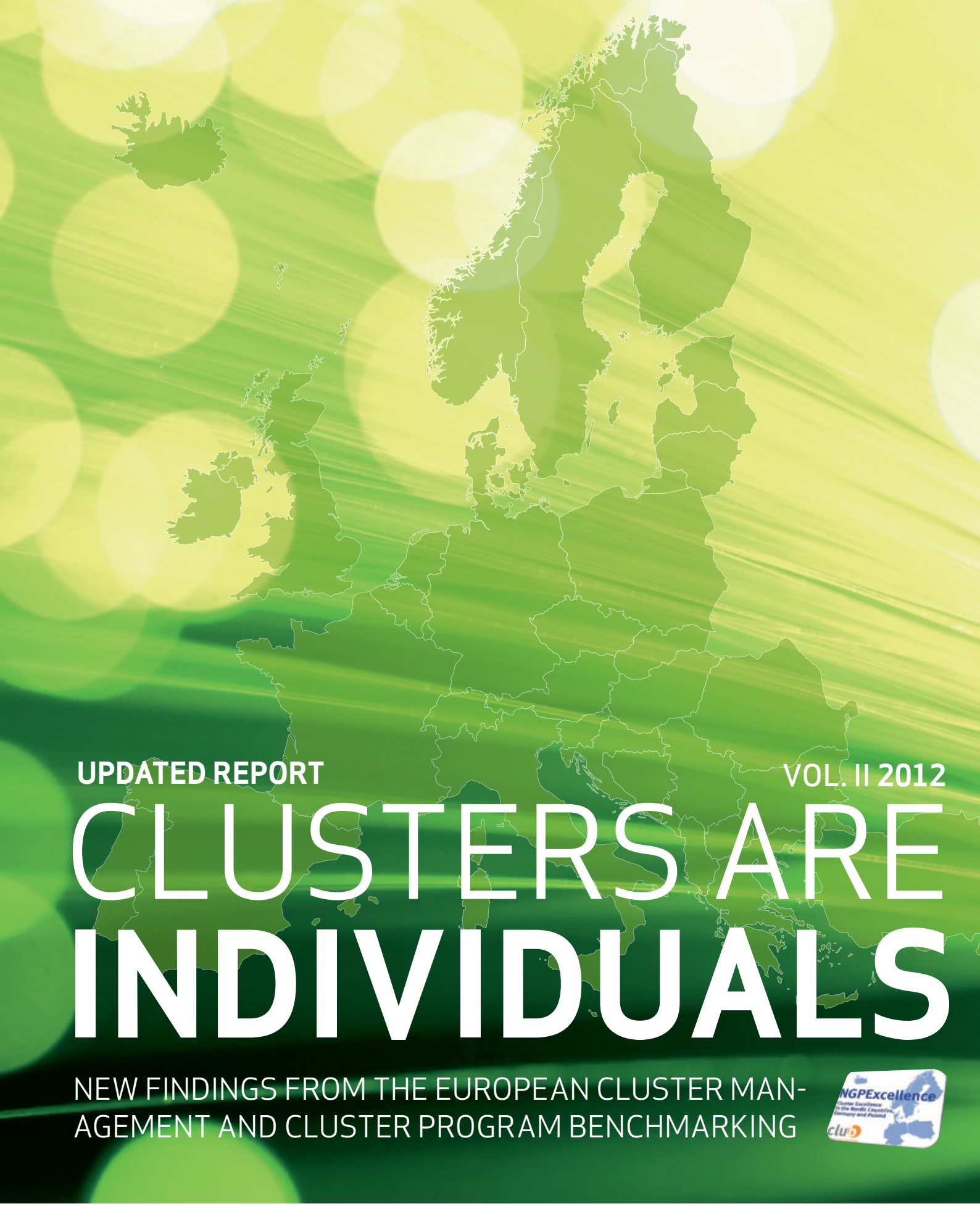

UPDATED REPORT

VOL. II 2012

CLUSTERS ARE INDIVIDUALS

NEW FINDINGS FROM THE EUROPEAN CLUSTER MANAGEMENT AND CLUSTER PROGRAM BENCHMARKING

Ministry of Science, Innovation and Higher Education

VDI | VDE | IT

Bundesministerium für Wirtschaft und Technologie

COLOPHON

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NEW FINDINGS FROM THE EUROPEAN CLUSTER MANAGEMENT AND CLUSTER PROGRAM BENCHMARKING

