

# Key features of cluster development programmes – a review of international policy practice

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Berlin/Tashkent, March 2022

# Outline

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1. Introduction
2. Key features of clusters
3. Methods for identifying (emerging) clusters
4. Cluster policy tools
5. Lessons learnt

# 1. Introduction

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**To assist the Government of the Republic of Uzbekistan in designing an effective cluster policy package, this briefing reviews relevant international experience taking into account synergies with related policy areas**

- In many countries, cluster policies and programmes have been successfully introduced to stimulate innovation and strengthen the competitiveness of SMEs
- Against this background, the Government of the Republic of Uzbekistan is interested in leveraging clusters for industrial development
- In order to support the necessary planning processes and policy decisions, this policy briefing focuses on:
  - Outlining key features of clusters
  - Introducing quantitative and qualitative methods for identifying and prioritising clusters
  - Reviewing common policy tools and organisational models for the implementation of cluster development programmes
- Throughout the document, practical examples are used to illustrate the key aspects and success factors

## 2. Key features of clusters – overview

Clusters are geographic concentrations of companies and supporting institutions that are actively collaborating in related fields and value chains. They share the following characteristics, which are illustrated by the practical example below and are explained in closer detail on the next pages

### Key characteristics:

### Silesia Automotive Cluster (Poland):

#### Critical mass

More than 170 companies and institutions are collaborating in the cluster – including large corporations, SMEs, universities, R&D institutions, technology centres and training providers

#### Specialisation

Next to automotive OEMs (e.g. Opel, Fiat) and tier 1 suppliers (e.g. ZF and Marelli Group), the membership comprises companies and institutions, which specialise in related fields, e.g. robotics, electronics, metal, plastics

#### Proximity

The Katowice Special Economic Zone (SEZ) forms the nucleus of the cluster, which covers an area with a radius of approximately 150 km around the zone

#### Facilitated linkages

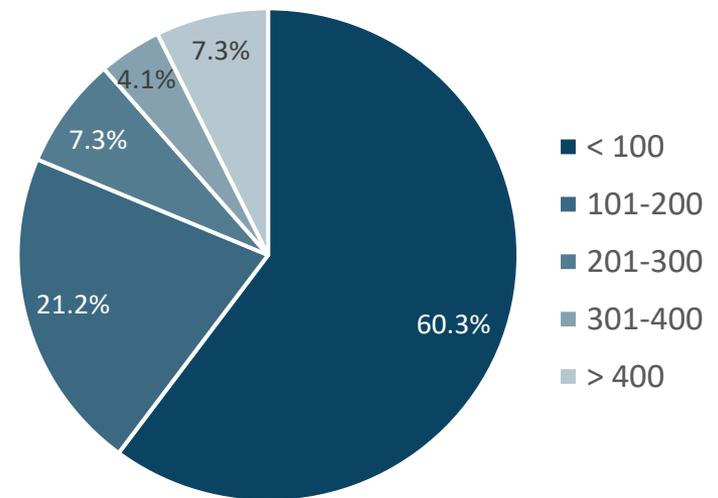
A cluster management, which is hosted by the SEZ administration, provides networking platforms and facilitates joint projects with a strong focus on innovation support and skills development (e.g. dual study programmes)

## 2. Key features of clusters – critical mass

**While the size varies across industries and countries, clusters need to have a certain critical mass to generate synergies and spill-over effects**

- Clusters need to have a sufficient size to develop specific skills, resources and assets
- More cluster actors offer a larger potential to foster productivity and innovation due to specialisation and competitive pressure
- In the EU, the majority of cluster initiatives has less than 100 members
- In knowledge-intensive industries such as biotech, clusters tend to be smaller than in “traditional” manufacturing industries (e.g. food or automotive)
- Experience shows, that a cluster initiative needs to attract at least 25 members in order to be viable

