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## List of abbreviations

BSC	Balanced Scorecard approach
B2B	Business-to-business
CGE	Computable General Equilibrium
ECCP	European Cluster Collaboration Platform
ESCPs	European Strategic Cluster Partnerships
ESCP-S3	European Strategic Cluster Partnerships for Smart Specialisation Investments
ESCP-4i	European Strategic Cluster Partnerships for Going International
ESCA	European Secretariat for Cluster Analysis
GDP	Gross domestic product
EU	European Union
HEI	Higher Education Institution
ICT	Information and Communications Technology
I-O	Input-Output Model
KPI	Key performance indicator
M&E	Monitoring and evaluation
NPO	Network Policy Outcomes
R&D(&I)	Research and Development (and Innovation)
RI	Results and Impact
RO	Result-oriented
ROM	Result-oriented monitoring
RTO	Research Transfer Organisation
SC	Social Capital
SMART	Specific, Measurable, Actionable, Relevant, Time-bound
SME	Small and Medium Enterprise
SNA	Social network analysis
TCICEWG	TCI Cluster Evaluation Working Group

# 1 INTRODUCTION

This Smart Guide is addressed to policy makers and cluster managers engaged in cluster policy making who are interested in monitoring and evaluating the impact of their policies. The objective is to provide them with easy access to knowledge material of high practical value and sound methodological underpinnings, available in a concise and easy to read manner. It thus complements the Smart Guide Cluster Policy published by the European Commission (2016)<sup>1</sup> that had already advocated monitoring and evaluation as a strategic tool for the implementation of cluster policies and programmes.

Monitoring and evaluation are important dimensions of any public policy and of cluster policy in particular. Organising a structured and continuous policy learning process is necessary to deal with the inherently complex and evolving nature of clusters to which no standardized definition applies. Clusters require flexible approaches to understand the advantages they can bring about, their limits, and the kind of support they need. In this context, monitoring and evaluation (M&E) have the important role of fostering continuous learning to improve the cluster policy process.

The Smart Guide needs to overcome two challenges:

- 1) Cluster policies are difficult to monitor and evaluate. Clusters are complex systems relying on **formal and non-formal interactions** and they are associated with quantitative as well as qualitative benefits such as knowledge spill-overs or collaborative dynamics, which are not easy to identify and measure.
- 2) Clusters and the policies designed to support them can take many different forms. **No simple one-size-fits-all recipe** applies. Therefore, this guide covers a large number of different situations while providing sound guidance that is valid across a wide range of scenarios.

To deal with these challenges, the Smart Guide identifies a general framework and highlights different possible options within this framework. It describes the approaches necessary to customise general principles and adapt specific

tools to individual cases. Many **practical examples** are provided to illustrate broad principles, show how to enforce them concretely through specific arrangements, and to demonstrate results of cluster policies. Annex B lists three additional good practices with unique evaluation designs.

Overall, the ambition of this Smart Guide is to identify common ground, to develop effective approaches to cluster policy evaluation within a unified framework and, ultimately, to improve policy making in this area. The objective is to encourage cluster policy-makers and cluster managers to make the best of monitoring and evaluation as a **strategic learning tool** to improve their policies and action plans.

This guide is structured in the following way: it starts by proposing a general framework for monitoring and evaluating cluster policies. It then reviews two specific cases: monitoring cluster organisations and cluster partnerships and it explores possible options for evaluating cluster policies. The Smart Guide eventually identifies a series of principles and **six Do's and Don'ts** to follow when establishing a customised monitoring and evaluation plan.

In drafting this Smart Guide, the authors benefited from substantial input from some stakeholders in particular Madeline Smith, James Wilson and Emily Wise from the TCI Cluster Evaluation Working Group and Anastasiia Konstantynova from Steinbeis Zi. Their contribution is gratefully acknowledged.

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<sup>1</sup> Available at <https://op.europa.eu/en/publication-detail/-/publication/e1fb9f84-2ba9-11e6-b616-01aa75ed71a1/language-en>

# 2 INTEGRATING MONITORING AND EVALUATION IN THE CLUSTER POLICY SETTING

A first necessary step in the provision of a general monitoring and evaluation framework for cluster policy is to agree on a common vision of clusters and cluster policy development, and where monitoring and evaluation fit in the cluster policy setting. This chapter clarifies the terminology that will be used throughout this guide.

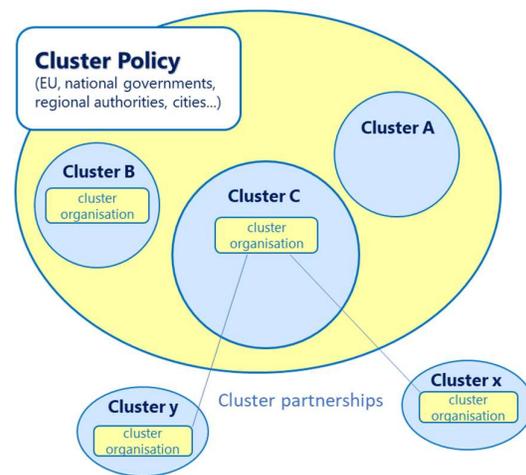
## 2.1 The cluster policy setting

Different actors and stakeholders compose a cluster policy setting. Figure 1 distinguishes between:

- **Clusters and cluster initiatives**, depending on whether they correspond to (“spontaneous”) regional agglomerations of firms and other related economic actors or whether they are the object of an organised policy effort to support their development.<sup>2</sup>
- **Cluster organisations**, which can be supported by cluster policy, and which are, in this case, intermediaries in charge of coordinating and bringing together clusters members for example by promoting joint projects or joint activities. Cluster organisations can but must not be a constituent feature of clusters, which may also result from a spontaneous agglomeration of firms without their interactions being managed (see Figure 1).
- **Cluster policy (or cluster programmes)** providing direct or indirect support to a set of cluster initiatives and their members.<sup>3</sup>
- **Cluster partnerships**, which can be supported by cluster policy in order to strengthen cluster collaborations across regions and sectors. The participating cluster

organisations can pool resources and knowledge with a view to working on joint strategies and common actions.

Figure 1. Cluster policy setting



Source: Authors

### 2.1.1 Intervention logic

A second building block that has to be clarified concerns the intervention logic(s) underlying the cluster policy process. In general, clear logic of intervention is a requisite for policy effectiveness, which also greatly facilitates and improves the effectiveness of policy monitoring and evaluation.

<sup>2</sup> Clusters are “geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions ... in particular fields that compete but also cooperate.” (Porter, 1998) “Cluster initiative: an organised effort to increase the growth and competitiveness of a

cluster within a region, involving cluster firms, government and/or the research community”. (Sölvell et al., 2003)

<sup>3</sup> “Cluster policy can be understood as a wider set of specific government policy interventions aiming at strengthening existing clusters or facilitating the emergence of new ones.” (European Commission, 2008)

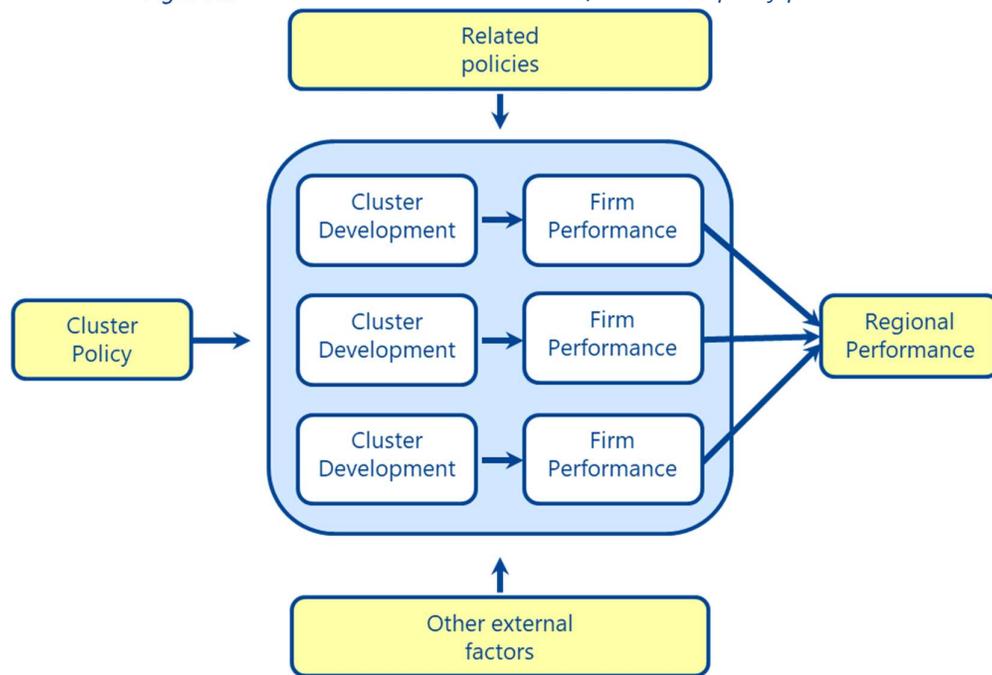
For cluster policy, in particular, drawing up an explicit intervention logic is not an easy task. This is because cluster analysis is not amenable to the identification of simple causal relations as the advantages associated with clusters stem from systemic relations between cluster members, knowledge spill-overs and other material and immaterial linkages (Aranguren et al., 2014).

However, as for any policy, an effort should be made to clarify the **problems** that clusters are expected to address and to identify the **measures** through which they are to address these problems. In the case of cluster policy, such an intervention logic may refer to **specific objectives** such as strengthening industry-science relations, facilitating technology transfers, and supporting internationalisation.

Too general objectives like increasing competitiveness, make the monitoring and evaluation exercise more difficult (this specific issue is addressed in Section 5).

Figure 2 proposes a schematic representation of the cluster policy process. Cluster policy is expected to improve cluster development, which impacts positively on firm performance and brings about a broader impact at regional level. Cluster policy developments should be considered within a wider policy-making context, that includes other related policies and external factors (e.g. exogenous shocks) influencing the way in which policy inputs effectively translate into (expected and/or unexpected) effects and reach policy objectives towards driving regional economic performance (e.g. growth, innovation, jobs).

Figure 2. Transmission channels of the cluster policy process



Source: Authors adapted from Schmiedeberg, 2010.

One way to account for the intervention logic underlying the cluster policy process is to resort to the distinction between different types of effects caused by public policy commonly used in the context of monitoring and evaluation (Organisation for Economic Co-operation and Development et al., 2002):

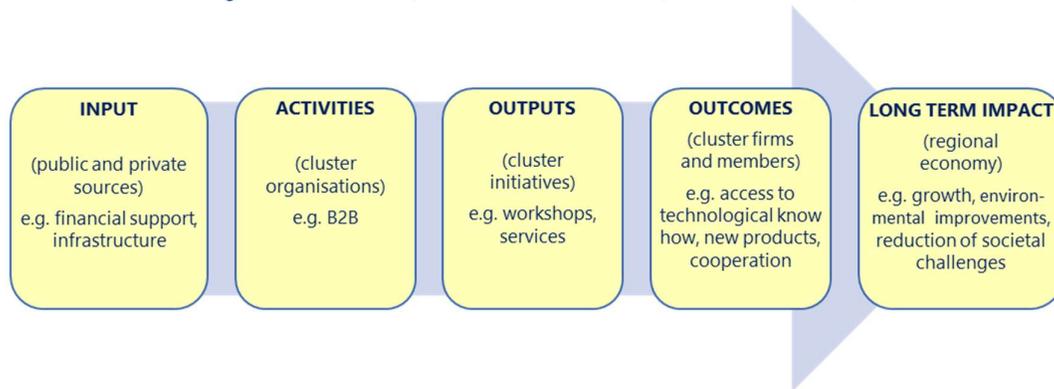
- **Input** - originates from public authorities (EU, national governments, regional authorities) and private sources in varying proportions and forms. It includes financial, personnel and other resources that are invested by the policy (e.g. in the case of cluster policy, collective actions

by cluster organisation, cooperation projects, framework conditions).

- **Activities** - by cluster organisations acting as intermediaries for its firms and other cluster members (and also as a source of policy input).
- **Output** - encompasses immediate measurable results stemming from activities, generally materialising at the level of cluster initiatives.

- **Outcome** - defines the medium-term consequences corresponding to the aim pursued by the policy and are measured at the cluster members level.
- **Impact** - represents wider long-term effect or influence they are mostly found at the more macro or aggregated level of the regional economy (see Figure 3)

Figure 3. High-level intervention logic of cluster policy



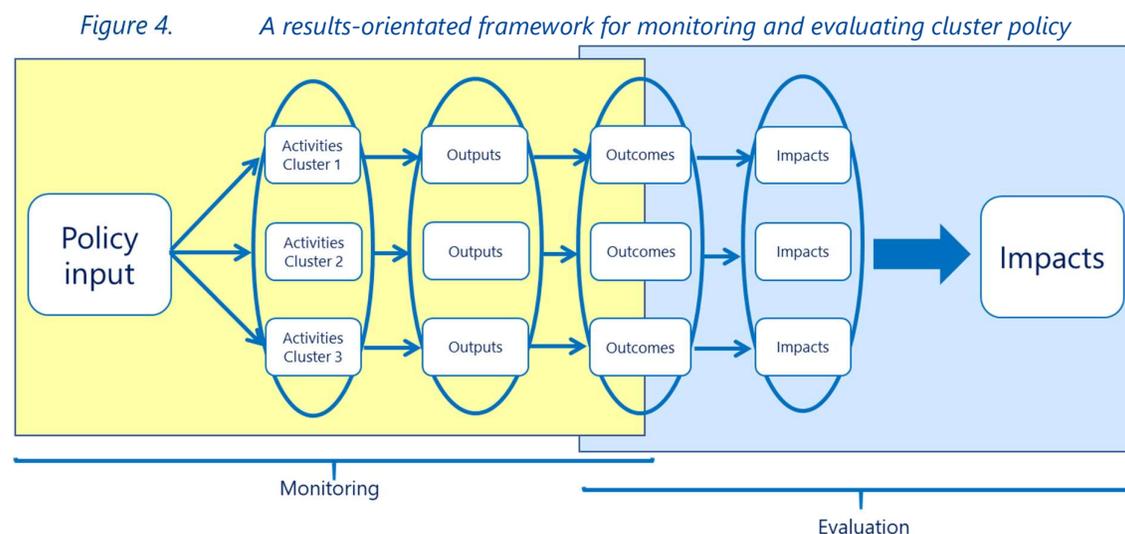
Source: Authors

This overall intervention logic applies at the level of cluster policy and needs to be broken down into separate intervention logics at the level of individual clusters. In principle, each cluster belonging to the same cluster policy or programme broadly share the same intervention logic. In practice, objectives and expected results can differ slightly at cluster level, and the means to achieve them can differ even more. While long-term effects should converge, it can happen that clusters under the same policy or programmes have different

agendas and pursue distinct (but complementary) strategic objectives. Particularly in the case of cluster policy, this framework needs to be applied flexibly to make room for the wide diversity of cases. Chapter 3 will show that a “balanced scorecard” approach can be an alternative approach to the rather linear causal relations presented in Figure 3 above.

## 2.2 Monitoring and evaluation

In the framework adopted in this Smart Guide, monitoring and evaluation are not disconnected activities, as illustrated in Figure 4 below. They are rather to be seen on a continuum and contribute to the same process. They are linked together through “result-oriented monitoring”, which provides an overall long-term framework reflecting the cluster policy intervention logic.



Source: Authors

The first part of the policy process includes policy input, activities and outputs, which are the primary domain of monitoring. Evaluation is more concerned with the latter segment of the policy process, looking at how outcomes and impacts address overall societal needs and the policy's objectives. **Result-oriented monitoring (ROM)** establishes the link between the two in a continuum.

- *Monitoring* mostly serves policy implementation and informs management. It involves the regular collection and reporting of information that enables cluster managers and policy makers to determine whether planned output and schedules have been reached and to take appropriate corrective actions; it helps stakeholders understand the outputs of their efforts. (Inno Germany AG, 2010; United Nations Industrial Development Organization, 2012).
- *Result-oriented monitoring* helps shift the attention away from implementation issues to mid and long-term results and impacts. ROM provides a set of useful data on

programme processes and results that can be used for effective evaluations, reducing the weight of *ad-hoc* data collection. Result-oriented monitoring contributes to the formulation and implementation of sound intervention logics, and as such, ROM is an integrated part of the monitoring and evaluation framework, (Inno Germany AG, 2010; Scheer and Von Zallinger, 2007).

- *Evaluation* serves policy makers, questioning the need for new or better policy. It develops on the basis of data and evidence provided through ROM but involves specific analytical efforts, at a given point in time, and tries to answer questions about the performance of programme activities that support policy making, and about why and how this performance is recorded.

