"Clusters Driving the Green and Digital transitions"

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Input paper: Leveraging clusters for a green, digital and resilient EU economy – Policy Toolkit

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Introduction

*The objective of the **Policy Toolkit for Leveraging clusters for a green, digital and resilient EU economy** is to support cluster actors to strenghten the role of clusters in the twin transitions and to foster resilience. The **'Cluster driving the Green and Digital transitions'** is a key event to discuss the content of the toolkit and further operationalise the operationalise the [European Cluster Expert Group](#) recommendations to leverage clusters for a greener, digital and more resilient EU economy that were included in their [Recommendation Report](#) adopted in December 2020.[1] The Policy Toolkit has been turned into a web-tool which will be made available on the ECCP website*

The COVID-19 pandemic has caused an unprecedented economic shock to the European and global economy. In response, policymakers at EU and national level have acted decisively and at short notice to make available very significant financial resources to tackle the threat of a prolonged downturn. The immediate policy challenge now is to ensure that these resources are used in the most effective and efficient manner to put Europe back on track for a fast and sustained economic recovery and to increase the resilience of our economies and societies to potential future disruptions.

Building resilience requires awareness of and response to the underlying dynamics of industrial transition. While the pandemic itself is having asymmetric affects across different industrial ecosystems and will require differentiated responses from industry and other partners to transform and ensure resilience, there are longer-term underlying sources of industrial transition that pre-date the COVID-19 pandemic and that interact with policy responses to the pandemic.

In particular, the **digital and green transitions** are widely recognised to be the key drivers of current and future industrial change, as reflected in their identification as the two key levers of an industrial strategy for Europe (European Commission, 2020). To these drivers we can add the growing concern of **economic and social resilience**, both in the explicit context of the COVID-19 pandemic and in the more general context of challenges to the multilateral international system.

As a key focal point within Europe for place-based and activity-specific collaboration, cluster organisations and cluster policies play a catalytic role in shaping industrial transitions and building resilience. Building on the rapid short-term collaborative responses of cluster organisations in the wake of the COVID-19 pandemic, policymakers at all levels now need to use the tools and instruments at their disposal to equip them further in fulfilling this role. Indeed, in December 2020 the European Expert Group on Clusters adopted a set of [15 recommendations](#) on how the activities of clusters should be refocused on leading the green transition, accelerating the digital transition, and building resilience. During 2021, the Expert Group has been working through a series of webinars that discussed practical suggestions for policymakers and cluster managers how to operationalise the recommendations and explored concrete existing good practices.

Against this backdrop, the aim of this paper is to provide the basis for operationalising these recommendations, by developing a toolkit that policymakers can use to leverage the power of clusters to build greener, more digital and resilient economies. Sections 2, 3 and 4 set out the rationale for clusters playing a key role in supporting greening, digitalisation, and resilience. Section 5 then establishes a typology of actions, with concrete examples, within specific key areas where policymakers can leverage clusters to boost green transition, digital transition and resilience. Moreover, this typology of actions is explicitly linked to the recommendations of the European Expert

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[1] European Commission – European Expert Group on Clusters, December 2020. Recommendation Report.

Group on Clusters, with the aim of identifying gaps and providing a basis for better understanding the challenges of operationalisation of the recommendations. The paper as a whole is envisaged as the starting point for a **_dynamic toolkit_** that will evolve over time, integrating new experiences and examples.

Questions for feedback

During the event, we welcome feedback on the following points:

- Are the principal areas in which clusters can support the green transition, the digital transition and resilience well captured?
- Are the roles of clusters and cluster policies in fostering the twin transition and resilience illustrated with relevant examples?
- Are there other examples and policy actions that should be added?
- What would make this Toolkit more useful to cluster stakeholders across Europe? Please differentiate between cluster managers, cluster policy-makers and other cluster actors.
- Do you have any examples/suggestions on how the Recommendations from the Expert Group could be operationalised further?

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Clusters and green transition

Green transition is key for Europe's economic recovery

The economic recovery post COVID-19 is taking place in the context of a long-term transition to an economy which has lower negative impacts on the environment by using less resources and producing less harmful emissions than current economic models. In 2019 the European Commission reaffirmed and further increased the ambition and speed of this transition with its *Green Deal for Europe* (European Commission, 2019).

The Green Deal for Europe establishes a strong focus on green transition in all relevant policy areas to ensure that increased climate ambitions and other environmental objectives can be reached quickly (Figure 1). As a broad-based strategy the European Green Deal affects all economic sectors and value chains, intersecting with many that have also been strongly affected by the COVID-19 crisis. Those economic sectors need support to both recover from the COVID-19 crisis and to build the value chains of the future that bring together economic efficiency and environmental sustainability. Making support for companies in the COVID-19 crisis consistent with the green transition is crucial for long-term recovery and resilience of the European economy.