*Number of members in EU cluster initiatives*



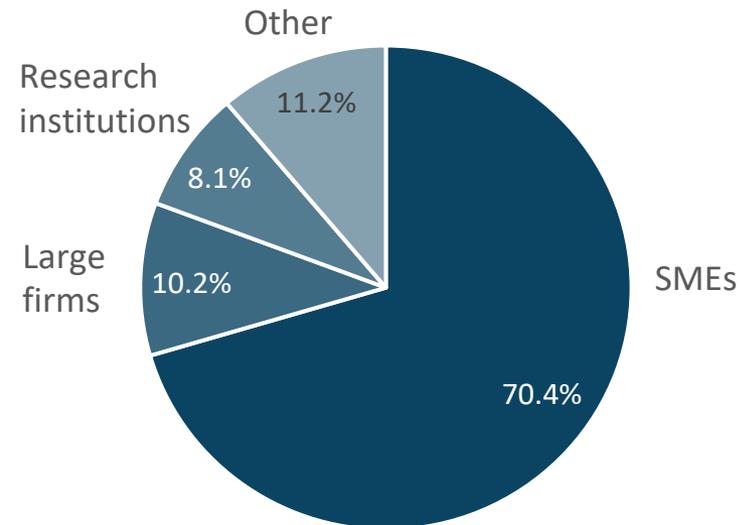
*Source: European Cluster Panorama 2021*

## 2. Key features of clusters – critical mass

**A balanced mix of SMEs and large anchor companies complemented by specialised service and training providers as well as academic and research institutions in a region provides a sound basis for the development of a cluster**

- Critical mass is not about large companies. The presence of one large company and its supply chain does not form a cluster
- SMEs are the backbone of clusters playing a critical role for regional innovation dynamics
- Approximately 70% of the 73,000 members of EU cluster initiatives are SMEs
- Large companies only account for about 10% of the membership
- In that context, it should be noted that cluster development is primarily driven by private companies according to international experience

*Composition of members in EU cluster initiatives*



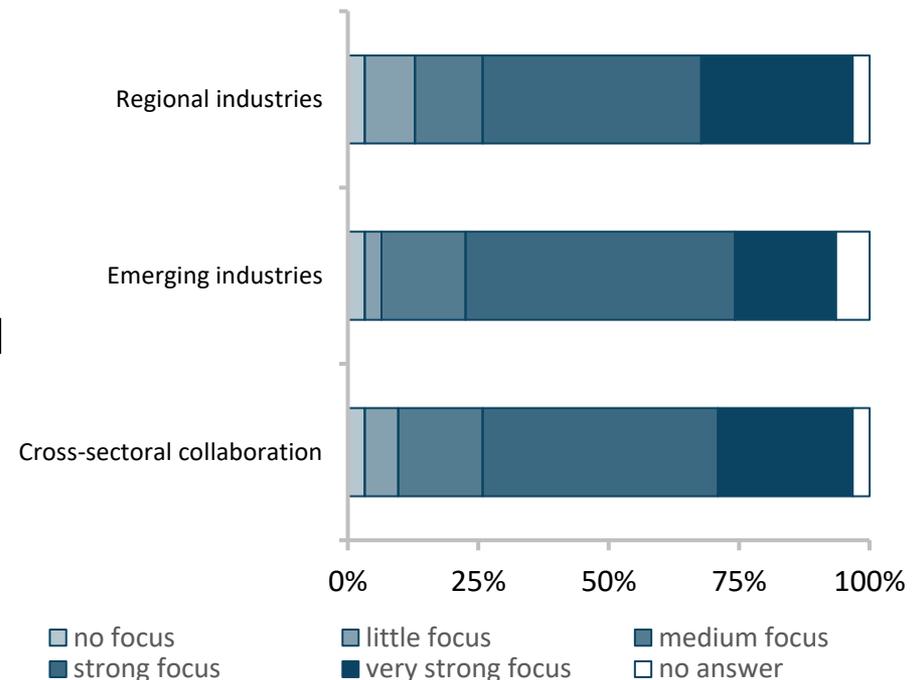
*Source: European Cluster Panorama 2021*