While bearing in mind that both are linked by result-oriented monitoring, the main “ideal type” **differences between monitoring and evaluation** include the following:

- *Objectives*: while monitoring tracks progress and deviations that may call for immediate correction, evaluation aims to generate longer term learning;
- *Periodicity*: monitoring is a continuous and iterative activity during implementation; evaluation provides a snapshot at a single point in time, usually mid-way through implementation and/or at the end of the implementation period;
- *Ownership*: monitoring is often done internally, whereas evaluation is generally carried out by external independent experts.

## 2.3 Specific challenges

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This Smart Guide aims at providing an overall monitoring and evaluation framework (M&E) adapted to clusters and cluster policy. Standard M&E practices do not account for the multi-faceted dimensions of cluster developments. In particular, they are often not well equipped to

capture the specificity of clusters and cluster policies in terms of collaborative dynamics, which are so important in determining the performance of cluster firms. Specific approaches and tools are therefore needed to account for intangible effects on social / relational capital, as opposed to structural capital that includes people, money and various types of infrastructure (Wise and Wilson, 2017).

Providing a common framework accounting for all the different possible shapes and content of cluster policies, as already hinted, is also challenging. This framework should make possible tailored approaches to accommodate the specific objectives and unique circumstances that contribute to the great heterogeneity of cluster programmes and policies. In addition, this framework should distinguish between M&E at the level of the cluster organisation and at the level of the cluster policy, since the two are different but need to be aligned.

# 3 A RESULT-ORIENTED MONITORING FRAMEWORK APPLIED TO CLUSTERS AND CLUSTER POLICY

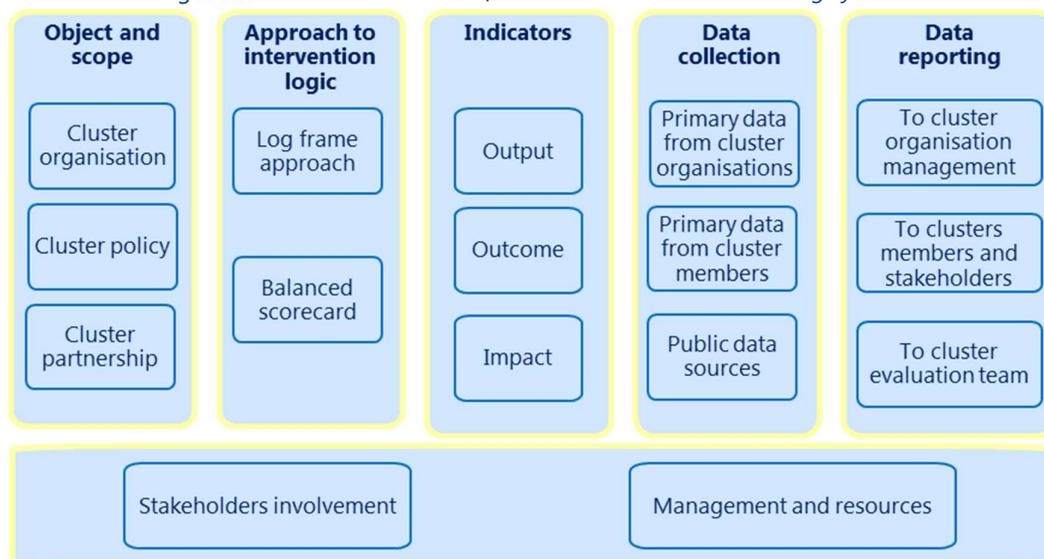
This chapter describes a very important prerequisite for developing successful monitoring and evaluation activities in the field of cluster policy: establishing a “result-oriented monitoring” framework (ROM). Such a framework stretches from policy input down to expected impact and reflects the intervention logic of a cluster policy or programme. As such, it is an approach turning monitoring and evaluation into an effective and strategic learning process.

## 3.1 Overview

This section shows how to establish a general result-oriented framework on the basis of successful monitoring and evaluation of clusters and cluster policy. This framework is valid at the overall cluster policy level, and at the level of

individual clusters. The different dimensions to consider when developing such a framework are schematically represented in Figure 5 below and further detailed in the following sections.

Figure 5. Dimensions of a result-orientated monitoring system



Source: Authors

## 3.2 What is being monitored and evaluated?

Since clusters involve multiple activities and actors, the monitoring process can happen at different levels and focus on different activities or subjects. Therefore, it is necessary to first

define what should be monitored and who should provide feedback, at which levels and under what form. It shows that monitoring activities are not just codified and quantitative, but they can also take place on the basis of exchanges of qualitative and tacit knowledge through more or less formal processes. In

addition, Table 1 distinguishes between different objects of monitoring (i.e. what is being monitored), namely: cluster organisations (and their cluster management), specific activities undertaken by participants in cluster initiatives, and cluster policies consisting of the support provided by the regional, national or

the EU level. The latter support can be general- and/or more targeted, e.g. on cluster partnerships. Clusters as the (spontaneous) regional concentration of interlinked firms can also be monitored by quantitative or qualitative methods.

*Table 1. Level of cluster policy monitoring, and corresponding evidence*

Type of evidence	Cluster organisation (management team)	Participants in cluster initiative	Cluster policy support programme/project (EU, national, regional government)	Cluster as regional statistical entity
Qualitative (Tacit knowledge)	Weekly staff meeting	Meeting with all involved in a specific activity: e.g. a research project, a new training activity, a partnership with another cluster	Briefing to government on the subsidised cluster activity; e.g. for setting up a demonstration, acceleration, competence, and/ or financial instrument	S3, entrepreneurial discovery event, discussing current and future trends, challenges
Quantitative (Codified knowledge)	Bronze, silver, gold label in cluster excellence	Collect data, reporting on initiated activities	Collect, reporting pre-defined indicators to government	Regional Cluster scoreboard; regional NUTS 3 data, statistical benchmarking

*Source: Authors based on Nauwelaers and Wintjes, 2008.*

Information collected through monitoring at these different levels is useful from essentially two main perspectives: that of the cluster managers who coordinate activities addressed to cluster members at the level of a single cluster initiative, and that of the policy maker in charge of cluster policy or programme targeting a set of cluster initiatives. Of course, the two perspectives must coincide, and monitoring at the level of single cluster initiatives should feed into the wider monitoring of cluster policy. This, in turn, is made possible when intervention logics at these different levels are compatible and mutually reinforcing.

### 3.3 Choices to formulate an intervention logic

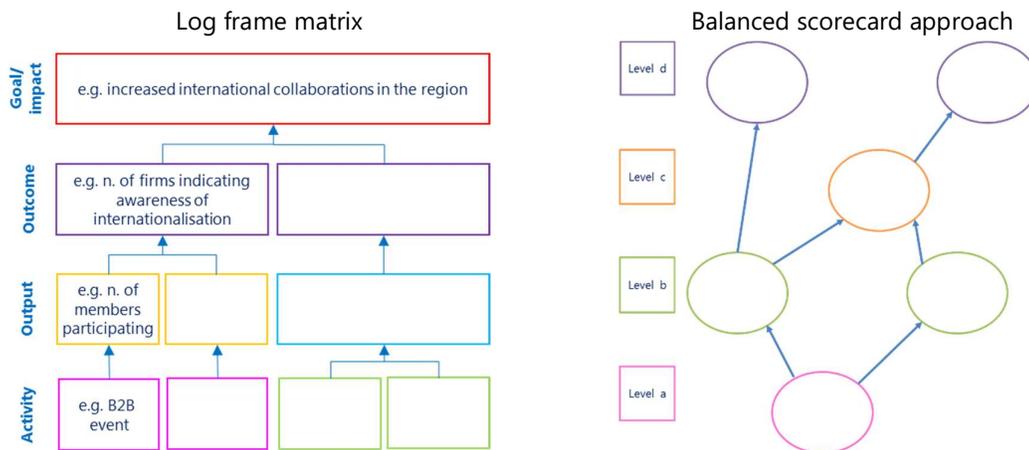
Two approaches that can be utilised to formulate an intervention logic are log frames and balanced scorecards. Their aim is to ensure that the short and long-term objectives of an organisation or a policy are met. They are used to **convert strategic goals into metrics** that can be measured, monitored and

communicated, based on different ways to organise information. These approaches increase the focus on strategy and results.

While formulating an intervention logic is a prerequisite for the correct functioning of a monitoring system, using log frame or balanced scorecard approaches may contribute to formulating an explicit and convincing intervention logic at both cluster organisation and policy levels. Both the log frame approach and the balanced scorecard are reduced version of the intervention logic (Figure 6).

A **log frame approach** emphasises the linear relations between different levels of effects and tends to focus on a single stream of relations achieving one main objective. Log frame matrixes give a detailed description of a programme/policy, showing how the programme activities will lead to the immediate outputs, and how these will lead to the outcomes and goal/impact (in Figure 6, some examples are given, taken from the Walloon experience described in Box 7).

Figure 6. Two monitoring approaches compared



Source: Authors

A **Balanced Scorecard** (BSC) is a wider representation of the policy's or programme's theory of change, which includes a larger range of external and internal factors and expected causations. In a BSC approach, different objectives coexist at different levels in a *balanced* and less hierarchical way (a full example from Lower Austria is provided in Figure 7).

The choice between the two approaches depends essentially on the underlying intervention logic. It can be argued that a *log frame approach* is especially appropriate for monitoring policies, as it proposes a simple framework focusing on the eventual expected impact, which is of interest to policy makers. A *balanced scorecard approach* might prove particularly adequate for monitoring at the level of cluster initiative(s)/organisation(s).

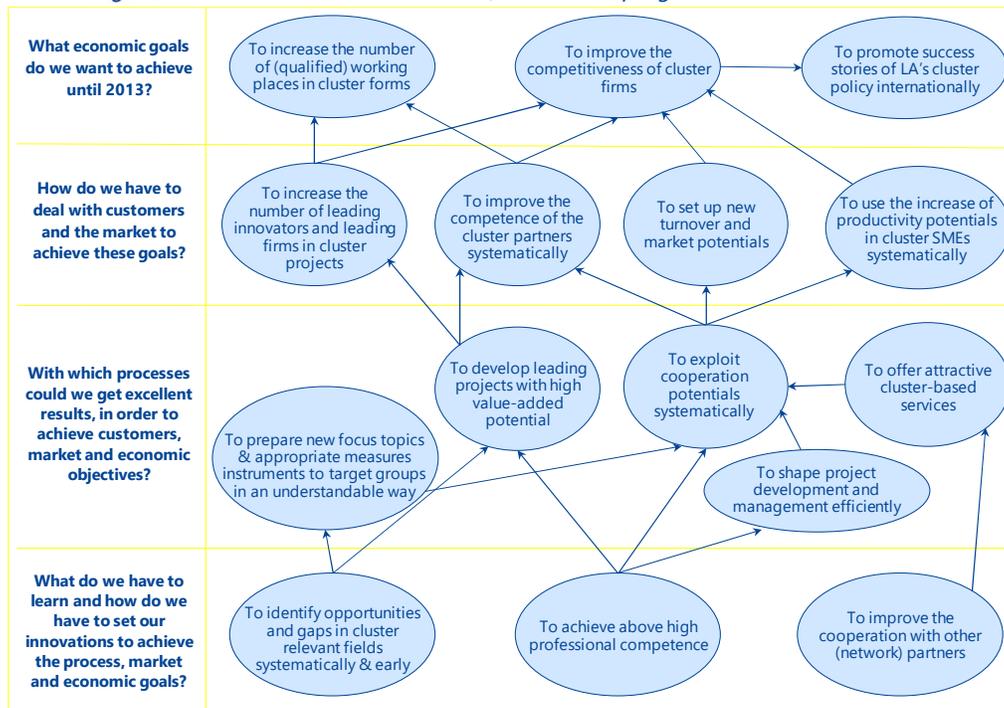
The advantage of BSC is that it gives comparable ("balanced") weight to different but complementary objectives. This can be an asset for the practitioner perspective, where cluster managers must deal with many different stakeholders that are confronted by diverse frameworks of constraint and opportunities and pursue different yet complementary objectives.

The original version of the BSC (first developed as a strategy management tool for the private sector) covered perspectives / dimensions considered to be of primary importance in the context of corporate development (i.e. financial, customer, internal business, innovation and learning). These dimensions can be adapted to the case of public policy (European Commission et al., 2013) and specific **dimensions of a balanced scorecard for cluster policy** could include the following:

- Cluster organisation management;
- Cluster support services;
- Collaborative projects; and
- External partnerships (i.e. partnerships with other clusters outside the own region).

Eventually, the policy log frame and the cluster BSCs must coincide, in other words, the cluster BSCs should feed into the cluster policy log frame. A BSC approach at the level of a cluster initiative must include indicators that flow into the monitoring process at the policy level. These indicators are common across the cluster initiatives covered by the cluster policy (this point is further elaborated below in section 3.4.3 on "Which indicators for which level of monitoring?").

Figure 7. *Balanced Scorecard for a cluster programme in Lower Austria*



Source: (Lämmer-Gamp et al., 2012) and <http://www.scinnopoli.eu/Results.html>

### 3.4 Which indicators should be selected?

Key performance indicator (KPI) populating the monitoring system should be defined in tight accordance with the underlying logic of intervention as reflected in the log frame or BSC. They should respond to a clear vision of what should be achieved and who is concerned.

#### 3.4.1 Different types of indicators

From the perspective of monitoring, indicators are mostly limited to account for input and output, describing resources invested and activities carried out. Input, output/process indicators, generally relate to the operational activities of cluster organisations used to check whether implementation is proceeding as planned (procedural effectiveness). In a result-orientated monitoring perspective, the monitoring process also relates to outcome, and beyond, to the impact of cluster policies on

regional growth, regional innovation, knowledge creation, organisational learning and regional structural change.

Indicators can be grouped in **different indicator categories**. For example, many indicators commonly used fall broadly within categories that correspond to an area that contributes to forming a supportive environment: financial capital, human capital, intellectual capital, market capital (internationalisation and global attractiveness), physical capital, social capital (networks and partnerships).<sup>4</sup> A comparable classification is provided by the “regional ecosystem scoreboard”<sup>5</sup>, which distinguishes between knowledge basis, access to finance, collaboration, internationalisation, demand conditions, entrepreneurial conditions, and quality of governance. Table 2 presents the concrete example of a **set of indicators** typically used in cluster policy monitoring and evaluation.

<sup>4</sup> See E. Wise in (Sölvell, 2009).

<sup>5</sup> [https://ec.europa.eu/growth/industry/policy/cluster/observatory/regional-ecosystem-scoreboard\\_en](https://ec.europa.eu/growth/industry/policy/cluster/observatory/regional-ecosystem-scoreboard_en)

Table 2. Overview of indicators commonly used in cluster policy monitoring and evaluation

ELEMENTS OF DIRECT/BEHAVIORAL EFFECTS	EXAMPLE INDICATORS
Collaboration and collaborative dynamics	<ul style="list-style-type: none"> <li>• Engagement of different actor groups (level/critical mass and diversity)</li> <li>• Linkages and dynamics of linkages between actors over time (number and types of collaborations)</li> <li>• Capacity to collaborate</li> </ul>
Innovation and innovative capacity	<ul style="list-style-type: none"> <li>• Competence development of staff</li> <li>• Knowledge exchange (between companies and universities/other actors)</li> <li>• Capacity to innovate; collaborative research and innovation projects</li> <li>• Introduction of new products/services</li> </ul>
ELEMENTS OF INDIRECT EFFECTS	EXAMPLE INDICATORS
Competitiveness and international attractiveness	<ul style="list-style-type: none"> <li>• Entrepreneurship; new companies</li> <li>• Attraction of investment or talent</li> <li>• Entry into new markets</li> </ul>
Firm-level economic performance	<ul style="list-style-type: none"> <li>• Revenue growth</li> <li>• Productivity growth</li> <li>• Employment growth</li> <li>• Export growth</li> </ul>
System level	<ul style="list-style-type: none"> <li>• Broader spill over effects on the region (e.g. regional GDP growth, resilience/capacity for transformation)</li> <li>• Changes to regional/national innovation system or policies</li> </ul>

Source: Wise et al. (2017)

### 3.4.2 Which indicators for capturing social capital?

One specific issue in the case of cluster policy is to have indicators that cover the whole range of expected effects, in particular, qualitative and intangible effects such as social capital, trust, linkages, networking and relationships. For instance, the European and Regional Innovation Scoreboards include an indicator on “Innovative SMEs collaborating with others”.<sup>6</sup> Another possible indicator could be “increased collaboration between firms or between firms and research organisations” in view of measuring a behavioural change.

However, measuring linkages by the number of cooperative agreements does not capture the intensity, quality or success of that cooperation. Attempts must be made to quantify or standardize the qualitative information, even

when there is no standardised definitions or indicators available to measure qualitative information. Specific data collection tools can be adopted to mitigate this issue (see Section 3.5).