Figure 1: The European Green Deal
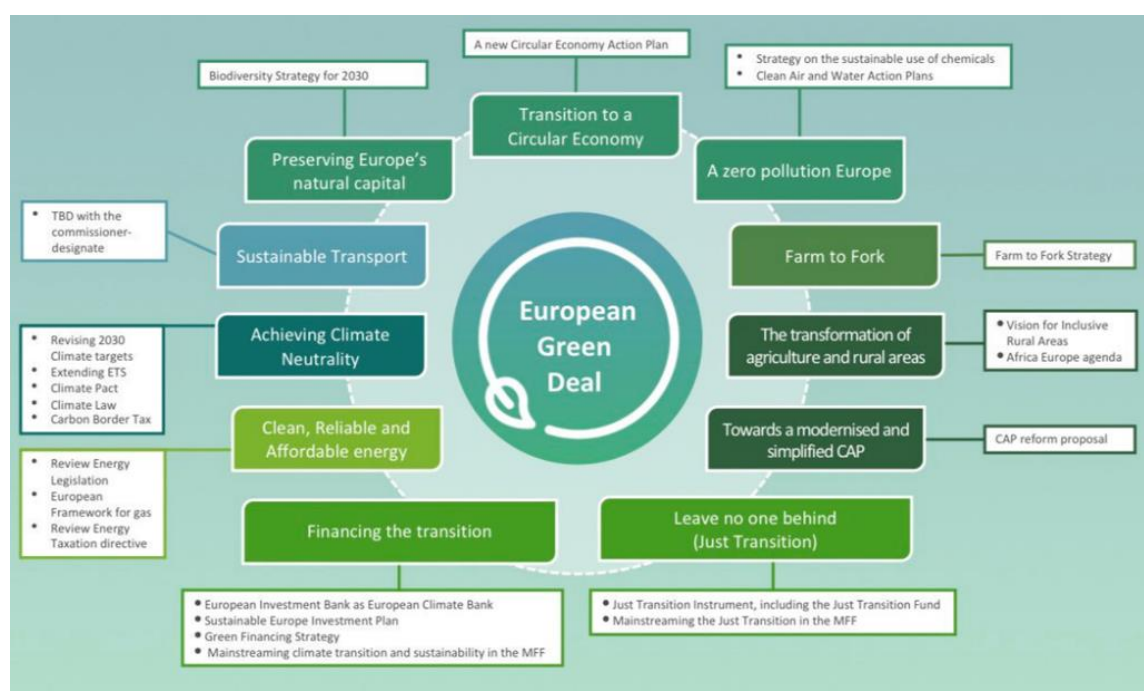
Source: EU 2019.

## Clusters can act as catalysts for green transition

The greening of our economies requires significant changes in production methods, consumption patterns and value chains. The current economic system still uses a substantial amount of fossil fuels to produce power, heat homes or for transport, while many renewable resources are overused (water,

soil), and many production processes produce toxic waste harming the environment. Shifting the current system to an economy that uses resources efficiently, produces power from renewable sources and transports without fossil fuels will require changes in several areas:

- **Financing:** The change to production processes and consumption patterns will reduce the value of many existing production facilities and require the setup of new facilities and infrastructure which will require funding. Additional funding is also needed for reskilling workers as some of their current skills will become obsolete. Ensuring that this funding goes to the actors which drive the transition is therefore crucial.

- **Research:** For many parts of the transition, enabling technical solutions are not yet developed or could be made more effective and efficient. Making sure that this research is funded and that innovative solutions are taken up by companies and organisations will be a crucial part of a successful transition.

- **Changing and building new value chains:** Even with effective funding and research, the central part of a successful transition to a greener economy will be to bring the right actors together to change existing value chains and to build new ones. Indeed, helping actors from different sectors, financial institutions and research institutions to organise better production processes is at the heart of the green transition.

As hubs of collaboration between large and small firms, research organisations and the public sector, **cluster organisations** can play a central role in catalysing the transition towards new, more sustainable value chains. In particular, they can gather the ***intelligence*** needed to help companies find the right value chain and their place in it, provide ***business support*** for SMEs and start-ups to fill missing links in value chains, and facilitate the ***networking*** that is needed to help companies find the right partners or clients for their new or changed products or production processes (Figure 2).

Figure 2: Clusters and Green Transition
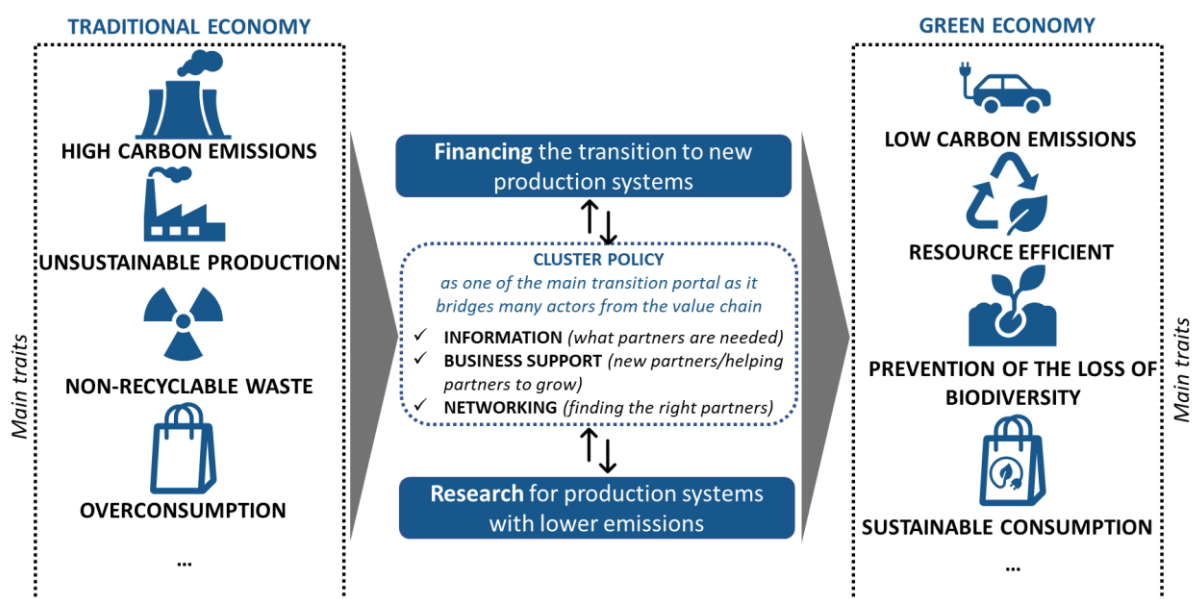
Source: European Cluster Collaboration Platform.