## 2. Key features of clusters – specialisation

**Clusters are based on specialisation in groups of related fields and value chains, not just one narrow activity**

- As illustrated by the mentioned example from Poland, clusters reflect the increasing cross-industry nature of value chains and innovation systems
- As companies focus on specific “core competencies”, it has become necessary to engage more with partners from a range of related fields
- To foster economies of scope, clusters need a sufficient breadth (variety of products and related value chains) and depth (stages of value chains covered) instead of a narrow specialisation
- A key success factor relates to finding the right balance between supporting existing and emerging industries and cross-sectoral collaboration

*Focus of national cluster programmes in the EU*



Source: European Observatory for Clusters and Industrial Change 2019

## 2. Key features of clusters – proximity

Furthermore, geographic proximity plays a critical role for the success of cluster development programmes. Most cluster initiatives cover a radius of less than 150 km around their nucleus

- Geographic proximity is important for:
  - Lowering transaction costs
  - Sharing information
  - Interacting with customers
  - Benefitting from specialised factor markets (e.g. labour, capital, technology)
- Personal contacts are key in this respect
- Typically, members of cluster initiatives accept traveling times of up to two hours
- Clusters often have a local centre or nucleus with a high concentration of companies and supporting institutions – such as a technology park or special economic zone

*Automotive clusters in Germany*



Source: Clusterplattform Deutschland

## 2. Key features of clusters – facilitated linkages

**In clusters, companies and supporting institutions are connected through multiple linkages that are typically facilitated by cluster initiatives and dedicated cluster management organisations**

- Cluster initiatives are organised efforts – similar to regional networks – to strengthen the competitiveness of a cluster and to foster linkages and collaboration between members
- The day-to-day operation is usually taken over by a cluster management organisation, which acts as service provider
- Cluster initiatives are based on the principles of coopetition and voluntary participation
  - While cooperating in one field, members remain competitors in other areas
  - There is no formal obligation to participate in cluster initiatives and joint activities nor to supply products / services to other members

### *Services of the cluster management of the “Odense Robotics” cluster initiative (Denmark)*

#### **Start-up support**

- Robotics Start-up Hub (incubator with testing facilities and mentoring)

#### **Innovation support**

- Industry 4.0 readiness mapping for SME
- Co-funding for innovation projects
- Digitalisation support programme
- Matchmaking services

#### **Business and supplier development**

- Support for supply chain management (e.g. supplier directory, seminars, upgrading)

#### **Skills development and recruiting**

- Training programmes
- Recruitment database and services

#### **Information and cooperation platforms**

- Networking groups
- Events

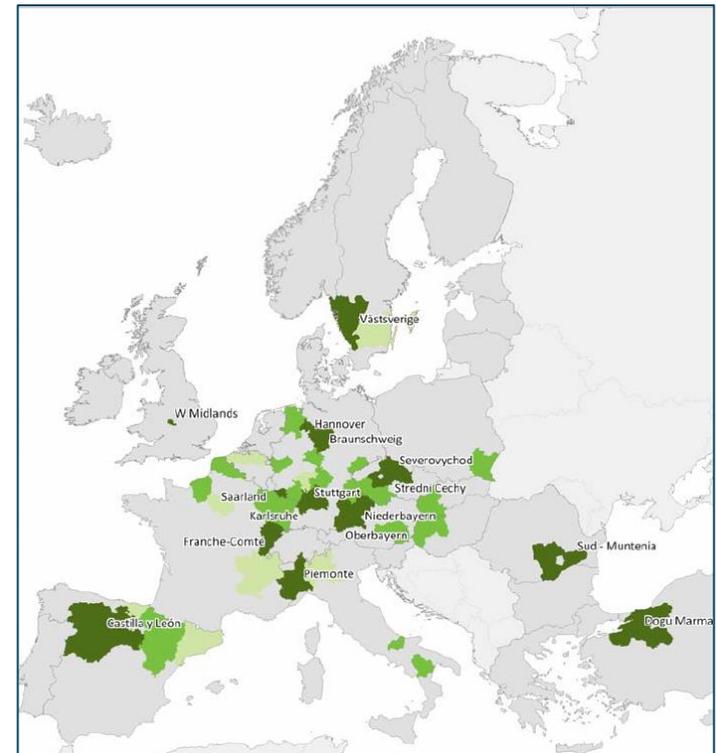
Source: Odense Robotics

### 3. Methods for identifying (emerging) clusters

To identify and prioritise clusters for policy measures, quantitative and qualitative methods are combined. Usually, a statistical cluster mapping forms the starting point