### 3.4.3 Which indicators for which level of monitoring?

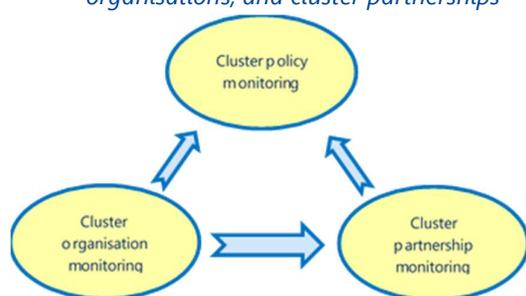
The choice of indicators depends to a high extent on the monitoring level and its object. *Indicators for monitoring* are most relevant at the level of cluster organisations, while *indicators for evaluation* are interesting from a cluster partnership or a cluster policy perspective. In result-orientated monitoring, these sets of indicators overlap.

Monitoring at the policy, cluster organisation and cluster partnership levels are related and, thus, can influence one another’s approach and the required monitoring indicators. The cluster

<sup>6</sup> [https://ec.europa.eu/growth/industry/innovation/facts-figures\\_en](https://ec.europa.eu/growth/industry/innovation/facts-figures_en)

organisation monitoring indicators should align with some, if not all, of the cluster partnership indicators. Both the cluster organisation monitoring indicators, and the cluster partnership monitoring indicators should feed into the policy monitoring process. Therefore, the cluster policy monitoring process could acquire indicator data through either the cluster organisation monitoring process, the cluster partnership monitoring process, or both.

*Figure 8. Flow of results between the monitoring of cluster policy, cluster organisations, and cluster partnerships*



*Source: Authors*

### 3.4.4 How to select indicators

If the log frame approach is applied to monitoring policy, the following steps should be taken to identify **key performance indicators (KPIs)**:

- 1) Confirm the policy objectives.
- 2) Identify or confirm the expected outcomes per objective (policies normally have expected outcomes or influences towards outcomes).
- 3) Define appropriate indicators to determine whether each outcome is achieved.

It is important that each objective has its own set of expected outcomes in the second step. Similarly, each outcome should have its own set of indicators in the third step.

Sticking to the policy/cluster log frame is the principal quality criterion for selecting indicators. In this respect, a **participatory approach** that involves relevant stakeholders is crucial. This approach helps to identify pertinent indicators linked in causal relations (i.e. that outputs translate into outcomes, which contribute to expected impacts) and it makes

possible the alignment of different objectives (at different levels of governance, or across clusters, for example).

A participatory approach also ensures **ownership** of the process by those concerned and whose contribution is essential. The willingness of stakeholders to share information for monitoring purposes is necessary, and the perceived utility of the exercise is one important incentive for cluster members to participate and release quality information.

To the extent possible, it should be **predefined** what information should be collected to avoid requesting extra data and to ensure the required data exists. This should be done during the development of the policy or at the early implementation stage. However, in a “developmental approach” to monitoring and evaluation, there should also be room for introducing new indicators as needs evolve (see Chapter 4).

KPIs should not be too broad or general but precise and few in number to optimise the monitoring efforts and the quality of the information (United Nations Industrial Development Organization, 2012). Indicators should follow the **SMART criteria**, i.e. be Specific, Measurable, Actionable, Relevant, and Time-bound.

### 3.4.5 Baselines and targets

Once the set of KPIs has been established for each expected outcome, it is necessary to put in place baselines and targets per indicator. In other words, what is the measurable indicator value required to determine whether the outcome has been achieved? In most cases, the **baseline** is established by the indicator value at a specific time. The time is normally a date prior to the policy being established or having influence on the cluster community. With regard to indicator target values, this is more subjective and quite often determined through a participatory approach. The relevant stakeholders should be involved in the process to encourage ownership of the policy and its outcomes, and to ensure that **realistic and**

**credible targets** are established. The established targets are highly dependent on the specific indicator, the expected change of the indicator value over the policy period if the policy were not implemented, and the incremental change in the value that is expected due to the policy's influences.

The target should be an outcome, but it should also set a deadline for this outcome to be achieved. It can be expressed in *absolute terms* (e.g. attract 500,000 EUR in extra private sector funding) or in *relative terms* (e.g. increase firm-level innovation expenditure by 20% within 5 years).

Achieving targets should not acquire disproportionate importance as cluster policy is characterised by imperfectly predictable outcome. On the contrary, identifying baseline values is important, in a context where counterfactuals are hard to identify.<sup>7</sup> Table 3 gives an example of a template to record performance against a specific case of key performance indicators.

*Table 3. Template to record performance against a specific key performance indicator*

INDICATOR	Example
Definition	Introduction of new products/services
Purpose	Assess innovation performance
Baseline	14 (at t0)
Target	21 (at t0+ 1 year)
Data Collection tool	Survey
Frequency	Bi-annual
Responsible	Cluster organisation
Reporting	Cluster members and stakeholders
Quality Control	Cluster organisation

Source: Authors, based on [www.tools4dev.org](http://www.tools4dev.org)

Table 4 shows a specific example of targets used ex-ante in Hungary. They are indicators associated with revised thresholds used for **selecting clusters for a labelling process**, which represented a shift from assessing the economic impact to focussing on the intensity of cooperation and cluster management. They

are applied after the following eligibility criteria and those indicated in square brackets [\*].<sup>8</sup>

- a minimum of 20 members, of which a minimum 15 since 2 years;
- a minimum ratio of 75% of SME members; and
- an average added-value per capita of 10.000€ per SME member.<sup>9</sup>

*Table 4. Indicators used in the Hungarian cluster accreditation system*

INDICATOR	Max. score
<b>Cooperation inside the cluster (max 20 pts)</b>	
N. of years passed since foundation of cluster [ <i>*min. 3 years</i> ]	7
N. of events and meetings in past 2 years	8
N. of press and media releases in past 12 months [ <i>*min. multilingual website/key info</i> ]	5
<b>Cluster management &amp; composition (max 30 pts)</b>	
N. of years the current cluster organisation has started to manage the cluster [ <i>*min. 1 yr</i> ]	6
Costs paid by members to the cluster for the operation of the cluster [ <i>*80€ per month by 80% of members</i> ]	7
Ratio (%) of members since more than 3 yrs	7
At least 50% of members have their seat in the same county as the cluster organisation	4
The cluster organisation provides at least 1 service among incubation, mentoring coordination of dual training, suppliers programmes.	6
<b>International focus (max 24 pts)</b>	
N. of supported international projects	6
Ratio (%) of export-oriented SMEs	6
N. of international events attended by at least 2 members	6
Any ESCA cluster excellence label?	6
<b>Innovation potential &amp; performance (max 26 pts)</b>	
N. of cluster projects which generated at least 160.000 euro in the past 5 years	8
Ratio (%) of members having implemented at least 1 R&D&I project since 2007	7
N. of Intellectual Property Rights (IPR) owned by SME members	6
At least 1 Higher Education Institution (HEI) as member for at least 1 year?	5
<b>TOTAL</b>	<b>minimum threshold 50/100 pts</b>
(for renewal minimum threshold 60/100 pts)	

Source: Keller (2018)

<https://ec.europa.eu/docsroom/documents/31487>

<sup>7</sup> See "Designing Cluster Evaluation" by TCI Working Group on Evaluation, available from <https://issuu.com/tcinetwork/docs/clusterevaluationbooklet>

<sup>8</sup> These are partly based on the indicators of the European

Secretariat for Cluster Analysis (ESCA). See Section 4.1.1.

<sup>9</sup> Added value = profit before tax + depreciation and amortization + staff costs/average headcount

### 3.5 Data source and data collection

The data collection for result-orientated monitoring and evaluation differs depending on the indicators chosen. *Process and output indicators* related to the operational activities of the cluster organisation can be populated with primary data that is collected systematically (e.g. record keeping, direct observation). For these indicators, the cluster organisation is thus, in general, the source of information. It must have in place a tracking system to ensure the data is managed and provided periodically as necessary for the monitoring process, for example, on a quarterly or semi-annual basis.

In the case of *outcome and impact indicators*, the source of information is wider and it

includes cluster organisations, cluster members and key stakeholders, member state data sources, and EU data sources. One difficulty with official statistics has to do with the identification of the boundaries of clusters, which do not necessarily coincide with the geographical categories employed by statistical nomenclatures (e.g. regional NUTS level distinction). Another limit of official statistics to account for innovative clusters concerns their imperfect coverage of emerging industries for example, where traditional sectoral boundaries are being blurred.

The **main instruments for collecting data** from cluster members and stakeholders are interviews and surveys (see Box 1), which can be complemented with other sources and tools when necessary (e.g. focus group discussions).

#### Box 1. Interviews and surveys

**Interviews** are widely used to collect qualitative information and opinions from key stakeholders. In general, in-depth semi-structured interviews are preferred, since they are more flexible than traditional directive interviews (with a formalised, limited set of questions). The interviewer asks open-ended questions on the subjects to be addressed and new questions can be brought up during the interview as a result of what the interviewee says

**Surveys** are especially helpful in the case of cluster policy, as they address the direct beneficiaries and make possible to capture the human dimension of clusters, which is so often difficult to measure.<sup>10</sup> Surveys can be administered through an online platform. In the case of cluster policy, in general, the whole set of member firms is included in the sample. A control group of firms not having received support from cluster policy can also be included in the survey.

Online surveys can use closed (dichotomous) questions and multiple-choice questions to process findings in an appropriate way. It is also possible to include open questions, which can be processed individually or through appropriate software. A short and concise questionnaire is preferred. Once answers have been collected, data is processed and analysed with different methodologies, ranging from basic descriptive statistical processing to more far-reaching analyses of correlation and statistical regressions.

Possible **disadvantages or risks** include:

- Limited response rate (e.g. survey fatigue): different follow-up strategies may be adopted
- Selection bias: responses usually reflect the perception and knowledge of the persons answering, so the quality of responses varies. Sending private links that cannot be forwarded is a way to ensure that for each institution/body the most appropriate person responds.

**Mitigation measures** include:

- The survey results are most robust and useful when there is a sufficient number of answers for each type allowing aggregate level analysis.
- It is important to correctly formulate the questions to obtain the necessary information since many KPIs can be addressed both qualitatively and quantitatively.

*Source: Authors*

<sup>10</sup> The TCI Cluster Evaluation Working Group has developed a set of survey questions that can be integrated into a firm level survey as part of an evaluation. It can be

shared, provided track is kept where it is used. See <http://www.tci-network.org/>

These instruments make it possible to collect information that is both qualitative and quantitative. They are useful to collect cluster members' perceptions and assessments of clusters effects on their development.

Data collection should be timely to enable the required data to be obtained and analysed as well as to allow policy adjustments in the next generation of initiatives. The frequency of data collection diminishes along the result-orientated monitoring chain.

Efforts should be made to try and **minimise the burden associated with data collection**. Monitoring should use already available data and reduce the burden of collecting extra data as much as possible. There should be a balance between measuring results accurately and comprehensively and the effort that is associated with in-depth methods of collecting information (Kind and Meier zu Köcker, 2013a). The interaction of the cluster organisation with cluster members to acquire the information can be time-consuming and it should be conducted in an efficient manner. To guarantee a high level of support from the cluster members and key stakeholders, it is useful to take the following approach:

- **Include cluster members and stakeholders in developing the monitoring process** in order to educate them on the importance of the monitoring process and on the need to gain their responses to the cluster organisation's requests in support of the process;
- **Establish a clear and uncomplicated protocol for requesting and receiving indicator information** from the cluster members and stakeholders (e.g. a simple online survey, email form, or email attachment); and
- **Respect the process by meeting the deadlines** for requesting and receiving information.

## 3.6 Reporting

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**Reporting on monitoring** is necessary to take informed corrective actions at management level in the short term. The development of regular written reports to present the cluster's progress to stakeholders should be designed so that cluster stakeholders can easily have access to the results of the analysis and to promote a participatory approach. Reporting to stakeholders in the wider result-orientated monitoring context is an important factor making them become an integral part of what the cluster does.

The availability of a management information system (with a centralised database) is necessary to aggregate data collected from different sources or clusters – and report on it.

## 3.7 Stakeholder involvement

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Identifying the stakeholders and corresponding information needs is one of the most important tasks of the monitoring process. As shown above, the formulation of a sound intervention logic and its translation into a set of indicators and targets requires the active participation of different stakeholders who are part of the cluster policy process. The success of this process depends on the stakeholders' willingness to share information on a systematic basis and to feed it into the data flow.

Table 5 provides an overview of stakeholder roles in the cluster policy monitoring process.

*Table 5. Stakeholders in the result-orientated monitoring (ROM) setting*

STAKEHOLDERS	ROLE IN THE ROM PROCESS
Policy-makers	Make decisions based on the data provided by the cluster stakeholders; impose indicators to be monitored
Cluster managers/ organisations	Provide information about strategic development, establishment of structures and activities; provide data on efforts and activities organised
Cluster members	Provide information about networking, interaction, projects, own performance

Box 2 below provides the example of a monitoring system applied to cluster policy in Denmark, which illustrates the different features addressed in this chapter. Box 3 in the next chapter also reports on its results.

Source: Authors based on Merkl-Rachbauer and Reingruber, 2012

*Box 2. Performance Accounts of innovation networks and clusters in Denmark*

Innovation networks are national clusters within different sectors in Denmark (together with clusters, the most relevant ones are approximately 38 in 2019). Since 2006, they are the object of an annual review tracking their resources, activities and results. The stated objective of these "Performance Accounts" is to present evidence on how much collaboration and innovation has resulted from public (and others') support to the innovation networks. This is done on the basis of the intervention logic below. Each arrow is associated with a series of indicators.



The indicators structure has remained stable over the years to allow for comparisons. Only indicators accounting for internationalisation have been more recently introduced. The information is gathered by means of a questionnaire to innovation networks.

Source: (Danish Agency for Science Technology and Innovation, 2011), [www.fi.dk](http://www.fi.dk), [www.clusterexcellencedenmark.dk](http://www.clusterexcellencedenmark.dk).

# 4 HOW TO MONITOR CLUSTER ORGANISATIONS AND CLUSTER PARTNERSHIPS

This chapter builds on the result-orientated monitoring framework proposed in the previous chapter and applies it in two specific cases: monitoring cluster organisations from a management perspective, and monitoring cluster partnerships.

## 4.1 How to monitor cluster organisations

A monitoring system for cluster organisation allows cluster managers to determine whether the cluster organisation is performing according to the pre-defined plan, mainly regarding human and financial resources while ensuring cluster objectives are being met (Schretlen et al., 2011). This section applies the general guiding principles detailed above to the specific case of cluster organisation monitoring.

### 4.1.1 Building blocks: roadmaps and quality labelling

As described above, a clear intervention logic is a prerequisite for developing a monitoring system. In the case of cluster organisations, this can take the form of a “**roadmap**” spelling out short, medium- and long-term objectives, targets and other organisational and budgetary arrangements. The cluster roadmap is necessarily aligned with the broader cluster policy intervention logic.

In addition, the monitoring of the performance of cluster organisations can, and should be closely linked to the benchmarking indicators

applied by the well-established **European labelling system for Cluster Management Excellence**. Over 1300 cluster organisations across Europe have been benchmarked and received either a Bronze, Silver or Gold Label. The labelling system has been put in place by the European Cluster Excellence Initiative<sup>11</sup> in 2009 with support from the European Commission and is currently run by the European Secretariat for Cluster Analysis (ESCA)<sup>12</sup>. The European Cluster Excellence Associations is being set up with the objective to take over the governance of the labelling system during 2020.

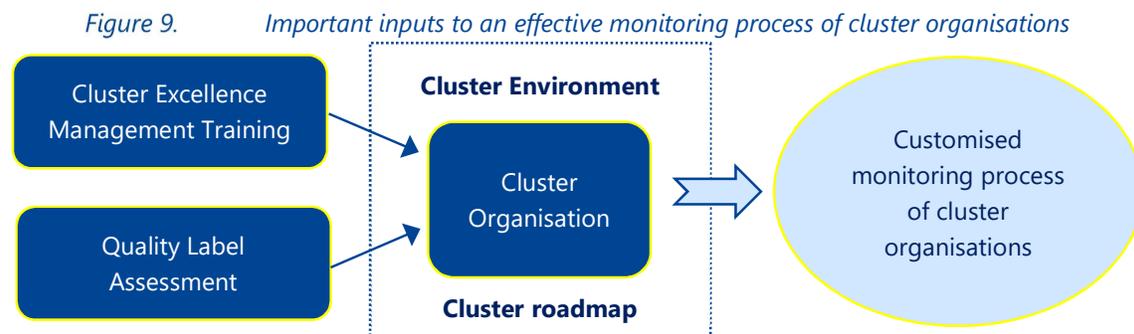
The benchmarking methodology for cluster organisations of the labelling system was set up with the objective to improve the management processes and effectiveness of support services offered to SMEs by cluster organisations. The quality labelling is complemented by training and webinars offered by the European Cluster Collaboration Platform<sup>13</sup> and other entities.