Clusters and digital transition

Digital transition is key for Europe's economic recovery

Like the green transition, it was widely acknowledged well before the COVID-19 pandemic that European industry was undergoing a deep and long-term digital transformation which requires fundamental reconfiguration of industrial production, distribution channels and business models. This was clearly reflected in the European Commission's (2020a, 2020b) *Industrial Strategy for Europe* and *SME Strategy for a Sustainable and Digital Europe* and was already being put into practice by the work of over 200 operational *Digital Innovation Hubs* that are supporting SME digitalisation, many of them linked explicitly to regional *Smart Specialisation Strategies*.[2]

The COVID-19 pandemic has accelerated this digital transition, as a consequence of: (i) the sudden changes in patterns of demand brought about by the health crisis and measures to mitigate it; (ii) the dramatic rise in home-working; and (iii) the disruptions to traditional supply chains. These have prompted many companies to rapidly re-think their operations and value propositions, and to fast-track the adoption of digital solutions within production processes, distribution channels and business models.

While the acceleration of the digital transition has been critical in resisting the effects of the pandemic in the short-term, it will also be key to medium-term recovery, where 'life with the virus' implies ongoing adaptations of production processes and consumption patterns. Most critically, however, embracing digital transition is vital for a sustainable and long-term recovery as European industry must reap the innovation, productivity and environmental benefits of digitalisation to remain globally competitive.

The digital transition can be broken down into a number of separate, yet related transformations (Figure 3). These range from the roll-out of digital infrastructure, which has taken up much public (and private) investment to date, to the emergence of new technology driven by private sector innovation and spearheaded by larger companies, the development of new services, and the adoption of digital business models that affect the entire economy (with a focus on SMEs, start-ups and scale-ups).

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[2] See: https://s3platform.jrc.ec.europa.eu/digital-innovation-hubs

Figure 3: Four levels to the digital transition
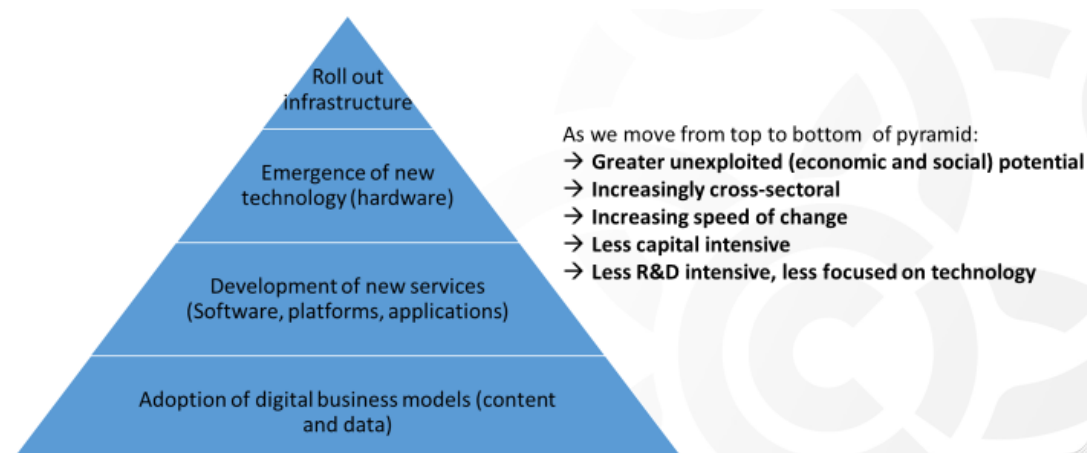
Source: European Cluster Collaboration Platform.

Given its broad base and importance, the bottom part of the pyramid (adoption of digital business models) should be of primary concern to policymakers, as this is where the greatest economic and social potential lies. It is at this level where change needs to happen fastest, but also where there is often great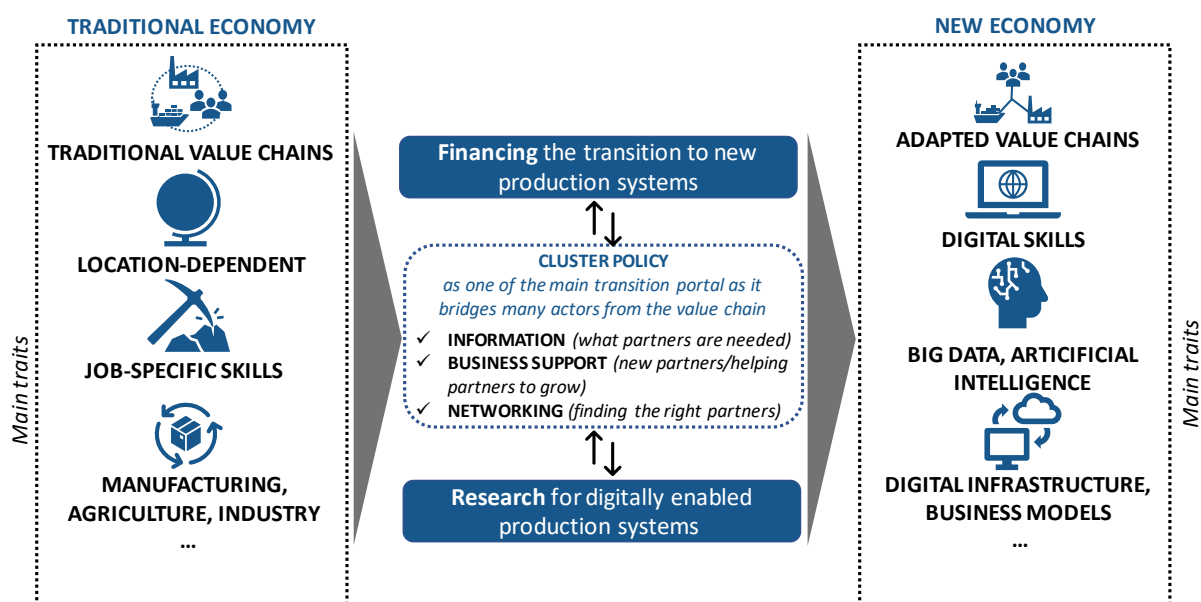est resistance to change. This part of the transition is less capital/R&D/technology intensive and more focused on business model innovation. Thus, while targeted public funding (e.g. through public procurement, PPPs, state aid and other instruments) is very important at the top of the pyramid, softer networking policies can play a particularly strong role in fostering the required business model innovation, which is inherently cross-sectoral and links across geographies and value chains.