- Cluster mapping describes the quantitative measurement of the presence, size and performance of clusters across regions within a country or group of countries
- It is based on common definitions that identify cluster categories as groups of industries that empirically tend to be connected through localised spill-overs and linkages
- In the EU, 51 cluster categories were defined based on the 4-digit level of the NACE statistical classification of economic activities (e.g. automotive, furniture)

*Cluster mapping for European automotive clusters*



Source: European Cluster Observatory

# 3. Methods for identifying (emerging) clusters

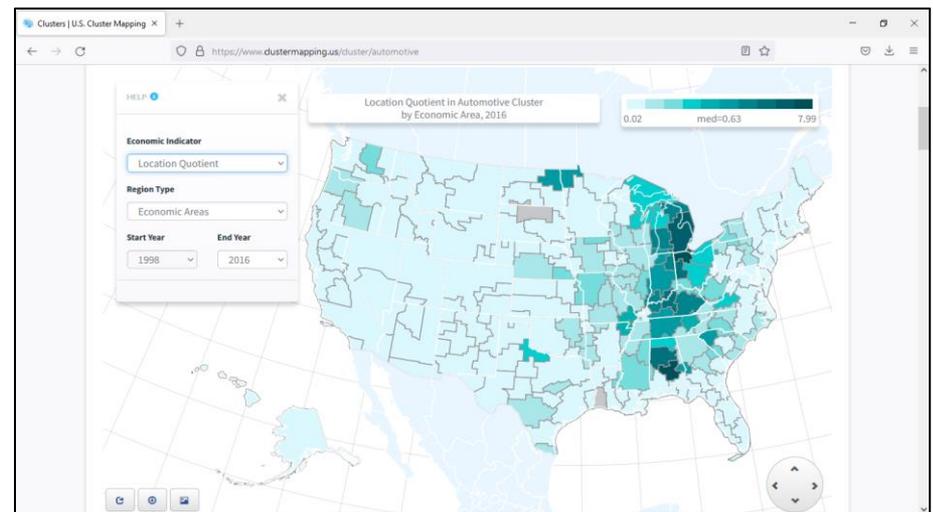
The location quotient is a commonly used indicator in cluster mappings to provide a first static overview of the specialisation pattern of a region or country

- The indicator compares the share of a cluster in total employment in a specific region / country with a reference area (national level or group of countries):

$$LQ_{ij} = \frac{\text{Employment in cluster } i \text{ in location } j / \text{Total Employment in cluster } i}{\text{Employment in location } j / \text{Total employment}}$$

- A value higher than 1 indicates an above average concentration of the cluster in the region or country
- Additional indicators used for cluster mappings comprise:
  - Wages
  - Value added
  - Productivity
  - High growth SMEs
  - Patents

*Identifying automotive clusters in the United States based on the location quotient*



Source: US Cluster Mapping

# 3. Methods for identifying (emerging) clusters

Statistical cluster mappings are typically complemented by surveys, interviews and expert workshops to capture the potential of emerging clusters and qualitative aspects of relevance for the design of the policy package

- Statistical mappings are important tools, but come with some limitations:
  - Statistical industry classifications and administrative regions often do not capture promising value chains, emerging industries and patterns of linkages and spill-overs
  - Official statistics do not provide information on the cooperation climate and dynamics within clusters
- A survey of regional development officials or branches of chambers of industry can be used to obtain further information on the (emerging) cluster landscape