This can have a positive influence on the customisation of the monitoring process of cluster organisations towards a better fit for the particular needs and strategic objectives spelled out in their roadmap (see Figure 9).

<sup>11</sup> [ec.europa.eu/growth/industry/policy/cluster/excellence](http://ec.europa.eu/growth/industry/policy/cluster/excellence)

<sup>12</sup> <https://www.cluster-analysis.org>

<sup>13</sup> <http://www.clustercollaboration.eu>



Source: Authors

#### 4.1.2 Type of information to be collected and suggested indicators

Quantitative and qualitative information should be structured in a metrics system that reflects the intervention logic contained in the roadmap established by the cluster organisation management team. As outlined above, a Balanced Scorecard can be used as part of its monitoring process to make sense of the multiple objectives pursued by the cluster organisation.

This metrics system should be populated by a set of indicators. The emphasis needs to be placed on *quantitative information* to clearly confirm that the objectives of the cluster organisation are being met.

Nevertheless, *qualitative information* is also necessary to provide the cluster organisation management team with indications as to what is working well and what may need to be improved that may not be shown by the quantitative information. For example, an objective related to the provision of a specific service by the cluster organisation may be achieved, or be on the path to being achieved, yet there may be aspects of the service that could be improved, which would not be identified without open-ended questions or narrative contributions (qualitative information).

The European cluster management excellence labelling system is based on the benchmarking of 36 indicators focused on different dimensions of the cluster and the cluster

organisation (Schretlen et al., 2011). The cluster benchmarking indicators offer a useful starting point to be tailored by the cluster management team to the needs of their organisation. They were designed to benchmark a cluster organisation, but not necessarily to determine the cluster organisation's performance or act as monitoring metrics.

Table 6 further below presents a set of suggested indicators for the ongoing monitoring of a cluster organisation's performance-based, in part, on the benchmarking indicators of the European cluster management excellence labelling system. The indicators are grouped along with categories that can be potential dimensions of a balanced scorecard strategy map. Dimensions and corresponding indicators should be selected or complemented to reflect the cluster's roadmap.

Each indicator is related to a specific objective to be achieved and a data source. While all of the suggested indicators provide quantitative results, a few could provide both quantitative and qualitative results.

These indicators on a cluster organisation's performance can be used to establish a **self-assessment tool** focused on management issues. Such a self-rating tool could serve as guidance for cluster stakeholders interested in setting up or supporting cluster organisations.

For this, it is necessary to refer to appropriate baseline indicators or targets, which can be inspired by the concrete experience of similar structures (see for example Box 3).

Table 6. Possible baseline indicators for a monitoring process of a cluster management organisation

DIMENSIONS	INDICATORS	OBJECTIVE	INPUT SOURCE	RESULT (quantitative / qualitative / both)
Cluster organisation's performance				
Structure of the Cluster	Number of International members	Set target number	Cluster Organisation	Quantitative
	Number of SME members, of which start-ups and scale-ups.	Set target number	Cluster Organisation	Quantitative
	Number of universities or research centres members	Set target number	Cluster Organisation	Quantitative
	Number of Innovation facilitator members	Set target number	Cluster Organisation	Quantitative
	Number of committed members	Set target number e.g. 40 (*)	Cluster Organisation	Quantitative
	% of members compared to cluster potential	Set target %	Cluster Organisation	Quantitative
	Geographical concentration of members (e.g. within 2 hours or 200 km)	Set target % e.g. 50% (*)	Cluster Organisation	Quantitative
Management Impact	Number of cluster members per cluster organisation employee (full-time equivalents)	Set target %	Cluster Organisation	Quantitative
	Diversity and frequency of services provided (**).	Set target number	Cluster Organisation	Quantitative
	% of members which had direct contacts with the cluster organisation in the last 12 months	Set target % e.g. 60% (*)	Cluster Organisation	Quantitative
Financial Management	Revenue based on member fees	Set target min %	Cluster Organisation	Quantitative
	Revenue based on chargeable services	Set target min %	Cluster Organisation	Quantitative
	Revenue based on private funding sources	Set target min % e.g. at least 50% (*)	Cluster Organisation	Quantitative
	Revenue based on private donations	Set target min value	Cluster Organisation	Quantitative
	Overhead costs	Set target max value	Cluster Organisation	Quantitative

Source: Authors based on (Christensen et al., 2012b; European Secretariat for Cluster Analysis (ESCA); United Nations Industrial Development Organization, 2012)

(\*) Examples of thresholds defined by ESCA to claim the Gold label. See "Revised gold label quality indicators for the EU cluster initiative excellence Phase II".

(\*\*) For example, Community building, supporting policy development, location branding, RDI, business development, HR development, entrepreneurship development, internationalisation.

**Box 3. Most relevant results recorded by clusters and innovation networks through the Performance Account in Denmark in 2018**

- **18,058 companies participated in the activities** of the 38 clusters and innovation networks covered by the 2018 Performance Account
- On average, each cluster organisation of the 38 clusters and innovation networks **employed 9.9 full-time equivalent**
- On average, the 38 clusters and innovation networks **collaborated with 34 different knowledge institutions and 47 different public actors**
- The **total financing** of the 38 clusters and innovation networks was DKK 494 million
- 3,445 companies participated in the 38 clusters and innovation networks' **collaboration projects**
- 434 companies participated in the courses and **training activities** organized by the 38 clusters and innovation networks
- 4,758 companies participated in **international activities** organised by the 38 clusters and innovation networks
- 720 newsletters, 408 press releases and 3,518 instances of **media coverage** were counted.

Source: [www.clusterexcellencedenmark.dk/da-DK/Danske-netværk-og-klynger/Innovationsnetværk-og-de-væsentligste-klynger-i-Danmark.aspx](http://www.clusterexcellencedenmark.dk/da-DK/Danske-netværk-og-klynger/Innovationsnetværk-og-de-væsentligste-klynger-i-Danmark.aspx)

## 4.2 How to monitor cluster partnerships

Cluster partnerships are an important area of EU support to clusters. Cluster partnerships are seen as a relevant tool to allow European clusters grow and become globally relevant. It is therefore a significant component of cluster policy, which should be monitored as such.

### 4.2.1 What is monitored?

As argued above, support to cluster partnerships can be seen as a specific component of cluster policy. Because the specific objectives of cluster policies vary widely, cluster partnerships that are set up as a result of such policies follow different structures and different objectives. For example, the European Strategic Cluster Partnerships (ESCPs) launched by the European Commission encourage clusters from Europe to intensify collaborations across regions and sectors. EU cluster partnerships are expected to pool resources and knowledge with a view to working on joint strategies and common actions.<sup>14</sup>

Different types of cluster partnership have been supported under the EU's programme to support the competitiveness of SMEs (COSME), namely for Smart Specialisation Investments (ESCP-S3), for Excellence (ESCP-4x), and for Going International (ESCP-4i). While the first two cluster partnerships (ESCP-S3 and ESCP-4x) aim to facilitate cluster cooperation and capacity-building in shared smart specialisation priority areas linked to industrial modernisation *within the EU*; the latter cluster partnerships (ESCP-4i) aim to encourage clusters to develop and implement a joint strategy that supports the internationalisation of SMEs in third countries *beyond the EU*.

Another type of European Cluster Partnerships are the so-called INNOSUP-1 cluster projects for new industrial value chains supported under

the Horizon2020 with a considerably higher budget. They promote cross-sectoral collaboration but also channel direct innovation support to SMEs via cluster organisations involved.<sup>15</sup>

These different examples of cluster partnerships may implement different monitoring processes and would implement different indicators according to their partnership objectives.

In accordance with the general framework for monitoring cluster policy (section 3.1), a prerequisite for an effective policy monitoring process is the identification and involvement of stakeholders (Table 7).

*Table 7. Stakeholder roles in the cluster partnership policy monitoring process*

Stakeholder	Role
Policy Unit	Design the monitoring process, to include indicators; Manage the monitoring process; Make decisions based on the data in support of the indicators and provided by the input sources
Cluster Partnership	Track required data in compliance and support of the monitoring process
Cluster Partnership Members (involved cluster organisations)	Align the cluster organisation monitoring process with the data tracking requirements of the cluster partnership policy monitoring process
Cluster Organisation Members	Provide the necessary information in accordance with related indicators as a large company, SME, research and technology organisation (RTO), cluster organisation member, such as business growth related to the cluster partnership activities; number of B2B agreements established through the cluster partnership activities, etc.
Local, Regional Governments	Make readily available data that supports the cluster partnership policy monitoring indicators

*Source: Authors*

<sup>14</sup> See <https://www.clustercollaboration.eu/eu-cluster-partnerships>.

<sup>15</sup> See <https://www.clustercollaboration.eu/eu-initiative/innosup-calls>

## 4.2.2 Indicators

As for cluster organisations and cluster policy, it is important to identify the objectives that drive the partnerships in order to identify the related

monitoring indicators. Most cluster policies that promote cluster partnerships will have objectives aligned with cluster organisations resulting in common monitoring indicators, as discussed earlier in this section.

### Box 4. Example of a system for monitoring a cluster partnership: Silicon Europe Worldwide

**About Silicon Europe Worldwide**  
Silicon Europe brings together European clusters in an alliance with access to advanced technologies and expertise in all fields of the electronics and software value chain. This network of clusters stands for a new, industry-led level of transnational collaboration.

**Examples of monitoring indicators**

Output  
Contacts to business support institutions in targeted countries  
Events organised by the cluster partnership in targeted countries  
SMEs which attended the events organised by the cluster partnership

Impact  
Planned number of foreign investors involved in defined actions  
Sought increase in European companies' turnover by international activities

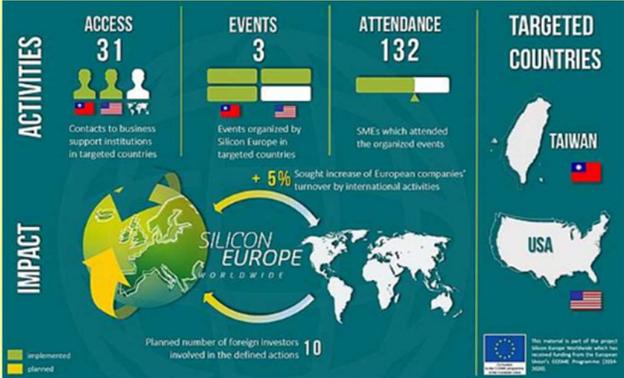
**Monitoring methodology**  
The results of the Silicon Europe Worldwide project are continuously tracked via a monitoring scoreboard. Thus, the "*activities*" are monitored through the following indicators:

- contacts to business support institutions in targeted countries,
- events organised by Silicon Europe in targeted countries, and
- SMEs which attended the organised events.

In addition, the "*impact*" is monitored through:

- increased turnover of European companies' from international activities and
- planned number of foreign investors involved in the defined actions.

Silicon Europe's target countries include Taiwan and the United States of America (USA).



The infographic displays the following data:

Category	Value	Description
ACTIVITIES - ACCESS	31	Contacts to business support institutions in targeted countries
ACTIVITIES - EVENTS	3	Events organized by Silicon Europe in targeted countries
ACTIVITIES - ATTENDANCE	132	SMEs which attended the organized events
IMPACT - Sought Increase	+5%	Sought increase of European companies' turnover by international activities
IMPACT - Planned Foreign Investors	10	Planned number of foreign investors involved in the defined actions

Targeted Countries: TAIWAN, USA

Legend: ■ implemented, ■ planned

Logo: SILICON EUROPE WORLDWIDE

Footer: This material is part of the project "Cluster Collaboration for European Recovery (ESC4)" funded by the European Union under the Horizon 2020 programme.

Source: Authors based on Silicon Europe, Monitoring Scoreboard, [www.silicon-europe.eu/projects/silicon-europe-worldwide/monitoring-scoreboard/](http://www.silicon-europe.eu/projects/silicon-europe-worldwide/monitoring-scoreboard/)

Annex A proposes a non-exhaustive list of possible indicators for cluster partnerships, while Box 4 above provides a concrete example

of a cluster partnership monitoring system by a European Strategic Cluster Partnerships for Going International (ESCP-4i) called Silicon Europe Worldwide.<sup>16</sup>

<sup>16</sup> <https://www.clustercollaboration.eu/escp-profiles/escip>

# 5 HOW TO EVALUATE CLUSTER POLICY

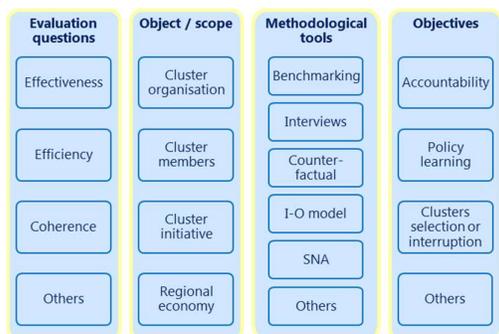
“Evaluating cluster policy” is challenging and requires approaches adapted to the specificity of clusters and cluster policies. Evaluation should be capable of capturing the effects of clusters on firm performance, and beyond, the effects on the wider system dynamics. It should also be able to assess impacts on regional and national economies, which potentially only materialise after a significant time lag. This chapter offers a comprehensive and systematic approach to evaluate cluster policy.

## 5.1 General approach and specific dimensions

The specificity of clusters and cluster policy underlined throughout this guide calls for the adoption of a **“developmental” approach** to evaluation.<sup>17</sup> In this approach, the focus is placed on learning in a flexible framework that evolves to reflect changes in cluster environment and structure. Even if it is carried out by external experts, evaluation should become an internal process feeding policy learning designed to foster a collective change effort. Also, in a developmental approach to evaluation, the objective is less to identify linear cause-effect relations than to trace interdependencies and emerging interconnections.

In the following, the different dimensions and related options to consider when developing an evaluation plan are presented. They are schematically represented in Figure 10.

Figure 10. Specific dimensions in the evaluation process



Source: Authors

## 5.2 Overall objective of the evaluation

A fundamental prerequisite is to identify the overall objective of the evaluation. Evaluation generally pursues a double mission: **accountability and learning**. The function of evaluation is to legitimate policy actions by documenting their effects and understanding mechanisms to support future policy choices (Schmiedeberg, 2010). Evaluations might take place in order to improve ongoing practices (*formative* evaluation) or to infer lessons for the next programming phase (*summative* evaluation). It is also necessary to determine what policy learning effects are expected in particular. Is it to select cluster initiatives, to end support, to learn how to improve support (Gallié et al., 2014)? The answer to these questions will determine whether the evaluation is done before, during or after the action is carried out (i.e. *ex-ante*, *in- itinere* or *ex-post*) and which methodological approaches and tools are most appropriate.

*Ex-ante* evaluations focus on the appropriateness of a cluster action or policy, or on selecting clusters that are eligible for support. Accompanying or interim evaluations (*in- itinere*) of cluster actions or policies are performed during the course of the cluster action or policy, and they measure mid-term impact. *Ex-post* evaluations are performed at the end of the cluster action and they measure the long-term impact of cluster actions or policies.

<sup>17</sup> see Paton (2006), quoted in (Cabaj, 2011).

## 5.3 Evaluation questions

The formulation of relevant evaluation question(s) depends on the intervention logic underlying cluster policy. This is not an easy task given the complexity of the interventions, the number and level of stakeholders involved and the multiple (and sometimes conflicting) objectives that can be pursued (Uyarra and Ramlogan, 2012). For this reason, it is important that stakeholders be involved in the formulation of the evaluation question(s) through a participatory approach (see the Basque country example in Annex B3).

Different **categories of evaluation questions** are traditionally distinguished, which can, to varying extents, apply to cluster policies:

- *effectiveness*: whether specific objectives are reached;
- *efficiency*: whether results are achieved at reasonable costs (Is the effect large enough to justify effort/investment? Are there other policy areas where the funding could be used in a more efficient way?);
- *relevance*: to determine the appropriateness of cluster policy compared to needs;
- *coherence* (consistency): whether a cluster initiative or policy complements or reinforces other industrial or economic policies and measures;
- *sustainability*;
- etc.

Of course, these questions are not mutually exclusive, and more than one evaluation question can (and should) be addressed in a single evaluation.

Evaluation questions can be formulated in general terms, referring to the criteria above, and apply indistinctly to a set of cluster initiatives. Or they can be specific and tightly related to the intervention logic (see Box 5).