NGPExcellence
Cluster Excellence in the Nordic Countries, Germany and Poland

UPDATE 2012

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The project was initiated by the Danish Ministry of Science, Technology and Innovation.
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ABBREVIATIONS OF CLUSTER PROGRAMS USED IN THE FIGURES

Table 1: Abbreviations for the cluster programs benchmarked in this study

COUNTRY	NAME OF PROGRAM	ABBREVIATION
AUSTRIA	Cluster Program Lower Austria	Lower Austria
BELGIUM	Competence Centres-Light Structures	Belg LS
	Cooperative innovation network integrated project	Belg VIS
CZECH REPUBLIC	Cooperation–Clusters	CZ
DENMARK	Innovation Networks Denmark (Innovationsnetværk Denmark)	IND
ESTONIA	Cluster Development Program	EST
FINLAND	Centre of Expertise Program (OSKE, Osaamiskeskusohjelma)	OSKE
	Strategic Centres for Science, Technology and Innovation (SHOK, Strategisen huippuosaamisen keskittymät)	SHOK
FRANCE	Grappe d'entreprises	Grappe
	Les Pôles de Compétitivité	PdC
GERMANY	Competence Networks Germany (Initiative Kompetenznetze Deutschland) (expired)	KOM
	Go-Cluster Initiative	Go Cluster
	Clusterpolitische Gesamtstrategie der Freien und Hansestadt Hamburg (Cluster Policy Strategy of the Free and Hanseatic City of Hamburg)	HH
	Cluster Offensive Bayern (Bavarian Cluster Initiative)	COB
	Zentrales Innovationsprogramm Mittelstand – Fördermodul Netzwerkprojekte (ZIM NEMO) (Central Innovation Program SME – Funding Module Network Projects)	ZIM
HUNGARY	Cluster Development Program of the New Széchenyi Plan	HU
ICELAND	Strategic Research Program for Centres of Excellence and Research Clusters (The Icelandic Centre for Research (Rannsóknamiðstöð Ðslands))	RANNIS
	Regional Growth Agreements (Vaxtarsamningur)	VAX
ITALY	Innovation Clusters Piedmont	Piedmont
LATVIA	Cluster Program	LAT

LITHUANIA	InnoCluster LT	LT
	InnoCluster LT+	LT+
LUXEMBOURG	Luxembourg Cluster Initiative	Lux
NORWAY	Norwegian Centres of Expertise (NCE)	NCE
	Arena Program (Arena-programt)	ARENA
POLAND	Polish Cluster Support Schemes: Support for the development of Supra-Regional Clusters and Cluster Creation in Eastern Poland	POL
PORTUGAL	Portuguese Operational Competitiveness Program - COMPETE	Compete
ROMANIA	Development of business support infrastructures of national and international interest (Competitiveness Poles)	CP, RO
	Support to the integration of SMEs in value chains and clusters (Clusters)	Clusters, RO
SERBIA	Serbian Cluster Development Support Program	Serbia
SLOVAKIA	Support to innovative industrial cluster organizations	SK
SPAIN	Cluster Development Catalonia	Spain Cat
SWEDEN	Vinnväxt	VINN
TURKEY	Support for the Improvement of International Competitiveness (UR-GE)	URGE, TR
UNITED KINGDOM	Knowledge Transfer Networks	KTN