*Extract from a survey carried out in Moldova*

1. Which clusters in your region have the most promising development potential?	A. _____	B. _____	C. _____
2. Is the concentration of these clusters in your region higher than in Moldova as a whole?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
3. Which are the (max. 2) most important companies in these clusters in your region?	1. _____ 2. _____	1. _____ 2. _____	1. _____ 2. _____
4. Which are the (max. 2) most important foreign owned companies which have recently invested in these clusters in your region?	1. _____ 2. _____	1. _____ 2. _____	1. _____ 2. _____
5. Which are the (max. 2) most important supporting institutions (e.g. training centres, universities, research institutions, associations) of relevance for these clusters in your region?	1. _____ 2. _____	1. _____ 2. _____	1. _____ 2. _____
6. Approximately, how many employees do these clusters have in your region?	No. _____	No. _____	No. _____

# 3. Methods for identifying (emerging) clusters

## Statistical cluster mappings are typically complemented by surveys, interviews and expert workshops (cont.)

- Once a number of promising clusters has been short-listed, interviews with actors at the local level (e.g. with companies, universities and R&D institutions, training providers) have proven helpful to assess the potential for the establishment of cluster initiatives and complementary support measures
- Finally, expert workshops or panels can be used to discuss and validate the findings from the cluster mapping, surveys and interviews
- The experts can rank the short-listed clusters based on a decision matrix integrating criteria such as:
  - Competitive position at int. level
  - Innovation and upgrading potential
  - Investment and employment creation potential

### *Exemplary questions for interviews at the cluster level*

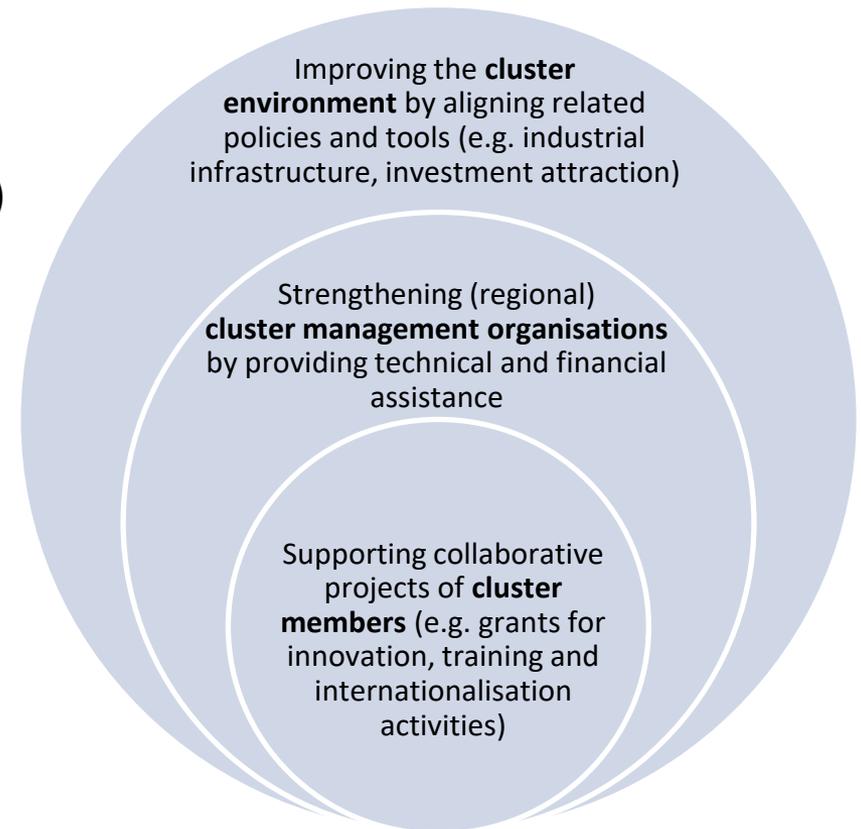
- How do you rate the potential to develop a cluster in the industry? What are key challenges?
- On which existing activities and structures could cluster development efforts build upon?
- What should be the key focus of a cluster initiative? Which value chains, technologies, markets should be addressed? What should be the geographic boundaries?
- Which companies or institutions could form the nucleus of the cluster?
- What activities and services should be provided by the cluster management? Could the cluster management be hosted by an existing institution?
- What type of support would be needed for the implementation of cluster structures?