Clusters can act as catalysts for digital transition

The collaborative dynamics within clusters provide an important catalyst for digital transition across the pyramid set out in Figure 3, and particularly at the lower levels. These are processes that require bringing together different capabilities and complementary decision-making capacities. For example, the digitalisation of production processes typically requires collaboration between firms with manufacturing capabilities and those with ICT capabilities, and servitisation or new business models associated with many forms of digitalisation require industrial firms to work together with knowledge intensive business services (KIBS). Likewise, deep and widespread digitalisation of industry requires collaborative innovation, skills development and infrastructure investments that span business, research organisations, training organisations and government. In short, paving the way to digital transition requires timely **intelligence**, tailored **business support** and continual **networking** opportunities, which is in the DNA of cluster organisations (see Figure 4).

Figure 4: Clusters and Digital Transition

TRADITIONAL ECONOMY

TRADITIONAL VALUE CHAINS

LOCATION-DEPENDENT

JOB-SPECIFIC SKILLS

MANUFACTURING, AGRICULTURE, INDUSTRY ...

Main traits

Financing the transition to new production systems

CLUSTER POLICY
as one of the main transition portal as it bridges many actors from the value chain
✓ **INFORMATION** *(what partners are needed)*
✓ **BUSINESS SUPPORT** *(new partners/helping partners to grow)*
✓ **NETWORKING** *(finding the right partners)*

Research for digitally enabled production systems

NEW ECONOMY

ADAPTED VALUE CHAINS

DIGITAL SKILLS

BIG DATA, ARTICIFICIAL INTELLIGENCE

DIGITAL INFRASTRUCTURE, BUSINESS MODELS ...

Main traits

*Source: European Cluster Collaboration Platform.*

Clusters and resilience

Resilience is key for Europe's economic recovery

The European Commission's first *Strategic Foresight Report* (European Commission, 2020c) sets out the concept of resilience as the new compass for policies to guide Europe's economy recovery. As such, it identifies four key dimensions of resilience: socioeconomic, green, digital and geopolitical. These are inter-related, and at the heart of them all is the capacity of European industry to adapt and transform itself.

In a complex system, resilience refers to the way in which the system as a whole responds to external (or internal) shocks through adaptation. A resilient system is one that can adapt fast, in ways that absorb the shock and minimise negative impacts on the system, and at the same time leverage on any opportunities created by the shock. Increasing resilience therefore requires an ability to **anticipate** shocks, **monitor** their evolution and potential impacts, produce appropriate **responses** at the level of the system as a whole or one of its sub-elements, **recover** and **learn** for the future.

Four categories of company-level responses that characterise a resilient system were identified in an earlier ECCP Discussion Paper on supply chains: hold out, evaluate, reconceive and reinforce (Kamp *et al.,* 2020, see Figure 5).

Figure 5: Resilience is a function of business responses to a shock
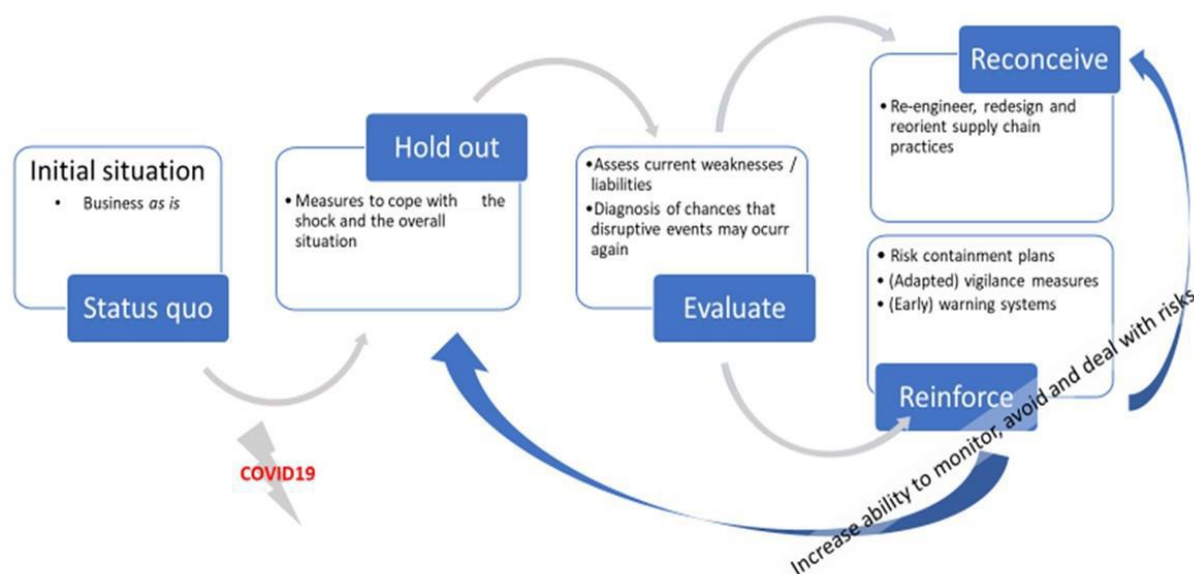
Source: Kamp et al (2020).