EXECUTIVE SUMMARY

In economic and innovation policy the term „cluster" is usually used to explain geographical concentrations of economic and innovation activities. According to conventional wisdom clusters support economic development through the specialization of regions in activities within which companies gain higher productivity through accessing external economies of scale or other comparative advantages. During the past 15 years clusters and innovative (competence) networks have gained more and more importance as an element of economic development and innovation strategies of the European Union and its Member States. The analyses in this report challenge conventional wisdom of what drives development and innovation within a cluster. Based on the largest international analysis of its kind involving a simultaneous benchmarking of more than 260 cluster organizations and of cluster policies from 23 European countries it is found that the economic impacts of clusters depend on many more factors not related to the specialization of regions through the geographical concentration of the cluster than earlier research suggests. Cluster management excellence and the spectrum and frequency of business-related services of the cluster organization are important determinants for the impact of a cluster. The analyses of cluster organizations and cluster policies also show many other key determinants for the development and characteristics of a cluster such as internationalization activities, R&D activities, age, technology areas.

The overall objective is to contribute to the development of outstanding clusters through excellent management and excellent cluster programs. Conducted from October 2010 to September 2012 the project pays particular attention on the characteristics of cluster management organizations and their effects on cluster development. More than 260 cluster management organizations from 16 countries were benchmarked to base the analysis on a comprehensive comparative portfolio. 34 cluster programs from 24 countries supporting most of the analyzed cluster organizations were analyzed to facilitate a better understanding of successful strategies and mutual learning between the program owners and to develop recommendations for a "perfect" cluster program.

The Danish Ministry of Science, Technology and Innovation has initiated this project. The analyses were carried out by VDI/VDE Innovation + Technik GmbH. Invaluable support was given by the country experts of the benchmarked clusters and cluster programs in this report.

1 RESULTS OF THE BENCHMARKING OF CLUSTER MANAGEMENT ORGANIZATIONS

In order to understand the characteristics of cluster management organizations and their interaction with cluster stakeholders in more detail, 261 cluster management organizations have been benchmarked since November 2010. The results provide a detailed insight into cluster management organizations and clusters in terms of the structure of the cluster, cluster management and governance, financing, services provided by the cluster management organization and achievements and recognition of the cluster management organization.

This chapter presents the results of the benchmarking of cluster management organizations. The comparative portfolio is explained in chapter 1.1, while chapter 1.2 introduces the findings of the benchmarking in terms of the general characteristics of cluster management organizations and clusters. Chapter 1.3 analyses differences between cluster management organizations and clusters. Chapter 1.4 gives an insight into excellent cluster management organizations, while chapter 1.5 presents key determinants that decide about the effect a cluster on business activities of cluster participants.

1.1 COMPARATIVE PORTFOLIO

The comparative portfolio includes 261 cluster management organizations from 17 countries (see Figure 1) covering a broad range of technology areas respectively industries (see Table 2).