## 4. Cluster policy tools – overview

The focus of cluster policy tools is not on creating new clusters from scratch, but on supporting and facilitating the development of existing and emerging clusters and on improving the environment for cluster success

- The following dimensions need to be considered when designing cluster policy tools:
  - Cluster members (e.g. companies, academic institutions, service providers)
  - Cluster management organisations
  - Cluster environment
- Policy tools often address more than one of those dimensions
- Furthermore, policy tools focus on both the hard infrastructure (e.g. technology parks) and the soft infrastructure (e.g. matchmaking platforms and services)

### *Dimensions of cluster policy packages*



## 4. Cluster policy tools – dimension cluster members

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**Direct support for (joint) activities and projects of cluster members forms a core element of cluster policy packages. Often, competition-based selection processes are used to focus support on the most promising initiatives**

- The Leading-Edge Cluster Competition in Germany, which was launched as part of the Federal Government's High-Tech Strategy constitutes a prominent example in this respect
- In a two-stage competition, 15 cluster initiatives were selected each receiving matching grants of up to EUR 40 m for a period of five years
- Reflecting the focus of the High-Tech Strategy, the selected clusters are active in the areas energy / climate, health, mobility and digital technologies
- Eligible activities / expenditure of cluster members include:
  - R&D projects including capital expenditure for equipment and machinery
  - Skills development and talent attraction measures
  - Development and testing of new cooperation formats
  - Marketing and promotion
- A follow-up programme is supporting the internationalisation of the clusters

## 4. Cluster policy tools – dimension cluster management

In addition, policy packages typically include technical and financial assistance for cluster management organisations that facilitate joint activities in regional cluster initiatives with a needs-oriented portfolio of services (see example on page 9)

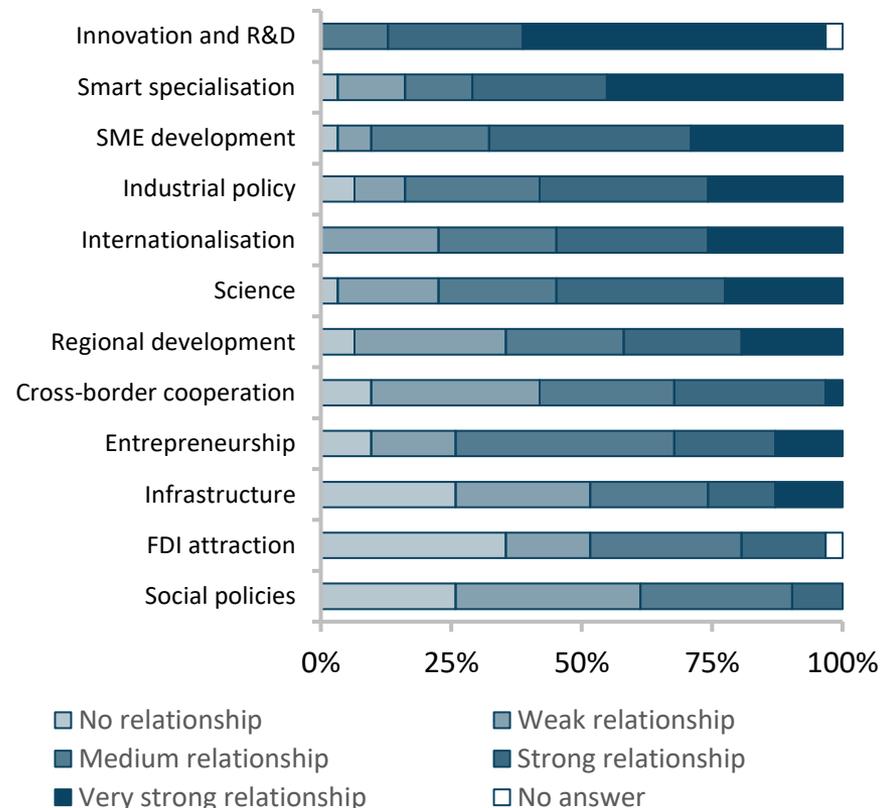
- Commonly, the structure of cluster management organisations, which often have the legal form of an association, comprises the elements:
    - Cluster board (representatives from business, academia, government) providing guidance
    - Cluster management for the day-to-day operations (on average 3-5 employees)
    - Thematic working groups to involve members and develop concrete projects
  - In addition to membership-based models, open approaches are used offering services to all regional actors in the relevant industries
  - Often, the cluster management is hosted by an existing organisation to generate synergies
- Practical example: Chemical and Plastics Cluster Brandenburg (Germany)*
- The cluster management (4 employees) is hosted by the development agency of the federal state
  - Without a formal membership, close to 600 companies – large corporations such as BASF and SMEs – and 20 universities and R&D institutions can benefit from cluster activities focusing on:
    - Innovation and technology transfer (e.g. cooperation platforms)
    - Development of investment sites (e.g. integration of renewable energy)
    - Skills development (e.g. campaigns to attract female employees, adjusting training programmes)
    - Internationalisation (e.g. joint participation in trade fairs)
    - Cluster marketing (e.g. newsletter, cluster stories, podcasts and videos)

