI Research Centres (Ireland) • Made in Denmark • Support Programme Cooperation – Clusters (Czech Republic) • IoT for Industry	• SME Initiative Energy Transition and Climate Protection (Germany) • Circular Economy Project Management System (France) • Catalan Water Partnership (Spain) • DIHUB Cloud (Belgium)	• Innovation clusters Saxony (Germany) • Danish strategy for circular economy • Waste4think • VIDA INNOSUP Project • Galatea • European Alliance Against Coronavirus • Example: Competitiveness Clusters (Portugal) • Example: NF4 ESCP4i project	• Circular Economy Project Management System (France) • Catalisti spearhead cluster (Flanders)

Conclusions and next steps

The ongoing work of the European Commission on the definition of transition pathways for ecosystems is an opportunity to support clusters in adopting business models that allow for a wide-spread adoption of transition management approaches.

Indeed, building on their existing services, clusters can:

- provide in-depth knowledge of industrial ecosystems across the EU,
- be instrumental in the creation of transition arenas that bring together stakeholders in constructive collaboration toward change, and
- deliver the local and regional business support services that will be key to a successful transition.

To support this, the ECCP could be the bridge between policymakers and clusters at European level including through

- provide continuous update on technology and market development
- implementing the EU strategic direction,,
- enabling knowledge transfer from different transition pilots , learning across ecosystems and geographies, and
- supporting the scale-up of successful initiatives.
- inspire new initiatives

The table below shows how the above steps in developing and implementing transition pathways can be linked to cluster business models.

Figure 6: Matching cluster business models with transition pathways

Step in the transition pathway	Business model aspects (function and funding)	Description of the activity	Value added (Rangen)
Priority definition	Functions: Intelligence and collaboration Funding: mostly long term public funding	Clusters could support policy makers and industry in the definition of digitisation and decarbonisation priorities by providing insights on the current state of play of industrial ecosystems. The key dimensions that should be taken into consideration when developing pathways for ecosystems are the degree of sustainability (decarbonisation ambition) and the degree of digitalisation (digitalisation ambition)	Trust-based collaboration platforms Collaboration networks built around the industries of the future
Identification of strategic challenges	Functions: Intelligence and collaboration Funding: mostly long term public funding; some membership funding for collaborative activities to identify eco-system specific challenges	Cluster support could focus on the key enablers and barriers to digitalisation and decarbonisation of the industry, namely economic, socio-demographic, environmental, regulatory and political features of ecosystems.	Solving industry-level challenges and opportunities Trust-based collaboration platforms Collaboration networks built around the industries of the future Economic Engine by connecting members and partners

Development of tailored actions	Function: business support Funding: project-based, with a mix of public and private sources, including from outside the cluster membership itself	Clusters could play a relevant role in identifying the feasibility (in the short-, mid-, long- term) of targets based on the specificities of each ecosystem and the characteristics of value chains in their geographical area. This insight could then be used to design and implement transition experiments with the support of the cluster	Private-public partnerships, developed by design Magnets that attract talent, capital, researchers, and companies
Support in the design of twin transition pathways	Functions: Collaboration and business support Sources: mix of public and private with an emphasis on private sector funding	Based on steps above, clusters can support the transition from on-field experiments, help assess what work, find replication and scale up opportunities and link transition experiments with the overall digitisation and decarbonisation pathways.	Private-public partnerships, developed by design Magnets that attract talent, capital, researchers, and companies Economic Engine by connecting members and partners

Questions for discussion

- Is the transition pathway approach clearly described?
- Do you have examples of such an approach in practice?
- Do you feel this approach could lead to systemic change? Why / why not?
- What is needed to make a transition management framework successful?
- What could be the role of clusters in developing transition pathways, designing experiments and learning lessons / scaling up?
- What is the role of place-based characteristics (economic, socio-demographic, environmental, regulatory/legal, political…) in transition pathways and how can these be taken into account?
- Do you see a role for clusters? the ECCP? in the development of a transition management framework? How does this link to ongoing initiatives across Europe?
- Where do you see the drivers and obstacles to the successful deployment of a transition management approach in Europe?
- How to get clusters (cluster organisations, their members and non-formalised clusters) actively involved in diagnostics and problem-solving of value chain shortages and long-term vulnerabilities in ecosystems?
- How best ensuring through ECCP the smooth flow of information on technology, investments, competitiveness (market share, trade options etc.), R&I (including prototyping, pilots, demonstrators), capacity and skills, infrastructure, effective governance models and civil society engagement?