With regard to Europe's economic recovery there is also a **temporal dimension**, with an important distinction to be made between short-term resilience and long-term resilience.

- When it comes to **short-term** resilience, *adaptability* and *agility* are key, both in terms of the responses of firms and the responses of governments. The COVID-19 pandemic has demonstrated very clearly the need for industry to quickly adapt to radically changing circumstances with regard to supply chains, production processes and markets, and for agile

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public policies that support them in doing so and shield them from the immediate effects of these shocks.

- **Long term** resilience is closely related to the ***green & digital transitions*** discussed in the previous sections, and a central pillar of *Next Generation EU*. The geopolitical dimension of resilience is also reflected in the EU's ability to influence the shape of global markets, through soft power tools such as standard-setting (in product and service markets and their regulation), pioneering initiatives (such as the issuing of social (and/or green) bonds) and the recent drive towards strategic autonomy*.*

Clusters can act as catalysts for resilience

Cluster organisations have long played a critical role in fostering the economic resilience of their member firms. Indeed, their core value propositions are based on boosting the competitiveness of firms through facilitating stronger and more effective cooperation around common challenges related to issues such as innovation, internationalisation, value chains, skills, quality, infrastructure and finance. Responding effectively to emerging challenges in these areas are vital for the short-term and long-term resilience of companies, and the cooperative dynamics facilitated by cluster organisations in this regard are particularly important for SMEs, whose limited resources and capabilities make individual responses to many of these challenges difficult.

In the short-term, cluster organisations can support the sourcing and sharing of strategic ***intelligence*** that helps to anticipate shocks and monitor their evolving impacts. They can also provide specialised ***business services*** and facilitate ***networking*** that helps SMEs respond to those shocks quickly. In terms of medium-term and long-term resilience, the collaborative dynamics within clusters can be leveraged towards addressing the shared challenges of green and digital transitions, as highlighted in the previous sections, and to fostering sustained adaptive and learning capacity among SMEs.

The previous sections have set out why cluster organisations are key players in the European landscape when it comes to fostering a green, digital, and resilient economy. This section presents a toolkit for national and regional policymakers to support them in leveraging the potential of clusters as part of their efforts to promote a green transition, a digital transition and economic resilience.

The four phases of the toolkit

The toolkit is structured to help policymakers identify concrete actions that they can develop through clusters and provide inspiring examples from current practice. It is envisaged as a **_dynamic toolkit_** that will evolve over time by integrating new experiences and examples from the collective intelligence of the cluster policy community, harnessed through the European Cluster Collaboration Platform (ECCP).

The toolkit is based on a typology that distinguishes between the key dimensions of the work that cluster organisations perform in practice, to identify specific policy actions that can support and leverage the collaborative dynamics within clusters. The figure below indicates how the toolkit can be used in practice by policymakers.

**Figure 6: The toolkit: a roadmap to cluster policy action**
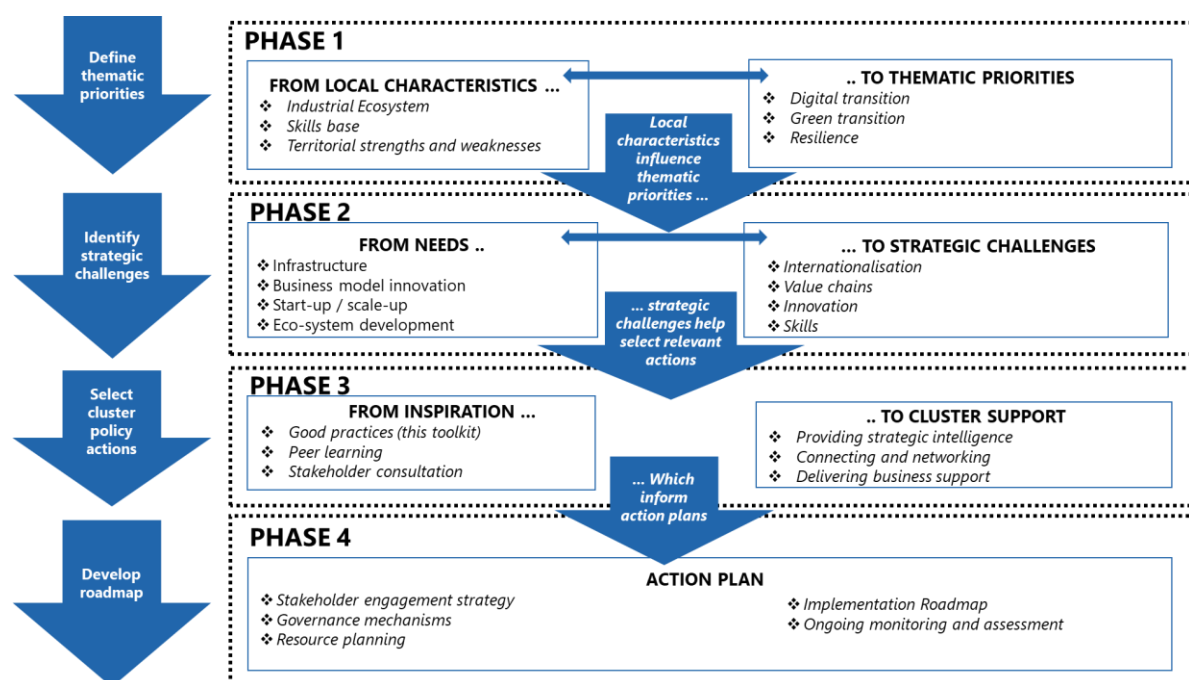
The use of the toolkit is envisaged in a four-phase sequential process (in practice there may be overlaps between some of the phases of course):
- Defining priorities
- Identifying challenges
- Selecting cluster policy actions
- Developing a roadmap

Each phase involves a journey from the characteristics of the local environment, needs and stakeholder input (on the left side of the box) to the definition of priorities, challenges and support actions.