Figure 1: Participating countries

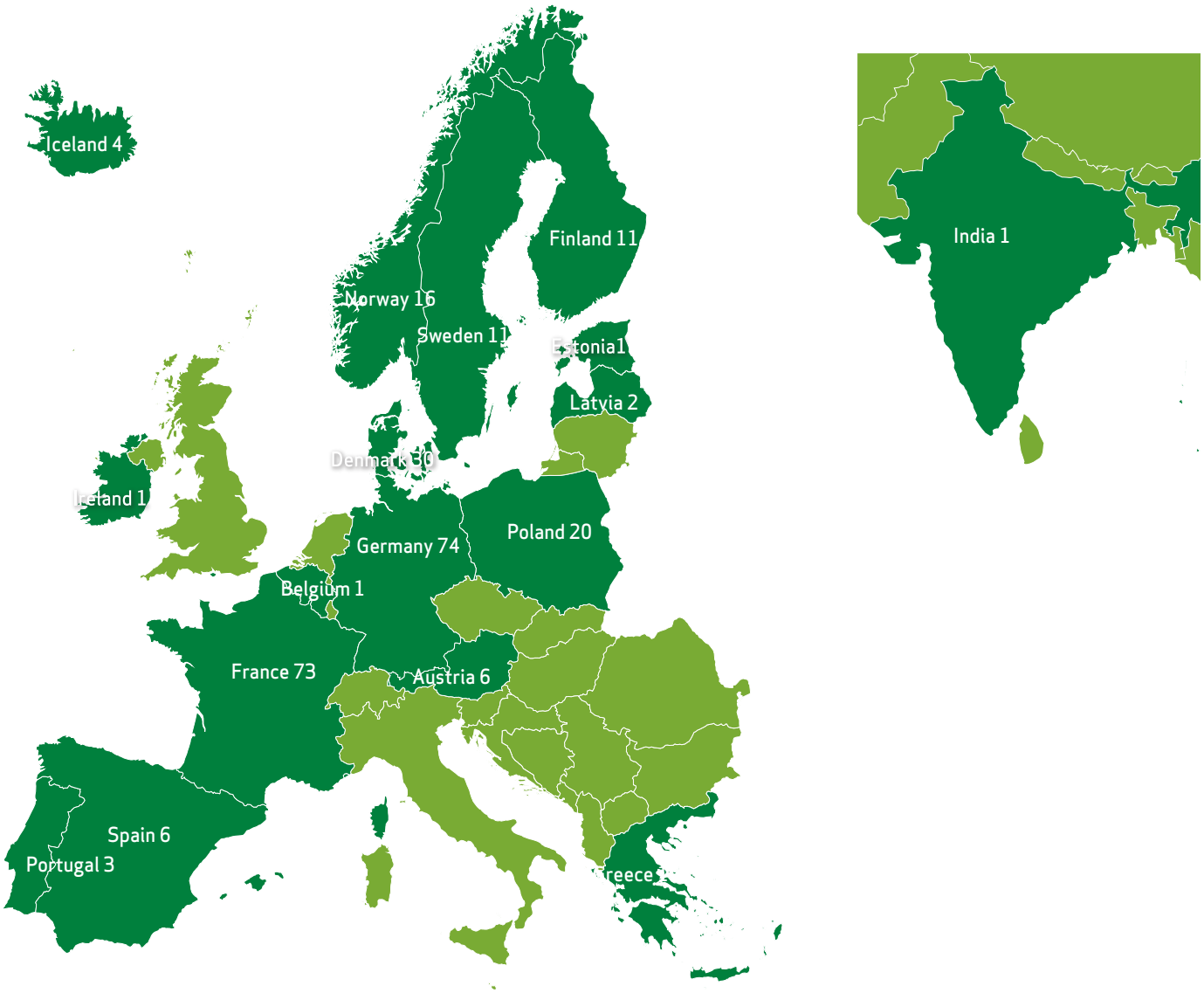


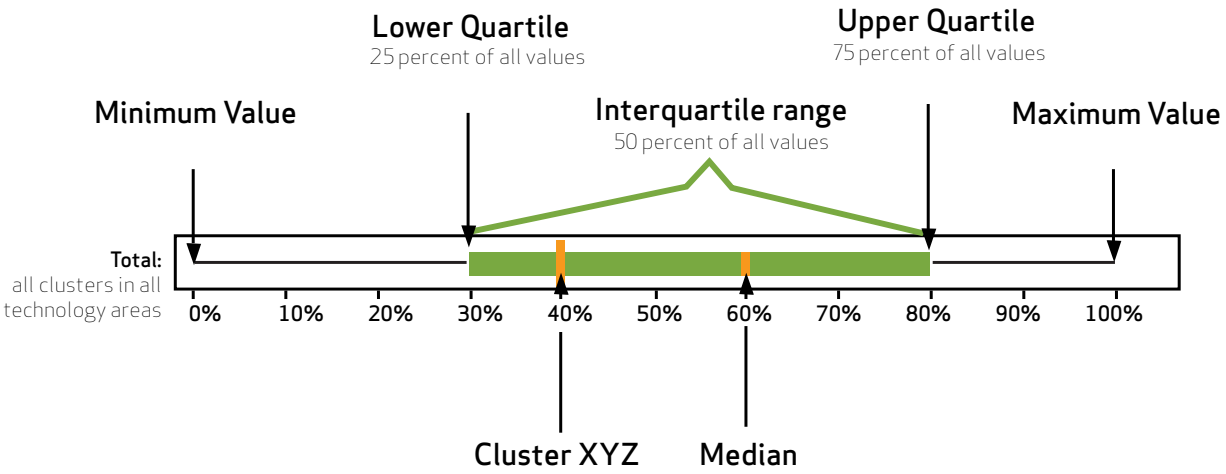
Table 2: Benchmarked clusters per country and technology area