### Box 5. Examples of specific evaluation questions

- Is cluster support focused on current or future strategic sectors or technologies?
- Does the cluster manager / cluster organisation provide efficient and effective support to cluster firms?
- Have the cluster measures led to sustainable new cooperation patterns between firms, research organisations, etc.?
- Has the cluster improved the innovation potential and economic performance of its member firms?
- Is the cluster contributing to the attractiveness of the region as a location for R&D and innovation?

*Source: (Technopolis Group & MIOIR, 2012)*

The evaluation should be clear about the type of effects it wants to capture (i.e. outcomes and impacts as argued in Chapter 2). The choice of the type of effects on which to focus – and the associated indicators – is closely related to considerations about the objects (or levels) of evaluation and the evaluation questions. As explained in Chapter 3, it is particularly important to cover those intermediate (outcome) effects, which are specific by-products of clusters. Besides economic effects, non-economic effects contributing to enhancing social capital should also be explored. Non-tangible effects such as the tendency to cooperate, increased trust, etc. may lead to behavioural changes that are expected to translate into quantitative, tangible economic effects. The mixed nature of the expected effects is apparent in concrete cases – see Box 6.

### Box 6. Examples of objectives and expected effects

- Overcome barriers to cooperation
- Induce behavioural change
- Improve innovative capacity of firms
- Strengthen user-oriented research
- Develop a critical mass of innovation excellence

*Source: (Technopolis Group & MIOIR, 2012)*

## 5.4 Object and level of evaluation

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An important issue is to determine the object of the evaluation. What is evaluated? Is it a specific measure, a set of measures or the more generic membership of a cluster? Focusing on one single policy instrument bypasses the synergy and additional impacts that result from belonging to a cluster (see Brenner and Schlump, 2011). In reality, evaluations often focus on the way in which belonging to a cluster generates a positive impact on member firms (with the implicit assumption that belonging to the cluster provides access to the different types of support measures).

The level or object of the evaluation where effects are expected to materialise should also be explicit (Merkl-Rachbauer and Reingruber, 2012):

- *cluster organisations*, e.g. with a focus on management issues;
- *cluster members* (i.e. firms and other members of a cluster organisation), e.g. with a focus on productivity;
- *cluster initiatives*, e.g. with a focus on the level of partnerships, growth of the cluster or

number and intensity of inter-firm connections, overall degree of trust, etc.;

- *the regional economy* (i.e. the effects at a more aggregate level beyond the cluster members), e.g. macroeconomic development, employment rates, etc.

As shown in Chapter 3, there is a broad correspondence between these levels and the type of effects that the evaluation wants to capture (i.e. outcomes at the level of cluster members and cluster initiatives, and wider impacts at the level of cluster members and beyond on the regional / national economy). Box 7 illustrates the case of an evaluation encompassing different levels of assessment – and related difficulties.

What needs to be considered is that these levels interact. The way in which a cluster organisation is managed is expected to influence effects recorded at the level of cluster initiatives, and how cluster members are impacted. This, in turn, should have repercussions at the level of the local or regional economy.<sup>18</sup> Hence, focusing on one level of evaluation – due to resources or data constraint might at least provide a (hypothetical) indication as to the wider effects, at the subsequent level.

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<sup>18</sup> The issue is that these interactions are often implicitly taken for granted, but a few studies have explicitly demonstrated some correlations. For example, Berthinier-

Poncet (2014) shows that the type of governance of cluster organisations influences the innovation performance of cluster member firms.

### Box 7. Evaluation of Walloon cluster policy

The Wallonia region in Belgium launched in 2005 the cluster policy "Marshall Plan", establishing five clusters. In 2009, the Marshall Plan 2.vert (2009-2014) established a sixth cluster. The objective is to promote partnerships and collaborative projects among industries, research centres and education institutions to stimulate R&D activities, increase investments and make the region a centre of excellence. An evaluation was carried out between August and December 2013. The objective was to examine cluster policy implementation and efficiency.

#### Methodology

There were two streams of activities: at the level of a single cluster organisation and at the aggregate level. Activities were:

- Visits to cluster sites and analysis of each cluster (creation of single project fiches);
- Interviews with directors and members of the cluster organisations and an online survey to investigate positive and negative aspects of being part of a cluster;
- Online surveys and interviews with stakeholders that are not members of cluster organisations to analyse the reasons why they refused to be part of them;
- Interviews with public and private, state and non-state actors who supported the Wallonia cluster policies;
- Analysis of 18 case studies of research or educational projects;
- Analysis of international studies of cluster policies;
- Analysis of institutional documents, national database of cluster organisations, national education strategies.

#### Indicators

A common framework of indicators was set up:

- *Resources*: such as private & public funds, actors involved in cluster management and employees, strategic planning, cluster organisation relations with other regional, national and international actors;
- *Realisation*: number of projects supported, engagement of SMEs, number of training courses;
- *Results and impacts*: number of international collaborations, number of new enterprises, number of filed patents, degree of satisfaction of cluster members, evolution of R&D investments in Wallonia.

#### Lessons learnt

- Difficulties to evaluate the policy because the R&D projects have a long-term impact;
- Difficulties to measure the socio-economic impacts and degree of satisfaction of cluster members;
- Difficulties to take all different phases and evolutions of the cluster policy into account;
- Difficulties in gathering data for all the indicators about the creation, development and commercialisation of R&D projects;
- Need to introduce new indicators to evaluate the impact of training courses;
- Need for regularity of the exercise, e.g. by carrying out the evaluation each year;
- Need to introduce specific categories to classify sustainable and green projects.

*Source: Authors based on Bruno et al., 2014.*

## 5.5 Methodological approaches and tools for data analysis

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### 5.5.1 Methodological approaches

Different tools are available to analyse the effects of clusters and cluster policies. These tools can be combined to cumulate the advantages of the respective methods and account for the specificity of clusters and cluster policies (Ketels et al., 2012).

One distinction is between **impact assessment and benchmarking** approaches (Ecotec Research & Consulting, 2004; Kind and Meier zu Köcker, 2013b; Lindqvist et al., 2012). The two approaches rely on fundamentally different underlying foundations. While *impact assessment* adopts a vertical view, implying the succession of different stages, in which policy inputs translate into effects and impacts, *benchmarking* has a comparative and horizontal perspective in which performance is assessed against that of peer institutions.

The two approaches are not interchangeable, they respond to different (evaluation) questions, and apply to different evaluation objects. An *impact assessment approach* is better suited to account for policy and regional effects. A *benchmarking exercise* is appropriate at the level of cluster organisations to capture their effectiveness in terms of management (Christensen et al., 2012) but also at policy level as far as services and support to cluster initiatives and firms are concerned. The two offer complementary views on the different facets of cluster performance.

In turn, impact analyses can be further divided into **theory-based impact evaluation and counterfactual impact evaluation** (Merkl-Rachbauer and Reingruber, 2012). *Counterfactual impact evaluation* aims at identifying quantitative effects and determining the magnitude of the impact by asking what would have happened in the absence of policy

intervention. *Theory-based impact evaluation*, on the other hand, is interested in explaining how effects were reached.

In short, counterfactual impact evaluation determines if and how far an intervention works, while theory-based impact evaluation tries to explain how an intervention works.

### 5.5.2 Methodological tools

This section outlines different tools available to analyse data – with a short description of their main advantages, limitations and conditions for use – and provide concrete examples. Among these methodological tools, one can distinguish between *tools relying on aggregated individual member data*, adapted to account for potential aggregated quantitative impacts and *systemic tools*, which consider clusters and their members as systems. The latter are useful to illustrate how clusters function and what types of specific effects in terms of collaboration and networking between members they bring about (Schmiedeberg, 2010). They are particularly important to explore intermediate impacts of cluster policies on firm behaviour related to networking (Wise and Wilson, 2017).

#### Benchmarking

Originally a management tool, benchmarking has been used several times in the context of cluster policy evaluation, in particular as far as the role and functioning of *cluster organisations* are concerned (Christensen et al., 2012, Meier zu Köcker and Rosted, 2010). In this respect, identifying meaningful indicators that make relevant comparisons possible is key. Such indicators can be qualitative and quantitative, and they can deal with cluster organisation management (see Chapter 4 where the case of the European labelling system for Cluster Management Excellence is discussed) or the services offered to cluster members.

Several **benchmarking steps** should be adopted:

1. Find a benchmarking group (i.e. which other entities the benchmarking exercise should encompass),
2. Define dimensions and indicators of performance,
3. Identify best in class organisations or programmes,
4. Determine performance gaps (which can be measured)
5. Describe best practices.

Benchmarking is also used to compare broad approaches to cluster policy, like for example previous Cluster Policy stress tests done at EU level or the scoreboards.<sup>19</sup>

## Case studies

Case studies are useful when evaluating cluster policies, in particular in relation to cluster performance or firm performance. They can complement other quantitative or qualitative tools used in an evaluation study. A number of case studies, for example, of cluster firm projects or of cluster initiatives can be used. Case studies can illustrate specific issues and address cost-effectiveness/efficacy issues.

Alternatively, they can be used in the context of a benchmarking exercise. Case studies are often used when quantitative data shows correlations, but there is a doubt about causality. The limitation is that the results of case studies generally do not allow for generalisations. Their advantage is that they **identify the underlying mechanisms at work** and account for the complexity and uniqueness of cluster initiatives. They are useful for *learning* purpose and, for this reason, "negative" cases can also be selected.

## Counterfactual (micro econometric) analyses

**Control group approaches** of counterfactual analyses are implemented at firm level. They are useful to compare firm performance within and outside clusters (Christensen et al., 2012) and between a group of firms that were targeted by policies and another that was not. The main difficulty is to identify the control group, i.e. the non-supported or "non-treated firms".

Different approaches are possible. In general, the "*difference in difference*" formula is preferred (i.e. combining before / after comparisons and with / without situations). The risk of selection bias is generally high as participation in a cluster might be related to factors also explaining overall performance.<sup>20</sup> As these analyses are focused on firms, they make it possible to capture the indirect effects of the cluster on member firms.

The main limit of counterfactual analyses as far as cluster policy evaluation is concerned, is that they do not provide a systemic view of the entire cluster. The whole process of cluster policy and development is thus seen as a "black box" (Schmiedeberg, 2010). This inconvenient aspect can be mitigated by complementing the approach with a careful analysis of the context in which the evaluated cluster policy takes place.

Box 8 illustrates the case of an evaluation based on a counterfactual analysis.

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<sup>19</sup> See also, for example, Røtnes et al. (2017).

<sup>20</sup> To avoid selection bias, different models are available in Schmiedeberg, 2010.

### Box 8. *Impact assessment of EUREKA network projects and clusters projects*

EUREKA is an intergovernmental network established in 1985, involving over 40 countries, whose aim is to enhance European competitiveness by fostering innovation-driven entrepreneurship in Europe, between small and large industry, research institutes and universities. An impact assessment of the EUREKA cluster projects and network projects was realised over the 2007-2011 period.

#### Methodology

- Counterfactual survey addressed to around 3,000 firms involved in EUREKA projects, of which over 370 firms answered (response rate of evaluable questionnaires of around 19%);
- Econometric assessment using a “difference-in-difference” design, and a two-stage approach;
- Survey data of treated (participants in EUREKA projects) and non-treated companies (researching firms without participation);
- Econometric analysis based on enriched data on the economic development of participating and non-participating companies;
- In-depth comparative case study approach, building on a multiple-respondent design with several respondents per EUREKA project from different firms and a within- as well as across-case comparison based on the intervention logic of EUREKA.

#### Indicators

- Economic performance (e.g. increased turnover, increased number of staff, increased number of research staff, and increased exports);
- Market development (e.g. entering new local/foreign market, improved local/foreign market share, and improved competitive position);
- Other economic achievements (e.g. enhanced productivity, savings in resources e.g. in time or costs, external capital raised, and creation of spin-off companies);
- Changes in the organisation (e.g. change of commercialisation strategy, change of innovation strategy, improved management, and quality of work).

#### Lessons learnt

- Through data triangulation (i.e. involving multiple times and persons), results provided insights on the impacts of EUREKA-funded projects on firms, differentiating by size and innovation type of participating firms.
- Difficulties in capturing the impact of EUREKA projects on large enterprises remained challenging because of many exogenous factors.

*Source: (Kramer et al., 2017)*

## Input-output models

Input-output models (I-O models) are used in cluster policy evaluation to offer a systemic, static and descriptive view of cluster initiatives. Based on regional input-output tables, I-O models **study the relations between industries and spatial units**. They account for linkages such as inter-industry flows of intermediate and final goods and services and value-added chains and identify the importance of specific industries for regional economic development. Besides assessing the main

features of clusters, I-O models are therefore also useful in the statistical identification of agglomeration of economic activities, which can offer potential for developing policy-supported clusters.

Some issues associated with this methodology concern the statistical definition of clusters and their boundaries, which are not necessarily coinciding with traditional geographical and sectoral data. There is also the inconvenience from the perspective of cluster policy evaluation that they do not cover non-economic links

(both codified and tacit) between clusters stakeholders and thus offer an incomplete picture of cluster initiatives. Box 9 below

illustrates the use of an I-O model by a cluster policy evaluation.

#### *Box 9. Evaluation of the cluster policy of Scottish Enterprise Network*

The Scottish Enterprise Network identified in 1993 potential clusters of competitiveness in Scotland. In 1998, four pilot cluster were established, followed in 1999 by six others. An ex-post evaluation took place in 2003 to identify the macro impacts of clusters in the Scottish economy at the macro (Scottish region), meso (clusters) and micro (firms) levels.

##### **Methodology**

- 'Industrial survey' methods, i.e., interviews, questionnaires to cluster organisations to assess the direct effects on individual cluster sectors;
- Computable General Equilibrium (CGE) model ("AMOS"<sup>21</sup>) to quantify multiplier and displacement impacts at the macro level;
- Input-Output table to quantify the size, importance and character of a cluster by identifying the scale of cluster sectors and the forward and backward sales and purchase links between cluster sectors and other local sectors, both within and outside the cluster. It also shows the links the cluster has with the rest of the nation and the rest of the world through trade flows;
- Demand- and supply-driven multiplier analysis used to quantify more effectively intra-cluster linkage effects and the relationship between a cluster and the rest of the local economy.

##### **Indicators**

- *Firm level:* active participation in networks; number of business trading online; number of strategic alliances, joint ventures and collaboration; level of value-added per employee; level of investments in R&D.
- *Cluster level:* number of patents; growth in new firm information; level of venture finance; number of high performing firms; increase number of active networks; improve specialist labour pools. Those criteria represent the Balanced Scorecard able to measure the performance change in the cluster.
- *Macro/regional level:* productivity; average wages; wage growth; level of GDP/capita; cost of living; exports.

##### **Lessons learnt**

- Input-Output (I-O) analysis is as an informational aid to policy-makers because it provides a quantitative overview of the cluster;
- It is limited as an ex-post evaluation tool because of problems in identifying the counterfactual (i.e. what would not have happened without support) and measuring the effects of particular policy instruments;
- Using multi-sectoral modelling techniques (either I-O or CGE), it might be difficult to map the cluster as defined for policy purposes to the I-O table;
- I-O in cluster analysis does not identify the existence of information and knowledge spill-overs and the provision of local public goods;
- This aggregate approach is complementary to, not competitive with, other more microeconomic forms of analysis.

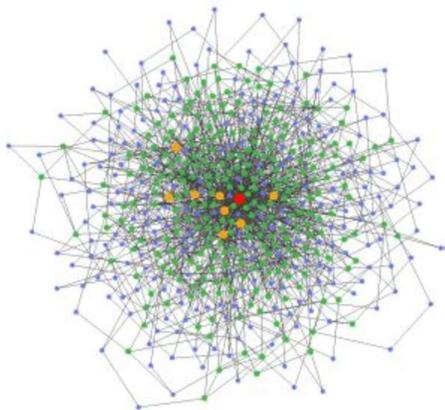
*Source: Learmonth et al., 2003.*

<sup>21</sup> AMOS is a macro-micro simulation framework parameterized on Scottish data.

## Social network analysis

Social network analysis (SNA) adopts a systems perspective to look at communication and interactions between cluster members. Based on an "interaction matrix", SNA offers the possibility of presenting graphical visualisation (see Figure 11) along with quantitative analyses to identify weaknesses in communication and cooperation patterns. It is also possible to use an SNA to adopt the perspective of a single actor of the cluster and analyse its position.

Figure 11. An example of representation of a network structure using SNA



Source: Giuliani and Pietrobelli (2011)

Carrying out an SNA is resource-intensive. It requires access to data on relationships, which are not readily available. These can be collected through online surveys and / or interviews. Other sources / indicators could include email communications, co-authorships or collaboration between firms.