The phases build upon one another vertically and in travelling from one phase to another, the policymaker is guided from defining very broad thematic priorities (green, digital or resilience) for action to identifying the key challenges of the local territory in these priority areas (internationalisation, value chains, innovation or skills) to selecting the appropriate cluster function to respond to these challenges. Indeed, clusters are a tool for the transformation of the industrial system through three primary functions. They are:
1. Sources of market (and non-market) **intelligence**
2. Brokers of **collaborative** stakeholder networks
3. Providers of **business services**

Figure 7: Functions of clusters
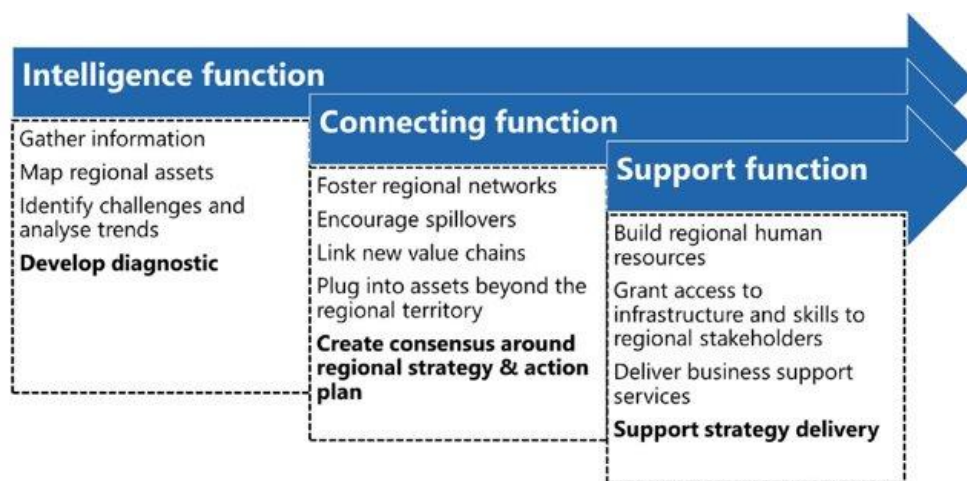
Source: European Observatory for Clusters and Industrial Change, 2019

Bringing together these dimensions results in a matrix of possibilities where policymakers can seek to act to strengthen the existing work of cluster organisations, promote new activities, and/or leverage cluster dynamics for achieving broader policy goals related to greening, digitalisation and/or resilience.

Table 1: Overview of dimensions on cluster functions, strategic challenges and thematic priorities

	Intelligence	Networking	Business services
Innovation	Policy actions that leverage clusters to support:		
Skills	Green transition		
Internationalisation	Digital transition		
Value Chains	Resilience		

Finally, in phase 4 of the roadmap for the use of the policy toolkit (see Figure 6), these phase-specific journeys culminate in the formulation of action plans for the local territory including stakeholder

engagement strategy, governance mechanism, resource planning, specific actions and ongoing monitoring and assessment mechanisms.

Using the three dimensions in Table 1 (cluster functions, strategic challenges and thematic priorities), we have categorised cluster policies in and outside the EU that can serve as examples for policymakers who want to leverage the power of clusters to address their strategic challenges and thematic priorities. The toolkit then develops a comprehensive, dynamic and accessible map of policy examples for each of the cells in the matrix.

Each of the tables below focuses on one thematic priority (digital, green or resilience) and it provides examples for each strategic challenge (Innovation, Skills, Internationalisation or Value Chains) and for each cluster function (intelligence, networking and business services).

Cluster policy toolkit for the green transition

Table 2: Policy actions through clusters to support green transition

	Intelligence	Networking	Business services
Innovation	Identify and collect green innovation needs and summarise information on existing green innovation potential and engage clusters in European alliances and missions to identify opportunities and barriers for greening Example: Brussels Regional Programme for the Circular Economy (Belgium), Circular Flanders, Circular Wallonia (Belgium)	Mobilise clusters to bring together the different partners required to make innovative circular economy and/or resource efficiency approaches work in a regional and/or inter-regional context and facilitate collective investments in demonstration facilities Example: Flanders Industry Innovation Moonshot (Belgium) Example: GreenPact Collaborative Platform (Netherlands)	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. Example: Circular Economy Project Management System (France) Example: Green National Champions Programme (Hungary)
Skills	Use clusters to collect training needs and identify training opportunities for green reskilling Example: SME Initiative Energy Transition and Climate Protection (Germany)	Encourage clusters to become active partners in regional and inter-regional skills initiatives (including the EU Pact for Skills) Example: Covasna Business Incubator (Romania) Example: Hydrogen Technology Cluster Australia (H2TCA) (Australia)	Support clusters to organise and/or collaborate around training services to reskill or upskill their members for the green transition Example: Polish Register of Cleaner Production and Responsible Entrepreneurship (Poland)