TECHNOLOGY AREAS		Aviation and space	Biotechnology	Construction/building sector	Energy and environment	Food industry (non-biotech)	Health and medical science	Humanities/social sciences, media, design, service innovation	Information and communication	Micro, nano and optical technologies	New Materials and chemistry	Production and engineering	Transportation and mobility	TOTAL
COUNTRIES	AUS		1	1	1				1			2		**6**
	BEL					1								**1**
	DNK	1	1	1	4	2	2	5	5	1	2	3	3	**30**
	ESP				1		1	1	1			1	1	**6**
	EST								1					**1**
	FIN				3	2		1	2	1	2			**11**
	FRA	3	2	1	15	10	6	3	8	5	11	4	5	**73**
	GER	2	10		7	5	5	3	13	10	6	8	5	**74**
	GRC									1				**1**
	IND											1		**1**
	IRL								1					**1**
	ISL				2	1						1		**4**
	LVA								1				1	**2**
	NOR				2	1	2	2	1	2	1	5		**16**
	POL	2		2	4		2	3	3	1	1	1	1	**20**
	PRT					2			1					**3**
	SWE		2		2		1	1	**2**	1	1	1		**11**
	TOTAL	**8**	**16**	**5**	**41**	**24**	**19**	**19**	**40**	**22**	**24**	**27**	**16**	**261**

Box 1: Explanation of figures used to present the results of the benchmarking

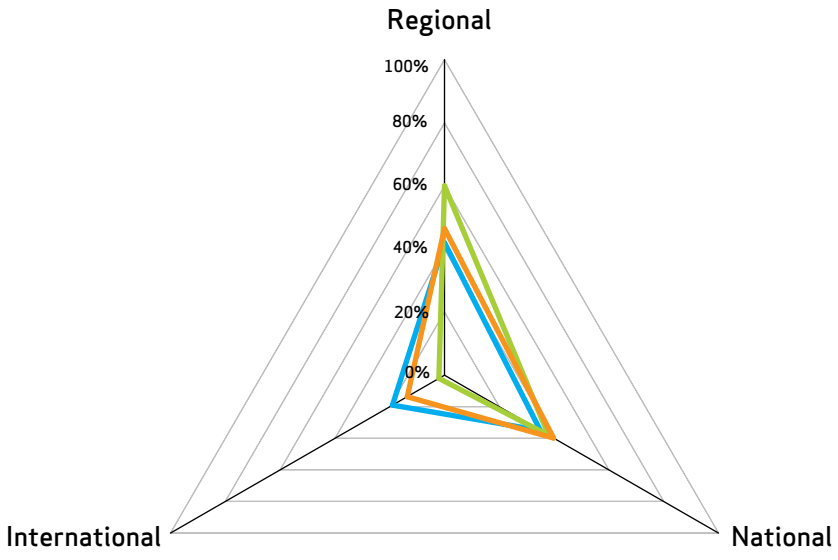
Boxplot

A boxplot presents the minimal and maximal values as well as the median of the results. The median is a numerical value separating the higher half of a sample from the lower half. The lower quartile covers the lowest 25 per cent and the upper quartile covers the lowest 75 per cent of the data. The difference between the upper and lower quartiles is called the interquartile range. It represents 50 per cent of the data.