Like Input-Output models, SNA are used to **identify and assess collaboration patterns**. And like Input-Output models, SNA are static—unless the analysis is repeated at different

points in time. Also, SNA measure relationships (i.e. an intermediate outcome) but not economic performance (Ardovino and Cucco, 2014; Giuliani and Pietrobelli, 2011; Russo et al., 2018).<sup>22</sup>

## Comprehensive and combined approach to key performance indicators and methodological tools

The selection of the monitoring and evaluation methodology should take into account the specific **informational needs** of cluster managers and policy makers. No single method can account for the multi-faceted dimension of clusters and cluster policy, and their effects. To the extent possible, methods should, therefore, be combined in a comprehensive approach that comprises **quantitative and qualitative evidence** to make possible a broader understanding of the effects of cluster policy (Aranguren et al., 2014).

It is also necessary to ensure the "**ownership**" of seemingly complex methods (from an academic perspective) by stakeholders directly involved, such as policy-makers who commission or carry out the evaluation. They are "closer" to the data and know best their limits and potentials (Smith et al. 2016 quoted in (Wise and Wilson, 2017)

Finally, the evaluation process should be **open and transparent** in order to achieve the desired understanding of results and acceptance by cluster managers and policy makers (Kind and Meier zu Köcker, 2013a).

Box 10 illustrates a prominent example of a cluster evaluation showing how the tools discussed above can be combined into a comprehensive approach.

<sup>22</sup> Other approaches are possible to account for the dynamics of collaboration within clusters. For example, Smith and Brown (2009) adopts a system thinking approach to help understand cluster development and

inter-firm collaboration. The authors show how clusters evolve from competition through cooperation into deeper collaboration.

### Box 10. Evaluation of the German leading-edge cluster competition

The leading-edge cluster competition ("Spitzencluster-Wettbewerb") was initiated in 2007 by the German Federal Ministry of Education and Research to support innovation clusters in a nationwide contest. In three waves, 15 cluster initiatives were selected and provided each with up to € 40 million for a maximum of 5 years (i.e. a total of up to € 600 million of funds) to support them becoming international leaders in their field of technology.

#### Methodology

- Literature review, statistical data and interviews with industry experts, consultants and cluster stakeholders were used to address the procedural aspects of policy implementation and the regional and sectoral positioning of clusters. A comparison with the positioning of European clusters established by comparable European programmes was realised.
- A network analysis examined network relations. The analysis went beyond individual collaborative relationships and considered the structure resulting from all bilateral or multilateral cooperative ties so that the structural effects of cluster policies become visible.
- A written survey of funded cluster organisations, interviews with cluster managers and cluster actors and findings from the analysis of the sectoral innovation systems and networking were used to identify first effects at regional level. The data collected through the surveys were primarily processed through means of descriptive analyses. In order to account for the heterogeneity of the responses between the clusters, the correlations between cluster specifics and response behaviour were estimated by means of multivariate regression methods.
- A counterfactual analysis was carried out to identify the effects of the cluster competition support on firm-level R&D activities (R&D expenditure and R&D personnel).

#### Indicators

- Patent microdata from research and innovation surveys
- Counterfactual analysis that relied on a data set combining different R&D statistics and surveys

#### Lessons learned

- The programme design influences the programme effects, e.g. by promoting additional activities of SMEs.
- The support for the leading-edge clusters contributed to intensifying networking between innovative stakeholders in the regions.
- It was possible to already identify some types of regional effects of the support to the leading-edge clusters via the accompanying evaluation: effects of activity, first outputs in terms of innovations, patents and publications with expected long-term effects on jobs and growth; and an improved visibility of the leading-edge cluster regions and enhanced regional R&D activity and attraction of skills (high potentials). The analysis identifies a leverage effect on R&D expenditure, more significant for SME than for large firms.

*Source: Rothgang et al. (2017), and <https://www.bmbf.de/de/der-spitzencluster-wettbewerb-537.html>  
[www.bmbf.de/de/spitzencluster-foerderung-zahlt-sich-aus-studie-belegt-leistungsfahigkeit-der-15-1506.html](http://www.bmbf.de/de/spitzencluster-foerderung-zahlt-sich-aus-studie-belegt-leistungsfahigkeit-der-15-1506.html), and  
<http://www.rwi-essen.de/spitzencluster.pdf>*

## 5.5.3 Participatory approaches and stakeholders' involvement

As described earlier in the result-orientated monitoring process and as hinted earlier in this section, the very evaluation process too benefits

from the active participation of stakeholders. It can help design the evaluation questions, contribute to data collection, provide feedback on the evidence produced, and overall help stakeholders to take part in the learning process.

A broad definition of stakeholders could be adopted, including experts and practitioners from other regions or countries. Box 11 below illustrates examples of international networks bringing together stakeholders in cluster policy discussion also in relation to monitoring and

evaluation, which can provide valuable support in designing and running cluster policy evaluation.

*Box 11. Networks of cluster policy stakeholders active in the field of monitoring and evaluation*

**TCI Network of cluster practitioners and policy-makers**

Founded in 1998, the *TCI Network*<sup>23</sup> is a non-profit and non-governmental organisation reaching out to 9,000 professionals from development agencies, government departments, cluster organisations, academic institutions, companies and multilateral organisations in over 110 countries. It provides services to allow the advancement of cluster-based economic development (e.g. matchmaking, study tours, peer reviews etc.).

In 2012, the TCI Network has created the **cluster evaluation working group**, gathering together academics, policy-makers and cluster practitioners from around the world to collectively address the challenges of evaluating cluster efforts. It has organised workshops and sessions at global conferences and provided concrete outputs including a bank of survey questions on collaborative dynamics, a set of guiding principles for cluster evaluation, and frameworks to aid the design and implementation of evaluation processes.

**European Cluster Collaboration Platform**

The European Cluster Collaboration Platform<sup>24</sup> is the main online hub for cluster stakeholders across Europe with over 1000 registered cluster organisations that reach out to more than 109.000 specialised SMEs, 12.000 large enterprises and 10,000 research and technology organisations. The platform was set up by the European Commission's Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs to support the mapping and connecting of cluster actors across Europe. It provides training, workshops, conferences and webinars to strengthen capacity building and the partnering of cluster organisations. It organises international cluster matchmaking events to support SME internationalisation through clusters and facilitates mutual cluster policy learning.

Concerning the latter, the European Cluster Collaboration Platform organises events, maps cluster policies and programmes, and provides discussions papers as input to the discussions of the **Commission Expert Group on Clusters**<sup>25</sup> that brings together governmental and individual experts with the view of preparing recommendations on how to better use clusters as a strategic tool of industrial policy. It has followed up the discussions of the previous European Cluster Policy Forum.

**European Cluster Excellence Associations**

The European Cluster Excellence Associations is in the process of being set up to take over the governance of the European labelling system for Cluster Management Excellence (see section 4.1.1) from the European Secretariat for Cluster Analysis (ESCA) that currently runs the labelling system on the basis of a benchmarking of the performance of cluster organisations.

**European Cluster Alliance**

The European Cluster Alliance is an initiative that brings together 11 **national cluster associations** from 10 EU Member States, who have agreed to team up for joined actions and to speak with one voice towards policy makers across Europe's ecosystems. It follows from the Bucharest Declaration at the European Cluster Conference in May 2019 and the Warsaw Act of September 2019. The initiative has taken up the name of the European Cluster Alliance that was used previously by the gathering of European cluster policy-makers under the European Commission's PRO INNO Europe Initiative.

*Source: Authors and indicated weblinks*

<sup>23</sup> <http://www.tci-network.org/>

<sup>24</sup> <https://www.clustercollaboration.eu/>

<sup>25</sup> <https://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetail&groupID=3636>

# 6 HOW TO ESTABLISH A CUSTOMISED MONITORING AND EVALUATION PLAN

As argued throughout this guide, each cluster and cluster policy is unique and requires a tailor-made monitoring and evaluation approach. In this chapter, the main step towards the establishment of a customised monitoring and evaluation plan are summed up, based on the different options explored in the preceding chapters. Other important operational matters are also flagged out.

## 6.1 Key steps to establishing a customised monitoring and evaluation plan

Each cluster organisation and cluster policy has specific objectives. Thus, the methodology, KPIs and stakeholders involved in the monitoring and evaluation (M&E) process will differ according to the informational needs of each cluster organisation and policy maker and be the object of an individual Monitoring and Evaluation plan. Its design also needs to take into account existing data and available resources, such as financial and human resources.

Although there is no standard approach, the M&E plans generally include core principles, steps and decisions that allow cluster managers and policy makers to tailor-make the plan according to their needs. The objective is to

establish an M&E plan that provides for a **continuous process of monitoring and evaluating** cluster policy. All too often, monitoring and evaluation take place separately or even independently, whereas, as argued in Chapter 2, there is a continuum between monitoring and evaluation, connected by the practice of result-oriented monitoring.

The M&E process should be designed early during the planning stage. This will allow continuous and more effective measurement of the performance of cluster organisations and cluster policies. Moreover, the stakeholders involved will have a more comprehensive understanding of the outcomes since results will be assessed in the mid and long-terms (Inno Germany AG, 2010).

Table 8 details the **different steps** and corresponding options among which it is necessary to choose in order to establish a customised M&E plan for cluster policy.

Table 8. Steps towards setting up a customised monitoring & evaluation framework

STEPS	Sub-steps and options
1. Clarify the intervention logic / establish a roadmap	
2. Establish a metrics system	<ul style="list-style-type: none"> <li>• Clarify level of ROM: (policy, cluster organisation)</li> <li>• Chose approach: (log frame, BSC)</li> <li>• Consult stakeholders</li> </ul>
3. Trigger a continuous monitoring process	<ul style="list-style-type: none"> <li>• Identify stakeholders and define arrangements for involving them</li> <li>• Chose indicators</li> <li>• Establish data collection protocol</li> <li>• Define reporting procedures</li> <li>• Involve stakeholders</li> </ul>
4. Formulate and implement an evaluation plan	<ul style="list-style-type: none"> <li>• Clarify objective</li> <li>• Determine evaluation questions</li> <li>• Determine level and type of effects to focus on</li> <li>• Identify source of evidence and corresponding data collection tool</li> <li>• Chose methodological approach and tools combination</li> <li>• Report to stakeholders</li> </ul>
5. Define management provisions	<ul style="list-style-type: none"> <li>• Define responsibilities</li> <li>• Ascertain resources availability</li> </ul>

*Source: Authors*

## 6.2 Management and resources

The monitoring and evaluation plan should contain two important pieces of information: the definition of responsibilities and the identification of adequate resources.

### 6.2.1 Key responsibilities and competence

The M&E plan should identify the cluster stakeholders that will be involved in the process

as well as determine their key responsibilities. The M&E plan of cluster policies should clearly identify the stakeholders responsible for information collection, analysis, evaluation reporting and result sharing.

Table 9 provides an overview of the key responsibilities of stakeholders involved in the monitoring and evaluation of cluster policies. This should be viewed though as an illustrative approach since stakeholders and key responsibilities are not definitive.

Table 9. Key responsibilities of stakeholders involved in cluster policy monitoring & evaluation (M&E)

STAKEHOLDERS	KEY RESPONSIBILITIES
Cluster Managers	Cluster managers need to be able to carry out the following activities: <ul style="list-style-type: none"> <li>• Planning;</li> <li>• Determining the cluster organisation’s informational needs;</li> <li>• Deciding whether to select an internal or external evaluator;</li> <li>• Allocating human and financial resources to the M&amp;E process;</li> <li>• Selecting key performance indicators (KPIs) to measure results;</li> <li>• Identifying M&amp;E periods;</li> <li>• Preparing terms of reference (ToR) for the evaluators;</li> <li>• Making decisions based on the M&amp;E results.</li> </ul>
Team that collects information	The team responsible for collecting information should be able to: <ul style="list-style-type: none"> <li>• Collect baseline data;</li> <li>• Set realistic targets for the KPIs based on baseline data;</li> <li>• Identify possible risks and implicit assumptions (R&amp;A);</li> <li>• Continuously monitor results and R&amp;A.</li> </ul>
Evaluator	The internal or external evaluator should be responsible for: <ul style="list-style-type: none"> <li>• Conducting the evaluation;</li> <li>• Ensuring the day-to-day management of M&amp;E operations;</li> <li>• Providing regular progress reporting to the cluster manager;</li> <li>• Developing the deliverables in accordance with informational needs.</li> </ul>
Policy-makers	Policy-makers should be responsible for performing the following tasks: <ul style="list-style-type: none"> <li>• Planning;</li> <li>• Determining the informational needs;</li> <li>• Deciding whether to select an internal or external evaluator;</li> <li>• Identifying the stakeholders that should be involved;</li> <li>• Selecting KPIs to measure results;</li> <li>• Identifying M&amp;E periods;</li> <li>• Preparing Terms of Reference (ToR) for the evaluators;</li> <li>• Using the M&amp;E results;</li> <li>• Making decisions based on the M&amp;E results.</li> </ul>
Cluster organisations, cluster managers, cluster members, beneficiaries, subcontractors, partners, and research and technology organisations	The wider cluster stakeholders should be responsible for: <ul style="list-style-type: none"> <li>• Contributing to elaborate research questions</li> <li>• Contributing to choose indicators and set targets.</li> <li>• Providing baseline data.</li> </ul>

*Source: Authors, based on Schretlen et al. (2011); United Nations Industrial Development Organization (2012); United Nations Office for Disaster and Risk Reduction(2015)*

As previously stated, while monitoring should be an internal and ongoing process, evaluation is often delegated to an independent evaluator. External evaluations frequently provide more credibility to the results, which is important in following up on conclusions and recommendations. Monitoring can be conducted internally by the government agency or the cluster programme management (Inno Germany AG, 2010). In both cases, external evaluations can provide cluster stakeholders

with a holistic view on the cluster organisation or cluster policy.

As with all policy monitoring processes, it is important to have a single contact person within the organisation that is responsible for the monitoring process, to create a proper protocol for acquiring the indicator-related data, to identify indicators and their respective input sources, and to get the ‘buy-in’ of all stakeholders to feed data into the process.

## 6.2.2 Budgetary resources

The monitoring and evaluation plan should detail the budgetary resources that are available for the design, implementation and maintenance of the M&E system. The definition of budgetary limits is crucial for setting the precise object of M&E, prioritising the most relevant indicators to be addressed, deciding whether to do an internal or external evaluation and determining the human resources that will be involved.

In an external evaluation, the costs for M&E should be predefined, and the basis for payment and payment scheduling should be determined with the evaluator before signing the contract. Furthermore, cluster managers and policy makers should ask for regular reports in order to keep track of external costs. In internal evaluations, cluster managers and policy-makers should implement an accounting system at the beginning of the M&E process to track costs.

It is important to emphasise that cluster managers and policy-makers often have to face heavy budget constraints that can hinder data collection and evaluation (Inno Germany AG, 2010; United Nations Office for Disaster and Risk Reduction, 2015).

Competence, human resources, technical resources, implementation and maintenance of monitoring processes require financial, human, and technical resources, which can represent a challenge for the cluster management organisations. The maintenance of a regular monitoring process should take into account the required competences in terms of management and technology systems. Procedures or technologies generally need upgrading and modernising (Kusek and Rist, 2004). Before designing the monitoring system, cluster organisations should identify available resources and competences to avoid setting up a system that is too demanding.

Deciding a priori of a fix number is difficult as it depends on the budget of the cluster policy or programme, on the volume and target of the evaluation, the methodology used, etc. As an example, the Walloon region recently launched a call for monitoring the cluster policy during 2019-2024 amounting to 6 million euro. As to the French Pôles de Compétitivité, they were evaluated during the policy's third phase through a contract worth 268.270 euro (see Annex B - ).

# 7 CONCLUSIONS AND RECOMMENDATIONS

This chapter summarises the main conclusions from analysing the different facets and dimensions of cluster policy monitoring and evaluation. It introduces recommendations for cluster policy-makers and cluster organisations to design and run an effective monitoring and evaluation system for cluster policy.

Monitoring and evaluating cluster policy in all its dimensions is challenging because of some specific features characterising clusters and cluster policies. At the core of these difficulties is the complexity of the expected causal relations linking policy input to expected effects. This is in part related to the complexity of the policy setting underlying cluster policies, and in part to the important role played by the **strength of partnerships**. The latter produce effects that are intangible and therefore difficult to capture and measure, but this is certainly not a reason for neglecting them. On the contrary, this Smart Guide extends an invitation to fully account for this dimension and integrate it in monitoring and evaluation.

Likewise, this Smart Guide shows that the whole monitoring and evaluation structure should be established at the **outset** of the cluster policy process and it should adhere to an **explicit intervention logic**, which refers to clear and specific objectives. This makes possible to deploy a monitoring and evaluation system where the two activities are closely intertwined and nested around the intervention logic underlying policy developments. Other challenges are at work, such as the **time lag** before the effects of clusters and cluster policy materialise, or more operational issues like the participatory dimension of the cluster policy-making.