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Internationalisation	Use clusters as antennae to collect intelligence on international research, suppliers and business opportunities in green transition Example: Cluster Excellence Denmark (Denmark)	Leverage the international connections of clusters to become nodes in new international value chains that enable less resource intensive solutions Example: Innovation Networks Denmark (Denmark) Example: EUSAIR strategy (Bosnia and Herzegovina)	Mobilise clusters to provide tailored services that connect regional companies to international circular and resource-efficiency solutions, through common procurement or the organisation of digital missions (or inverse-missions) Example: GreenEvo - Green Technology Accelerator (Poland)
Value Chains	Support the development of cluster strategies and/or projects that detect opportunities for circular solutions among and between clusters Example: Innovation clusters Saxony (Germany)	Facilitate competitions to form new clusters that tackle existing challenges Example: State aid programme for the system of stimulating the production of electricity from renewable energy sources and high-efficiency cogeneration (Croatia) Example: Hydrogen Technology Cluster Australia (H2TCA) (Australia)	Use clusters to provide start up support to fill gaps in value chains Example: Innovation clusters Saxony (Germany)

Cluster policy toolkit for the digital transition

Table 3: Policy actions through clusters to support digital transition

	Intelligence	Networking	Business services
Innovation	Provide overviews on digitalisation trends and their relevance for specific sectors or clusters Example: Digital Wallonia (Belgium) Example: House of digitalisation (Austria)	Leverage clusters to promote collaborative research projects or make collaborative investments in innovation infrastructure and integrate cluster activities with Digital Innovation Hubs Example: Digital Innovation Hub (OST) (Austria)	Work with clusters to upgrade their business services provision in the field of adoption of digitalisation. Integrate cluster activities with Digital Innovation Hubs Example: Digital Rocket LT (Lithuania)
Skills	Use clusters as an antenna for early-warning intelligence on digital skills gaps Example: SFI Research Centres (Ireland)	Encourage clusters to become active partners in regional and inter-regional skills initiatives (including the EU Pact for Skills) Example: Living Labs in Wallonia (Belgium) Example: Red Cluster Colombia (Colombia)	Mobilise clusters to develop digital skills training services that respond to the needs of their members, in collaboration with local/international universities/VET centres Example: SFI Research Centres (Ireland)

Internationalisation	Collect and provide intelligence on foreign suppliers or sales markets for local companies Example: Cluster Excellence Denmark (Denmark)	Connect companies globally around digitalisation solutions, through international cluster collaboration such as that facilitated by the ECCP Example: Innovation Networks Denmark (Denmark)	Mobilise clusters to provide tailored services that connect regional companies to international digital solutions, through common procurement or the organisation of digital missions (or inverse-missions) Example: Hellenic Technology Clusters Initiative (HTCI) (Greece)
Value Chains	Develop cluster strategies for a digital economy Example: Logistics Resilience Task Force (Belgium) Example: Industry4Ukraine (Ukraine)	Mobilise clusters as a focal point for bringing together firms to strengthen regional and inter-regional value chains and/or to reinforce public-private partnerships (PPP) Example: The initiative Connected Mobility - The Smart Future (ICM) (Austria) Example: Eureka Clusters Artificial Intelligence (Singapore)	Use clusters to provide start-up support to fill gaps in value chains Example: The initiative Connected Mobility - The Smart Future (ICM) (Austria) Example: Eureka Clusters Artificial Intelligence (Singapore)

Cluster policy toolkit to support resilience

Table 4: Policy actions through clusters to support resilience

	Intelligence	Networking	Business services
Innovation	Collection and presentation of market and technology trends relevant for local industry Example: Cluster Platform Austria (Austria) Example: Cluster Observatory (India)	Support collaborations of research institutions and companies to safeguard competitiveness Mobilise clusters as nodes for social innovation that responds to societal challenges at the community level Example: Estonian cluster website (Estonia)	Build capacity among clusters to play a guiding role in SME-innovation by awareness-raising and providing R&D services that normally only large companies would be able to afford Example: Development voucher (Estonia) Example: Cluster Info Centres (Turkey)
Skills	Use clusters to collect skills needs and identify training opportunities relevant for specific priority sectors	Encourage clusters to become active partners in regional and inter-regional skills initiatives (including the EU Pact for Skills)	Leverage clusters to provide dynamic advanced training services to their cluster members

	Example: TANDEM / inter-cluster mentoring (France)	Example: Centres of Excellence and Centres of Competence (Bulgaria) Example: Co-learning space for Hamburg's clusters (Germany)	Example: Clusters' SMEs' Territories Invest (France) Example: Red Cluster Colombia (Colombia)
Internationalisation	Leverage clusters to develop and provide evidence on international market developments, sourcing risks Example: Cluster Platform Austria (Austria) Example: Cluster Observatory (India)	Use international cluster cooperation to share experiences and find solutions to shared challenges related to the COVID crisis Leverage international cluster cooperation to boost supply chain security Develop a strategic approach to entering global markets through European cluster collaboration Example: Support programme for the internationalisation of clusters and networks (Germany) Example: Ukrainian Clusters Portal – Ucluster (Ukraine)	Mobilise clusters to provide tailored services that connect regional companies to international best practices that support their ongoing learning and adaptability Example: Supporting quality services provided by professional cluster (Hungary) Example: Go International Slovenia (Slovenia)
Value Chains	Provide intelligence on necessary components of new value chains Example: Logistics Resilience Task Force (Belgium)	Leverage clusters to bring regional actors together to build more resilient regional value chains Example: Single Window Initiative (Estonia) Example: Manufacturing Extension Partnership National Network (USA)	Use clusters as a node for supporting additions to regional value chains with start -up support Example: The initiative Connected Mobility - The Smart Future (ICM) (Austria) Example: Business incubation and entrepreneurial support for recovering from COVID-19 epidemic - NewCo Helsinki (Finland) Example: Example: FI-Media (India)

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Operationalising the Recommendations of the Cluster Expert Group

This framework developed above can be used to further deepen reflection and provide the basis for action around the 15 recommendations adpoted by the European Expert Group on Clusters in December 2020. Table 5 organises the actions and examples highlighted in Tables 2-4 according to these 15 recommendations.