Radar Chart

A radar chart is a graphical method of displaying multivariate data in the form of a two-dimensional chart of quantitative variables represented on axes starting from the same point. In the following example the data of the benchmarked cluster is indicated by a green line and compared to the data of the clusters in its specific technology area (orange line) and all technology areas (blue line).



1.2 GENERAL CHARACTERISTICS OF CLUSTER MANAGEMENT ORGANIZATIONS AND THEIR CLUSTERS

This chapter provides an overview of the general characteristics of cluster management organizations and their clusters for each country[1]. The overview includes data on

- The age of cluster management organizations,
- The size of clusters,
- The composition of clusters,
- The regional concentration of clusters and
- Financing of cluster management organizations.

1.2.1 AGE OF THE CLUSTER MANAGEMENT ORGANIZATION

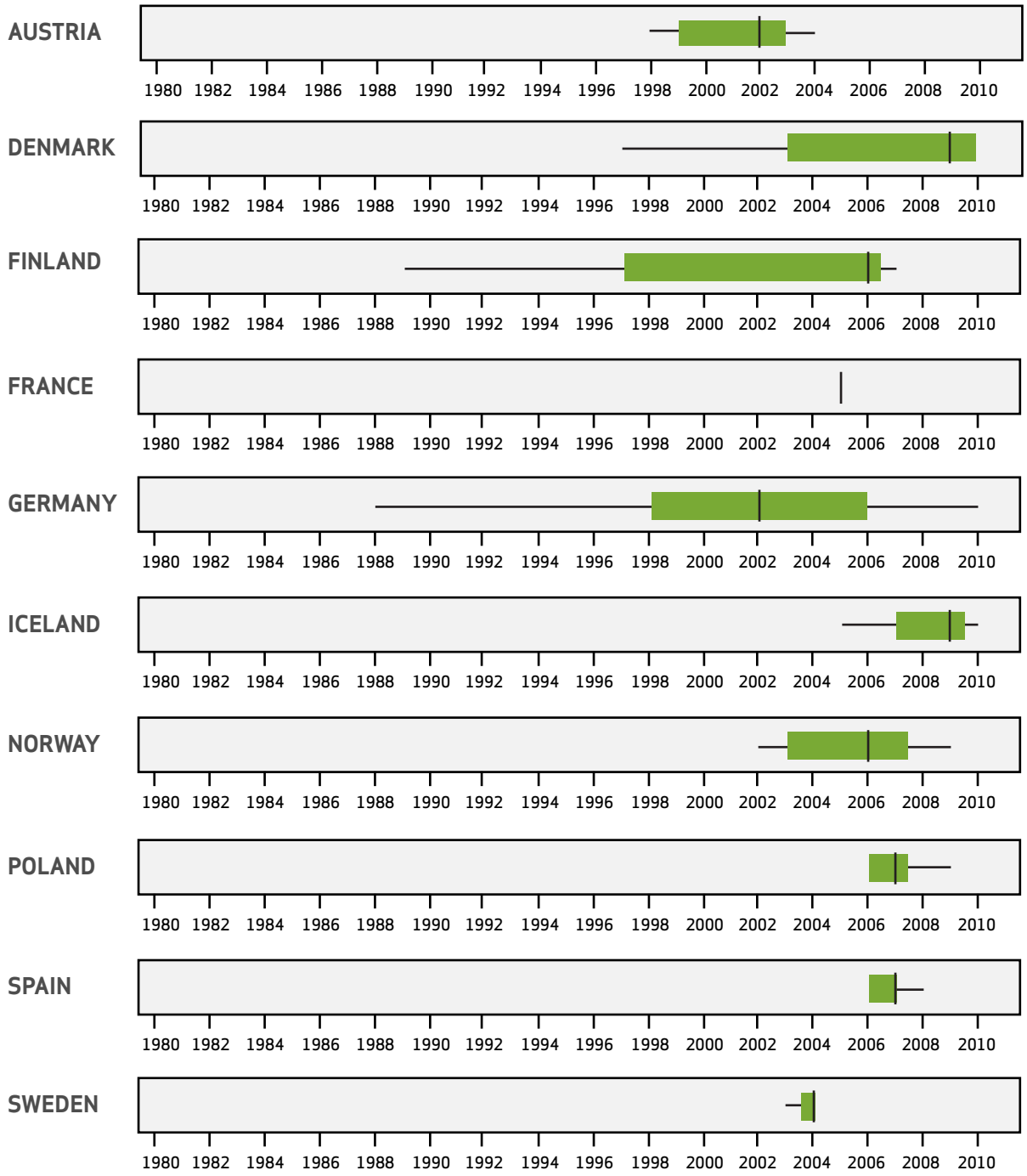
The establishment of the majority of cluster management organizations started in Austria, Germany and Finland already at the end of the 1990s followed by Denmark, France, Norway, Sweden, Spain Poland and Iceland (see Figure 2).