The Smart Guide has provided **practical monitoring and evaluation examples** for

- *a national cluster policy or programme*, with the evaluation of the German leading-edge cluster competition (Box 10);
- *regional cluster policies or programmes*, e.g. Balanced Scorecard approach for a cluster programme in Lower Austria (Figure 7), an evaluation of cluster policy in Wallonia,

Belgium (Box 7) and an evaluation of cluster policy by the Scottish Enterprise Network (Box 9);

- *cluster organisations*, with the tracking of Performance Accounts in Denmark (Box 2 and 3); and
- *cluster partnerships* with a cross-regional/cross-border dimension, e.g. the monitoring of the “Silicon Europe Worldwide” European cluster partnership (Box 4) and the impact assessment of EUREKA innovation networks and cluster projects – complemented by the set of possible indicators outlined in Annex A.

Annex B highlights further **examples of unique evaluation designs**. They include the pôles de compétitivité initiative in France that linked evaluation results to continuation funding (B1), the Swedish Vinnväxt programme (B2) that tries to capture system-level effects, and the Basque country cluster policy (B3), where a participatory approach was tested.

Overall, the reported results demonstrate that **cluster policies and programmes generate positive results** at different levels.

Last, the general challenge that this guide had to face is to deal with the sheer variety of policy settings and objectives characterising cluster policies across countries. It was necessary to extrapolate a general framework sufficiently ample to accommodate this diversity without losing sight of the specificity of cluster policy. On the different fronts briefly summarised above, the Smart Guide identifies a number of solutions, which are necessary conditions or guidelines to get things right. They are illustrated in the following **Do’s and Don’ts for a successful monitoring and evaluation system** (see Table 10 below).

Table 10. Do's & Don'ts for establishing an effective cluster policy monitoring & evaluation system

 <b>Do's</b>	 <b>Don'ts</b>
<ul style="list-style-type: none"> <li>• <b>Clearly spell out the specific objectives</b> pursued by cluster policy and the corresponding underlying intervention logic.</li> </ul>	<ul style="list-style-type: none"> <li>• Don't take for granted the benefits of clusters and cluster policy in general (otherwise more efficient ways of unlocking the potential of clusters cannot be identified).</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Integrate and embed monitoring and evaluation in the cluster policy setting</b> right from the beginning.</li> </ul>	<ul style="list-style-type: none"> <li>• Don't consider monitoring and evaluation as separate processes.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Support continuous strategic learning</b> on the basis of output from the monitoring and evaluation system.</li> </ul>	<ul style="list-style-type: none"> <li>• Don't confuse evaluation (as a strategic learning tool) with audit (i.e. an exercise limited in time only aimed at verifying and justifying public expenditure).</li> </ul>
<ul style="list-style-type: none"> <li>• Make sure to understand and <b>account for clusters effects in terms of collaborative dynamics</b> and the influence of cluster policy on it.</li> </ul>	<ul style="list-style-type: none"> <li>• Don't rely only on traditional quantitative metrics.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Mobilise a basket of evidence and methodologies</b> to deal with issues in the causation chains between policy input and expected impact.</li> </ul>	<ul style="list-style-type: none"> <li>• Don't rely only on a single methodology or stream of evidence.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Adopt a participatory approach by involving relevant stakeholders</b> to ensure ownership and embeddedness in the policy setting and learning at all stages of the monitoring and evaluation process.</li> </ul>	<ul style="list-style-type: none"> <li>• Do not consider evaluation as a purely external exercise</li> </ul>

Source: Authors, adapted from (TCI network, 2017), <https://issuu.com/tcinetwork/docs/clusterevaluationbooklet>

# Annex A - Example of indicators

Table 11. Set of possible indicators for a result-orientated monitoring system applied to cluster partnerships

Input What is invested?		Data/information source
Volume of investment	Government funds invested in the policy objectives	- Policy unit
	Stakeholder funds invested in the policy objectives	- Local, Regional governments - Cluster organisations, cluster partnership - Cluster members
Output What are the activities?		Potential Input Source
Cluster organisation	See baseline indicators of Table 6	- Cluster organisation
Business facilitation activities	Number of business meetings, sensitization events, exposure visits facilitated by the cluster partnership	- Cluster partnership
Policy facilitation activities	Number of multi-stakeholder meetings facilitated by the cluster partnership	- Cluster partnership
Networking facilitation activities	Number of matchmaking and networking events with external partners facilitated by the cluster partnership	- Cluster partnership
	Number of multi-cluster agreements established	- Cluster partnership - Cluster partnership members (i.e. cluster organisations)
Outcome What are the short and mid-term results?		Potential Input Source
Effectiveness of business-side facilitation activities	Share of cluster members associated with at least one relevant formal business network activity conducted by the cluster partnership	- Cluster - Cluster partnership members (i.e. cluster organisations)
Level of involvement	Share of cluster organisation members involved in joint actions established by the cluster partnership	- Cluster partnership - Cluster partnership members (i.e. cluster organisations)
	Number of cluster member participants per cluster organisation event (fair, matchmaking, workshop)	- Cluster partnership
Accessibility of services	Share of cluster organisation members who have used relevant cluster partnership services (e.g. B2B agreement facilitation) in the last 6 months	- Cluster partnership - Cluster partnership members (i.e. cluster organisations)
	Number of cluster members supported by services	- Cluster partnership
Partnership involvement in policy initiatives	Number of B2B agreements across clusters	- Cluster partnership - Cluster partnership members (i.e. cluster organisations)
	Number of B2B agreements between European and 3 <sup>rd</sup> countries	- Cluster partnership - Cluster partnership members (i.e. cluster organisations)
	Number of new strategic or operational partner agreements	- Cluster partnership members (i.e. cluster organisations)
	Number of new collaborative <u>R&amp;D</u> projects among cluster members (can distinguish between regional, national, international)	- Cluster partnership members (i.e. cluster organisations)
	Number of new <u>innovation</u> cooperation projects among cluster members (distinguish between regional, national, international)	- Cluster partnership members (i.e. cluster organisations)
	Number of new <u>market opportunity</u> cooperation projects among cluster members (distinguish between regional, national, international)	- Cluster partnership members (i.e. cluster organisations)
	Average number of interactions per cluster member	- Cluster partnership

Impact		Potential Input Source
What are the long-term results/impacts?		
Technology development and innovation	Number of collaborative partnerships in the fields of technology development, technology transfer or R&D fostered by the cluster partnership	- Cluster partnership - Cluster partnership members (i.e. cluster organisations) - Cluster organisation members
	Impact of the work of the cluster partnership on R&D activities of the related cluster organisation members (e.g. number of R&D projects generated from cluster partnership networking activities)	- Cluster partnership - Cluster partnership members (i.e. cluster organisations) - Cluster organisation members
	Number of new/adapted products launched through cluster support	- Cluster partnership - Cluster partnership members (i.e. cluster organisations) - Cluster organisation members
Business activities	Impact of the work of the cluster partnership on business activities of the related cluster organisation members	- Cluster partnership - Cluster partnership members (i.e. cluster organisations) - Cluster organisation members
	Impact of the business-oriented services of the cluster partnership on related cluster organisation members	- Cluster partnership - Cluster partnership members (i.e. cluster organisations) - Cluster organisation members
	Perceived value of services	- Cluster partnership members (i.e. cluster organisations)
	Number of new start-ups generated minus number of businesses closed in cluster area	- Local, Regional Governments
Sales	Percentage of incremental revenue of cluster partnership related cluster organisation members on an annual basis	- Cluster partnership - Cluster partnership members (i.e. cluster organisations) - Cluster organisation members
	Incremental economic growth contributed to cluster partnership activities	- Local, Regional Governments
External cooperation	Number of external cooperation requests received by the cluster partnership	- Cluster partnership - Cluster partnership members (i.e. cluster organisations)
Internationalisation activities	Degree of internationalisation of cluster partnership participants: cluster organisations and cluster organisation members	- Cluster partnership - Cluster partnership members (i.e. cluster organisations) - Cluster organisation members
	Impact of the work of the cluster partnership on international activities of the cluster partnership members	- Cluster partnership - Cluster partnership members (i.e. cluster organisations)
	Number of foreign based businesses established in the cluster partnership regions due to cluster partnership activities	- Local, Regional Governments - Cluster partnership
Visibility	Number of media references, articles, etc.	- Cluster partnership - Cluster partnership members (i.e. cluster organisations)
	Cluster membership satisfaction	- Cluster partnership members (i.e. cluster organisations)
	Key stakeholder satisfaction	- Stakeholders

*Source: authors based on (Christensen et al., 2012; European Secretariat for Cluster Analysis (ESCA); United Nations Industrial Development Organization, 2012)*

## Annex B - Examples of good practices

This annex adds a selection of further good/best practice examples of influential evaluations that show how the different elements described in Smart Guide have been assembled to constitute a unique evaluation design. The rationale for choosing these examples is the following:

- B1 – Pôles de compétitivité / Competitiveness clusters (France): illustrates how a link is established between evaluation results and funding
- B2 – Vinnväxt programme (Sweden): shows an attempt to capture system-level effects
- B3 – Basque country cluster policy (Spain): provides an example of participatory approach applied to cluster policy evaluation.

For each selected case, the main methodological and organisational features are reported, showing advantages and limits, as well as the consequences for policy learning.<sup>26</sup>

### B1. France

PÔLES DE COMPÉTITIVITÉ (COMPETITIVENESS CLUSTERS)	
<b>Cluster Policy</b>	<p>In 2004/2005, the French central government has introduced the “Pôles de Compétitivité” (competitiveness clusters), a large-scale national cluster policy at the intersection of several thematic policies, including research &amp; development and innovation, industry and territorial development. The poles are defined as “gatherings of small, medium or large enterprises, research laboratories and training/academic institutions, on a well-identified territory and targeting a specific thematic”. The key objectives of this policy have been the promotion of innovation and industrial competitiveness. It has also de facto retained attention to territorial balance, by attributing the Pole status to organisations on the entire French metropolitan territory.</p> <p>In 2018, 71 competitiveness clusters (pôles de compétitivité) were identified and benefited from national support, a number reduced to 56 since 2019 (including 8 with a temporary status, depending on their ability to fully meet selection criteria after a short transition period). The poles are heterogenous in terms of regional location, scale, level of maturity, sectors (e.g. biotechnology, ICT, aerospace, nuclear power, cosmetics, crop/plant science) and operational objectives. Despite the high number of poles selected, national financial support is highly concentrated on a few poles considered as having potential for “world-class” impact.</p> <p>The policy has gone through <b>four different phases</b> since its inception, with adjustments linked to the conducted evaluations (see dedicated section):</p> <ul style="list-style-type: none"><li>• <b>Phase 1 (2005-2008):</b> Initial phase of the policy, Poles considered as <i>usines à projets</i> (“projects’ factories”), i.e. focusing on collaborative R&amp;D projects (though the actual priorities of individual poles tended to be diverse)</li><li>• <b>Phase 2 (2009-2012):</b> Generalisation of performance contracts and roadmaps between the central government, regional authorities and poles (including strategies, priority for actions, goals etc.)</li></ul>

<sup>26</sup> Other sources of useful references to specific examples of cluster policy evaluation are in (Müller et al., 2012; Wise et al., 2009).

## PÔLES DE COMPÉTITIVITÉ (COMPETITIVENESS CLUSTERS)

- **Phase 3 (2013-2018):** Shift towards poles as *usines à produits* (“products’ factories”), highlighting the objective of commercialisation of innovative services and products, reflections on potential mergers, more balanced governance between national and regional authorities.
- **Phase 4 (2019-2022):** Continued orientation of the poles towards the creation of innovative products, mergers of poles (56 in 2019), reduction of the direct central government financial support to poles, transition towards performance-based funding, increased importance of EU funding, shift in the governance of the poles away from the central government towards regional governance.

### Methodology

A series of officially mandated evaluations have been carried out regarding the pôles de compétitivité policy, on the three first phases. They have been conducted during and after the completion of the phases (in-itinere or ex-post). The methodologies of these evaluations have relied on a mix of qualitative and quantitative approaches, including interviews, visits in the different poles, surveys and data analysis. These **evaluations** have been realised by external consultants.

- **Phase 1 (2005-2008):** Consultants from the BCG and CM International compiled information at the cluster organisation (pole) and aggregate level (synthetic report on the national policy). They conducted field visits to the poles, interviews and data collection on projects and performance.
- **Phase 2 (2009-2012):** Consultants from Bearing Point, Erdyn and Technopolis compiled information at the cluster organisation (pole) and aggregate level (synthetic report on the national policy). They used individual and collective interviews, field visit, online surveys and data analysis (Poles and their members). Individual poles were evaluated based on common criteria (linked to their status) and additional individual objectives mentioned in the performance contracts (established since 2009).
- **Phase 3 (2013-2018):** in contrast with previous phases, consultants from EY, Technopolis and Erdyn conducted an evaluation only at the level of individual cluster organisations (pole). Methods included interviews, field visits to the poles and data collection for several indicators. Pole directors and managers had the possibility to review the proposed report for comments. Moreover, France Stratégie (advisory body to the Prime Minister) has evaluated the impact of the policy on R&D private effort econometrically, finding positive results.

These evaluations have yielded insights, that have been largely incorporated into the adjustment of the following phases, though not entirely (see the challenges and lessons learnt sections).

The methodology of evaluation is partially linked to monitoring. These linkages have improved since the 2009-2012 phase (introduction of performance contracts between the poles and the authorities), with several indicators developed offering insights for evaluation.

	Evaluation of PHASE 2			Evaluation of PHASE 3		
<b>Categories of indicators</b>	Effects of R&D projects established within the cluster	Direct impacts on firms and institutions, members of clusters	Macro-economic impacts	Usine à projets (projects' factories)	Usine à produits (products' factories)	Economic impact
<b>Indicators</b>	Number of patents and intellectual property rights filed by actors involved in clusters, which received funds between 2008 and 2011	Effect of the membership in the cluster on the firms' turnover	Influence of clusters' creation on the implementation and management of regional industrialisation and new strategic thinking	Number of FUI projects certified 2013-2015, every 10 cluster members	Number of intellectual property rights filed 2013-2015, every 10 cluster members	Evolution of the number of members between 2012-2015
	Number of start-ups created between 2008-2011	Influence of cluster organisations in jobs creation	Relation between cluster membership and the degree of internationalisation	Number of FUI projects funded 2013-2015, every 10 cluster members	Number of innovations 2013-2015, every 10 cluster members	Share of private funds in the cluster organization budget
	Number of projects which lead to innovation on the basis of cluster category and type of innovation	Relations between clusters' membership and increasing investments in R&D activities	Relation between clusters presence and bonds strength among firms, institutional agencies and educational centers in the regional and local scenario and increasing collaboration between SMEs and big companies	Number of projects funded 2013-2015, every 10 cluster members	Type of support to SMEs within the cluster organization	Share of the management budget addressed to public services mission
	Number of scientific publications by actors of clusters, which received funds between 2008-2011	Number of collaborations among universities, research centers and educational institutions and clusters	Increasing degree of coherence among cluster policies and other innovation policies	Number of projects guided by cluster 2013-2015, every 10 cluster members		Time spent by cluster team to put in action activities between 2012-2015
		Share of amount provided by FUI and ANR to public research institutes through the clusters' projects	Cluster support to workforce professionalisation	Total amount of budget for 2013-2015 projects, every 10 cluster members		
		Effect on the firms' exportation and cluster membership	Cluster membership and improvement of the financial environment			
		Effect of cluster membership on firms' capacity to make agreements with other companies				