## 4. Cluster policy tools – dimension cluster environment

Finally, modern cluster policies follow an integrated approach aligning related policy tools to create a conducive environment for the development of clusters

- Cluster policy has a cross-cutting character with interfaces to several policies and programmes
- In EU countries, cluster programmes are most strongly related to the areas innovation, smart specialisation and SME development
- In transition countries outside Europe, in addition, policy tools in the following areas are commonly used to support the development of clusters:
  - Industrial infrastructure (e.g. specialised free economic zones)
  - Education and training
  - Investment attraction

*Relation between national cluster programmes and other policy areas*



Source: European Observatory for Clusters and Industrial Change 2019

# 5. Lessons learnt

**Although different contexts call for different set-ups and policy packages, some general conditions can be identified that should be considered when designing and implementing cluster policies and corresponding programmes**

## Targeted approach

- Support should not be spread too thinly funding large numbers of widely varied clusters without a sufficient regional concentration and balanced mix of players with related activities and interests
- Financial and technical assistance should be focused on strategic clusters with a critical mass in line with the objectives of the national policy and strategic framework

## Evidence-based approach

- Measures should not focus on creating clusters from scratch based on wishful thinking and following growth and technological trends without reflection
- The cluster potential should be thoroughly analysed reflecting both the existing specialisation and opportunities to diversify into emerging industries and to develop related value chains

## Cooperative approach

- Participation in cluster initiatives cannot be enforced and should not come with any obligations, e.g. in terms of supplying products or services to other cluster members
- Cluster initiatives are based on the principle of voluntary participation and require trust and close collaboration between government, academia and the business community throughout the entire life cycle

## 5. Lessons learnt

**Although different contexts call for different set-ups and policy packages, some general conditions can be identified that should be considered when designing and implementing cluster policies and corresponding programmes (cont.)**

### Integrated approach

- Cluster policy should not be designed nor implemented in isolation
- Synergies with related policy areas such as internationalisation, innovation, industrial infrastructure, SME and skills development should be fully utilised
- Efficient intra-governmental and cross-organisational coordination constitutes another key success factor in this context

### Long-term approach

- Success will neither come automatically nor overnight
- Designing and implementing cluster policy is a complex task which requires strong cooperation and coordination skills as well as structured and consistent procedures
- It can take a considerable amount of time (e.g. five to ten years) before cluster policy takes full effect

### Phased approach

- Considering the complexity of cluster policy, it does not seem promising to roll-out a large-scale programme involving a wide range of clusters at once
- A phased approach including a test phase with a limited number of regional clusters allows to gather valuable practical experience and to refine the policy package accordingly

# About the German Economic Team



Financed by the Federal Ministry for Economic Affairs and Climate Action, the German Economic Team (GET) advises the governments of Ukraine, Belarus, Moldova, Kosovo, Armenia, Georgia and Uzbekistan on economic policy matters. Berlin Economics has been commissioned with the implementation of the consultancy.

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