Table 5: Operationalising the recommendations of the Cluster Expert Group

	Intelligence	Networking	Business services
LEAD GREEN TRANSITION			
Use clusters as drivers of change, accelerators and enablers of the green transition		Mobilise clusters to bring together the different partners required to make innovative circular economy and/or resource efficiency approaches work in a regional and/or inter-regional context and facilitate collective investments in demonstration facilities Example: GreenPact Collaborative Platform (Netherlands)	Support clusters to organise and/or collaborate around training services to reskill or upskill their members for the green transition Example: Innovation clusters Saxony (Germany)
Use clusters to develop and implement circular economy strategies and action plans	Use clusters as antennae to collect intelligence on international research, suppliers and business opportunities in green transition Example: Circular Flanders (Belgium)	Facilitate competitions to form new clusters that tackle existing challenges Example: The Roadmap for Transformation Towards Circular Economy (Poland)	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. Example: Cleantech Estonia (Estonia)
Recognise clusters as essential contributors to European alliances and missions	Identify and collect green innovation needs and summarise information on existing green innovation potential and engage clusters in European alliances and missions to identify opportunities and barriers for greening		

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Develop capacity-building programmes to help clusters provide sustainable advisory services	Example: Circular Wallonia (Belgium)		
	Support the development of cluster strategies and/or projects that detect opportunities for circular solutions among and between clusters Example: Flanders Industry Innovation Moonshot (Belgium)		Support clusters to organise and/or collaborate around training services to reskill or upskill their members for the green transition Example: Green National Champions Programme (Hungary)
Use clusters as intermediaries to support the green transition			
ACCELERATE DIGITAL TRANSITION			
Mobilise clusters to participate in digital and green skills related initiatives	Use clusters as an antenna for early-warning intelligence on digital skills gaps. Example: Digital Wallonia (Belgium)	Work with clusters to upgrade their business services provision in the field of adoption of digitalisation. Example: Skelleftea Digital Alliance (Sweden)	Mobilise clusters to develop digital skills training services that respond to the needs of their members, in collaboration with local/international universities/VET centres Example: Made Different (Belgium)
Increase cluster capacity to provide advanced business services	Use clusters as an antenna for early-warning intelligence on digital skills gaps Example: House of Digitalisation (Austria)	Leverage clusters to promote collaborative research projects or make collaborative investments in innovation infrastructure and integrate cluster activities with Digital Innovation Hubs Example: The initiative Connected Mobility - The Smart Future (ICM) (Austria)	Work with clusters to upgrade their business services provision in the field of adoption of digitalisation. Example: The initiative Connected Mobility - The Smart Future (ICM) (Austria)
Make clusters an integral part of	Collect and provide intelligence on foreign suppliers or	Mobilise clusters as a focal point for bringing together firms to strengthen regional and inter-regional value	

	sales markets for local companies Example: Digital Innovation Hub OST (Austria)	chains and/or to reenforce public-private partnerships (PPP) Example: AgroHub (Bulgaria)	
Use clusters to initiate new and to reinforce existing Public-Private Partnerships (PPPs)	Develop cluster strategies for a digital economy Example: AI for the Netherlands (Netherlands)	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) Examples: Logistics Resilience Task Force (Belgium)	
Use clusters as strategic agents for the implementation of European digital policies	Provide overviews on digitalisation trends and their relevance for specific sectors or clusters Example: bedigital (Belgium)	Encourage clusters to become active partners in regional and inter-regional skills initiatives (including the EU Pact for Skills) Example: The Industry of the Future Platform Foundation (Poland)	Support collaborations of research institutions and companies to safeguard competitiveness Example: House of Digitalisation (Austria)
BUILD RESILIENCE			
Use the collective intelligence of EU clusters to make value/supply chains more resilient	Collection and presentation of market and technology trends relevant for local industry Example: Cluster Platform Austria (Austria) Example: Logistics Resilience Task Force (Belgium)		Build capacity among clusters to play a guiding role in SME-innovation by awareness-raising and providing R&D services that normally only large companies would be able to afford Example: Example: TANDEM / inter-cluster mentoring (France)
Develop an active role of clusters in local labour markets	Use clusters to collect skills needs and identify training opportunities relevant for specific priority sectors Example: Technopole Programme (Austria)	Mobilise clusters as nodes for social innovation that responds to societal challenges at the community level Example: Co-learning space for Hamburg's clusters (Germany)	

Use clusters to identify and implement shared value initiatives		Leverage clusters to bring regional actors together to build more resilient regional value chains Example: Swelife (Sweden)	Develop international value chains by bringing clusters together in Innovation super clusters. Example: GreenEvo - Green Technology Accelerator (Poland)
Reinforce activities to develop a strategic approach to international cluster collaboration	Provide intelligence on necessary components of new value chains Example: Cluster Excellence Denmark (CED)	Develop a strategic approach to entering global markets through European cluster collaboration Example: Support programme for the internationalisation of clusters and networks (Germany) Example: Estonian Clusters website (Estonia)	Use clusters as a node for supporting additions to regional value chains with start-up support Example: Go International Slovenia (Slovenia)
Initiate cross-sectoral, interdisciplinary and transnational cluster collaboration		Use international cluster cooperation to share experiences and find solutions to shared challenges related to the COVID crisis Leverage international cluster cooperation to boost supply chain security Develop a strategic approach to entering global markets through European cluster collaboration Example: Centres of Excellence and Centres of Competence (Bulgaria)	

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Annex 1 - References

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