<p><b>Challenges</b></p>	<ul style="list-style-type: none"> <li>• Lack of metrics usable to estimate the actual economic impacts of the poles, even if the situation of indicators has improved since the 2009-2012 phase (performance contracts).</li> <li>• Difficulty to obtain harmonised, homogeneous and reliable data from different funding sources, since projects are sometimes backed by several institutions. Data on more qualitative dimensions, such as networking are also difficult to retrieve accurately, making comparisons between poles and aggregate analysis challenging.</li> <li>• Time-scale issue: the majority of expected effects of the Poles might only be observable in the medium to long-term.</li> <li>• Diversity of the pôles de compétitivité in terms of scope and level of development: the choices of indicators might not correspond to the individual priorities of poles and tend to favour innovation-related metrics, rather than networking effects.</li> <li>• Difficulties to implement some of the recommendations, such as the termination of the pôles de compétitivité status for organisations falling to meet the objectives even if in the long-run, a process of mergers of poles takes place.</li> <li>• Limited transparency and participatory approach in some phases of evaluations, including on the definition of indicators and the publication of the full results of evaluations.</li> </ul>
<p><b>Lessons learnt</b></p>	<ul style="list-style-type: none"> <li>• The official evaluations of the policy are management-oriented and follow its different phases, making possible to measure mid-term impacts and to adjust the following phases.</li> <li>• The policy could be more flexible to account for the diversity of Poles. This raises issues regarding the clarity of the overall objectives, governance and evaluation criteria/metrics.</li> <li>• Recent econometric evaluations have shown first positive results of Pole membership in terms of private R&amp;D, following inconclusive findings in the shorter-term.</li> <li>• Official evaluations of the three first phases reached consensual results concerning the approach and potential of the policy, while suggesting concrete room for improvement (e.g. classification of poles, integration with other relevant policies, focus on commercialisation...). Some of the recommendations issued by the consulting groups at the end of the first and the second phases have been implemented, such as change in the cluster categorisation system, creation of internal roadmaps and strategies for each cluster organisation, or the necessity to make a mid-term evaluation at the cluster level.</li> <li>• However, commitment to take into consideration the evaluations' results and recommendation has not been total, especially regarding the discontinuation of support to the least performing poles.</li> <li>• Focus on transparency of evaluation and integration of all relevant stakeholders in the different stages of the process could mitigate tensions on the future of cluster policies.</li> </ul>

## B2. Sweden

VINNVÄXT PROGRAMME	
<b>Cluster Policy</b>	<p>In 2001, Vinnova started the national cluster programme in Sweden called “Vinnväxt – Regional Growth through Dynamic Innovation Systems”. Vinnväxt’s mission is to promote sustainable regional growth by developing internationally competitive research and innovation milieus in specific growth fields. Vinnväxt also wants to catalyse a broader transformational change in society, towards innovation-driven sustainable growth in the Swedish regions.</p> <p>Some 230 initiatives have applied for funding under Vinnväxt’s five calls. Of these, 18 (“functional”) regions have been declared winners. Funding of up to EUR 1 million per year for 10 years is available, while winning regions must contribute at least the same amount. Winners are also offered “process support” in the form of seminars, coaching, follow-up and experience-sharing. Since 2013, more flexible financing over time takes place for each Vinnväxt initiative and a stronger focus is placed on sustainable development, green growth and societal benefits.</p> <p>Vinnväxt winners are evaluated every three years by international experts. A recent monitoring study is available: <a href="https://www.vinnova.se/publikationer/vinnvaxt-at-the-halfway-mark/">https://www.vinnova.se/publikationer/vinnvaxt-at-the-halfway-mark/</a></p>
<b>Methodology</b>	<p>Following the evaluation of the first batch of clusters, an ex-post evaluation took place in 2016.<sup>27</sup> With the focus of the programme being developing dynamic innovation systems, the objective of cluster evaluation has been on understanding how these systemic upgrading and renewal processes work and how their effectiveness can be improved.</p> <p>The evaluation process relies on four main elements: ex-ante evaluation, (report submitted to Vinnova by cluster managers); regular monitoring through biannual reports from cluster managers, regular dialogues and workshops; interim evaluations by external international evaluators after 3 and 6 years of the contract period; and an ex-post evaluations (of system impacts) two years after the end of the contract period.</p> <p>The first ex-post evaluation (<i>Effektanalys av Vinnväxt-programmet – Analys av effekter och nytta</i>) was conducted by the consultancy Kontigo AB and published in April 2016. The analysis was based on data from the 12 Vinnväxt initiatives that had begun to receive financing during the period 2003-2008. Data was collected and analysed through a variety of methods:</p> <ul style="list-style-type: none"><li>• Review and analysis of previous evaluations as well as of quantitative and qualitative data collected through annual reporting to Vinnova;</li><li>• Review and analysis of regional and national policy documents;</li><li>• 120 interviews with key actors involved in Vinnväxt initiatives, researchers who followed Vinnväxt initiatives, and with regions who did not have a Vinnväxt cluster;</li><li>• Survey to companies participating in Vinnväxt initiatives;</li><li>• Statistical analysis of regional economic benchmarking data and company data (including data for both participating companies and control group companies); &amp;</li><li>• Statistical analysis of patent data, and a bibliometric study.</li></ul>

<sup>27</sup> See Cooke et al. (2011), Uyarra and Ramlogan, (2012), Uyarra and Ramlogan (2016).

## VINNVÄXT PROGRAMME

<b>Indicators</b>	<p>The evaluation analysed the results for each of the three kinds of stakeholders in the triple helix. For <i>policy makers</i>: provision of new, innovative tools for dialogue and collaboration; 'puts regions on the map'. For <i>research and higher education institutes</i>: Vinnväxt environments attract leading researchers; contributes to development at research centres and universities; contributes to increased quality and quantity of research expenditures. Concerning <i>company performance</i>, statistical indicators on revenue, employment, productivity and export of participating "cluster companies" were compared to similar companies in a "control group". The evaluation showed that the cluster companies have had a more positive development compared to the control group.</p>
<b>Challenges</b>	<p>The system-level effects are more difficult to quantify, and the assessment of effects at this level is mostly based on perceptions. A more structured and quantitative approach to system-level effects will be a focus of future monitoring and evaluation activities and further learning to improve the Vinnväxt programme.</p>
<b>Lessons learnt</b>	<ul style="list-style-type: none"> <li>• The evaluation provides insights to the effect of the Vinnväxt programme on the <i>capacity of cluster companies</i> to innovate and collaborate capacity, and on <i>economic indicators</i>: stronger growth in revenue, employment, productivity and export in comparison to peer companies outside the Vinnväxt clusters.</li> <li>• The analysis also highlights that <i>companies who are most strongly engaged</i> in cluster initiatives experience stronger results compared to those companies who have lower engagement.</li> <li>• For the other actors in the cluster initiatives such as <i>academic institutions and public sector actors</i>, the evaluation has revealed effects in terms of positive changes on the system level (including strengthened resilience and capacity to manage structural change).</li> </ul>

### B3. Basque country case

BASQUE COUNTRY CLUSTER POLICY	
<b>Cluster Policy</b>	<p>Basque country was a pioneer in adopting a targeted, cluster-based industrial policy in Europe. Implemented by cluster organisations, the Basque cluster policy concerned 11 priority clusters and (originally) 11 'pre-clusters' in energy, advanced manufacturing and biosciences - the strategic priorities established in the Regional Smart Specialisation Strategy RIS3.</p> <p>Considered a valuable instrument for the industrial policy due to its capability to generate added-value for the region by aligning their actions with the strategic policies, Basque cluster organisations are coordinated by the Basque Development Agency (SPRI), which facilitates the communication flow and monitors the cluster organisations' annual action plans and their strategic plans (obligatory since 2000). This case is about a methodology developed and tested in one of the Basque clusters. This approach has not been applied to all clusters, but it did influence the approaches that have since been developed and helped to embed some of the principles of participatory approaches to evaluation in the Basque Country. For example, the current 'voice of users' survey that is used as part of the evaluation approach in Basque Country, and is adopted by the Interreg Europe Platform (See: <a href="https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1501_851378.pdf">https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1501_851378.pdf</a>).</p>
<b>Methodology</b>	<p><b>Participatory cluster policy evaluation</b></p> <p>Participatory cluster policy evaluation can overcome some of the limits of traditional evaluations. Unlike conventional, empirical methods exclusively focused on quantitative data (that demonstrate changes in the economic performance of companies and regions in response to policy measures), the participatory evaluation gives stakeholders the opportunity to reflect together on the results they pursue and their achievements. This comprehensive approach has two objectives:</p> <ul style="list-style-type: none"> <li>(i) Diagnose and better understand the socio-institutional context relevant for the clusters at which the policy is directed at; and</li> <li>(ii) Evaluate the policy and its interactions with its context in a long-term process that can generate policy learning outcomes.</li> </ul> <p>A participatory evaluation methodology was developed specifically for the Basque country and tested with one of the cluster associations, namely the aerospace cluster Hegan. The development process was led by a research team (Aragón, Aranguren, Iturrioz and Wilson, 2011) and structured in four phases:</p> <p><b>Phase 1: Planning and model development</b></p> <p>In order to define a common vision and the scope of the evaluation, the main stakeholders identified <i>two core aims</i> of the cluster policy, namely:</p> <ul style="list-style-type: none"> <li>(i) Fostering competitiveness through collaboration, and</li> <li>(ii) Importance of social capital in policy development.</li> </ul> <p>The defining of the key evaluation questions followed. These corresponded to challenges, which could only be faced through cooperation within the cluster organisation, namely: qualitative growth of the cluster to consolidate the value chain, innovation and generation of new products, adaptation to new technologies, training and identification of best practices, financing of projects, internalisation of the cluster's</p>

## BASQUE COUNTRY CLUSTER POLICY

philosophy, internationalisation and new clients, improvement of communication within the cluster, and strengthening the design of government support programmes. Based on these outcomes, the research team built an evaluation framework which followed a series of principles: shared definition of qualitative and quantitative indicators among stakeholders, non-exhaustive, quantifiable, dynamic and easily available indicators able to reflect the principal impacts and the elements behind them and guide the evolution of the cluster.

The framework was structured around *four sets of indicators*: drivers, facilitators, results and outcomes. Finally, the evaluation framework was presented for discussion in a workshop. This resulted in the approval of the final evaluation model.

### **Phase 2: Data collection and processing**

Data to construct the Network Policy Outcomes and Social Capital indicators was collected through an ad-hoc online evaluation survey addressed to all cluster members.

### **Phase 3: Learning process**

The data collected was analysed and presented to stakeholders. This served as a basis for designing action plans that allowed for the future development of the cluster organisation, which has the necessary information to define strategies that build on the strengths and address the challenges identified by its performance and social capital indicators.

### **Phase 4: Dissemination**

The dissemination aimed to highlight the benefits of this approach to other clusters enabling a smooth extension of the initial pilot project. For instance, the research team trained the staff of cluster organisations so they could implement the methodology themselves. It also supported further research and refinement of the methodology along the years.

## Indicators

The evaluation framework was established around *three evaluation components* with their corresponding indicators, as defined by the stakeholders:

**1. Network Policy Outcomes** - measure the level of accomplishment of the specific behavioural changes that the cluster policy aims to promote.

- **Associative maturity**: degree of advancement in the development of strategic projects in cooperation. The indicator is measured through a 12-item questionnaire that positions each participant in the key progress stages defined, towards the final cluster policy purpose of working together in strategic cooperation projects.
- **Observed projects** in cooperation among the cluster organisation: number of projects, nature of the projects and perceived added-value.

**2. Social Capital** - measures the existing social capital within the cluster organisation, articulated in three dimensions.

- **Relational dimension**: measures trust, reciprocity and commitment
- **Cognitive dimension**: measures shared vision, the perception of the agents on the commonalities of goals in the network, and reasons for belonging to the network
- **Structural dimension**: measures the network itself, in terms of actual and desired relationships

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	<p><b>3. Results and Impact</b> - combined due to the longer time scale for data collection and their coherence with the parallel and ongoing strategy of cluster organisations.</p> <ul style="list-style-type: none"> <li>• <b>Results:</b> level of achievement of the key strategic objectives established in the strategic plan, in line with the result indicators set in the initial proposal, i.e. consolidation of the value chain, innovation and technological adaptation, training, finance and internationalisation.</li> <li>• <b>Impact:</b> overall impact of the activity of the cluster organisation in the development of the region, i.e. productivity, growth and critical mass.</li> </ul> <p>Note: These indicators might vary slightly according to the stakeholders involved, respecting the uniqueness of every cluster and region. The indicators presented here were extracted from the participatory evaluation pilot implemented within the Hegan cluster.</p>
<b>Challenges</b>	<ul style="list-style-type: none"> <li>• Maintenance of continuous active participation from stakeholders through the evaluation process, especially when their institutional elements of the scenario are weak.</li> <li>• The emergence of a co-located productive structure and the development of social capital among its main agents are the central prerequisites to foster cooperation dynamics and, therefore, <i>sine qua non</i> conditions for using a participatory evaluation.</li> <li>• In a context where there is a cluster and functioning institutional elements, the evaluation process needs to be carefully aligned with the already established policy process and engage the existing institutional elements to avoid crowding out.</li> </ul>
<b>Lessons learnt</b>	<ul style="list-style-type: none"> <li>• Importance of combining empirical methods with (i) a detailed understanding of the policy itself and where it fits into the overall system of policies that coexist in a particular territory; and (ii) detailed case analysis aiming to unfold further information about company behaviour and motivation with respect to the policy.</li> <li>• It is essential to ensure inclusiveness in the process, which involves defining who should participate and check if it raised interest and active participation among relevant stakeholders.</li> <li>• The participatory evaluation generates valuable learning for the continuous adaptation of policies to the changing socio-economic reality, particularly relevant for regional policy-making. Ongoing evaluations are formative in nature, enabling policy learning through the life span of the policy.</li> <li>• This evaluation process addresses the so-called intangible outcomes and favours democratisation in policy making, bringing together strategic decision making and the objectives of the actors affected by those decisions.</li> <li>• It is critical to effectively communicate the nature and value of the evaluation process from the beginning so that participants feel there is a need for such an evaluation, taking into consideration: (i) the maturity of the cluster context and its participatory culture; and (ii) the perceptions of the different stakeholders regarding the benefits they will obtain from the process.</li> <li>• This approach has been proved to influence the adaptation of other policies to the real need of companies and to improve the level of knowledge among companies about public policies.</li> </ul>

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- The convergence of public policies in a territory makes evaluation processes an important tool to support the integration of those policies, creating a better context to generate positive outcomes.
- In a scenario where there is a cluster but weak institutional elements, a participatory evaluation can help in building the lacking socio-institutional context. The process can support the definition of strategic challenges and encourage interactions among stakeholders.

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# European Observatory for Clusters and Industrial Change

The European Observatory for Clusters and Industrial Change (#EOCIC) is an initiative of the European Commission's Internal Market, Industry, Entrepreneurship and SMEs Directorate-General. The Observatory provides a single access point for statistical information, analysis and mapping of clusters and cluster policy in Europe, aimed at European, national, regional and local policy-makers, as well as cluster managers and representatives of SME intermediaries.



The aim of the Observatory is to help Europe's regions and countries design better and more evidence-based cluster policies and initiatives that help countries participating in the COSME programme to:

- develop world-class clusters with competitive industrial value chains that cut across sectors;
- support Industrial modernisation;
- foster Entrepreneurship in emerging industries with growth potential;
- improve SMEs' access to clusters and internationalisation activities; and
- enable more strategic inter-regional collaboration and investments in the implementation of smart specialisation strategies.

In order to address these goals, the Observatory provides an Europe-wide comparative cluster mapping with sectoral and cross-sectoral statistical analysis of the geographical concentration of economic activities and performance, made available on the website of the European Cluster Collaboration Platform (ECCP)<sup>28</sup>. The Observatory provides

the following services:

- **Bi-annual "European Panorama of Clusters and Industrial Change"** that analyses cluster strengths and development trends across 51 cluster sectors and 10 emerging industries, and investigates the linkages between clusters and industrial change, entrepreneurship, growth, innovation, internationalisation and economic development;
- **"Cluster and Industrial Transformation Trends Report"** which investigates the transformation of clusters, new specialisation patterns and emerging industries;
- **Cluster policy mapping** in European countries and regions as well as in selected non-European countries;
- **"Regional Eco-system Scoreboard for Clusters and Industrial Change"** that identifies and captures favourable framework conditions for industrial change, innovation, entrepreneurship and cluster development;

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<sup>28</sup> <https://www.clustercollaboration.eu/>

- **Customised advisory support services** to twelve selected model demonstrator regions, including expert analysis, regional survey and benchmarking report, peer-review meeting, and policy briefings in support of industrial modernisation;
- **Advisory support service to European Strategic Cluster Partnerships**, in order to support networking between the partnerships and to support exchanges of successful practices for cross-regional collaborations and joint innovation investments;
- **Smart Guides** for cluster policy monitoring and evaluation, and for entrepreneurship support through clusters that provide guidance for policy-makers; and
- **Brings together Europe's cluster policy-makers and stakeholders** at four European Cluster Policy Forum events, European Cluster Days, and at the European Cluster Conference In order to facilitate high-level cluster policy dialogues, exchanges with experts and mutual cluster policy learning. Two European Cluster Policy Forums took place in February and April 2018, the third one will take place on 15 November in Brussels. The European Cluster Conference is scheduled for 14 to 16 May 2019 in Bucharest (Romania).
- Online presentations and publications, discussion papers, newsletters, videos and further promotional material accompany and support information exchanges and policy learning on cluster development, cluster policies and industrial change.

More information about the European Observatory for Clusters and Industrial Change is available at: <https://www.clustercollaboration.eu/eu-initiatives/european-cluster-observatory>



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