This pattern reflects the history of cluster policy in many of these countries. While, for example, cluster policy in Germany started in the mid-1990s resulting in a number of support programs both from the federal and regional level, in other countries cluster policy developed rather late at the beginning of the 2000s, like in Sweden, or even later, like in Iceland. As the majority of benchmarked cluster management organizations in their early phases relied heavily on public funding there is a clear correlation between the establishment and the inception of funding programs.

An interesting observation concerns the length of cluster institutionalization processes. While the majority of clusters in Germany were established during an eight-year period between 1998 and 2006, and in Finland between 1999 and 2007, this process was much shorter in other countries, e.g. in Poland just two years (2006 to 2008) or in Sweden just one year (2005). As this pattern cannot be explained by the influence of funding programs (e.g. through the publishing date of call for proposals) only – except for France where the Pôles de compétitivité program was launched in 2005 -, it is most likely that other dynamics such as specific developments in individual industries also had an effect on the date of establishment.

1 In order to get meaningful results the analysis includes only countries with more than four benchmarked clusters.

Figure 2: Year of establishment of the cluster management organization



1.2.2 SIZE OF CLUSTERS

For the purpose of this project the size of clusters was measured in terms of numbers of cluster participants who are committed to the work of the cluster management organization. A committed cluster participant is a company, R&D institution etc. who meets at least one of the following criteria:

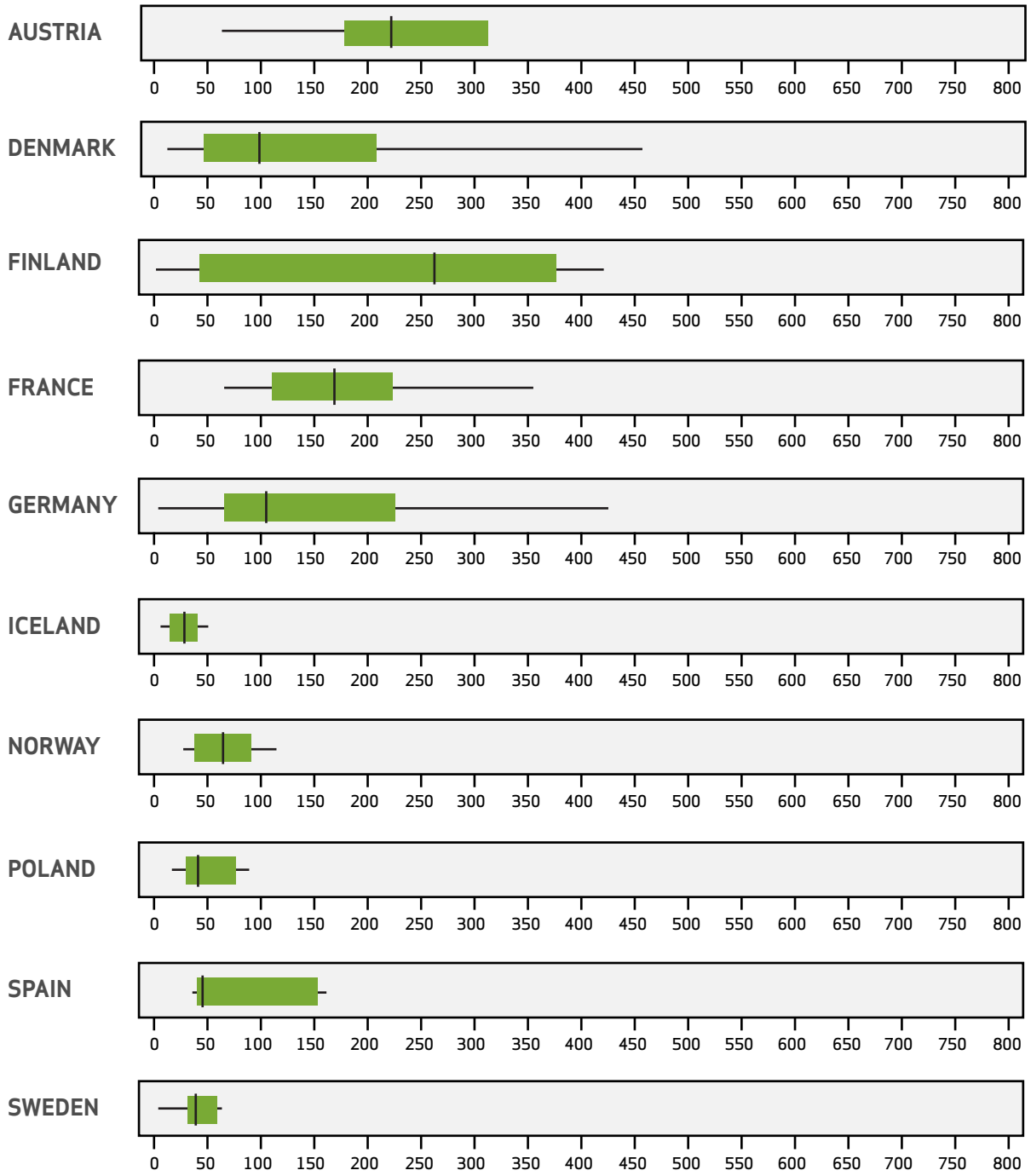
- The cluster participant has signed a membership agreement, a letter of intent or a similar form of written commitment;
- The cluster participant pays membership fee or provides financial support to the cluster management on a regular basis (this may also include inkind contributions or staff working time);
- The cluster participant contributes actively to the development of the cluster on a regular basis, e.g. through the participation in projects, workshops or working groups.

Figure 3 presents the composition of clusters in terms of total number of committed cluster participants. The total number includes participants from the following categories: SME[2] , Non-SME, R&D institutions, universities, training and education providers, financial intermediaries, consultants, governmental agencies and others. The size of a cluster does not correlate with its business and innovation potential or its utilization: it is the quality of the cluster participants that is important.

The size of a cluster does not necessarily depend on the size of the national economy. Although the economies of Germany and Denmark are very much different in terms of the numbers of economic players, clusters in these two countries have a similar size. The size of clusters in Poland is quite small given the size of the Polish economy; but clusters may further grow in the future given the very young history of these clusters since the establishment of the cluster management organization. Eventually there is of course a size limit set by the size of the economy as it has an influence on the number of players in economic sectors in which clusters can develop. The large size of Finish clusters can be explained by the fact the majority of the benchmarked clusters are rather coordination bodies of smaller clusters in the same economic field; in this particular case the funding program "OSKE – Centre of Expertise Program", which supports the cluster management organizations, had a significant effect on the size of the clusters.

2 Based on the SME definition of the European Commission (Recommendation 2003/361/EC regarding the SME definition) this benchmarking considers a company as a SME if it has no more than 250 employees.

Figure 3: Size of the clusters (total number of committed cluster participants)

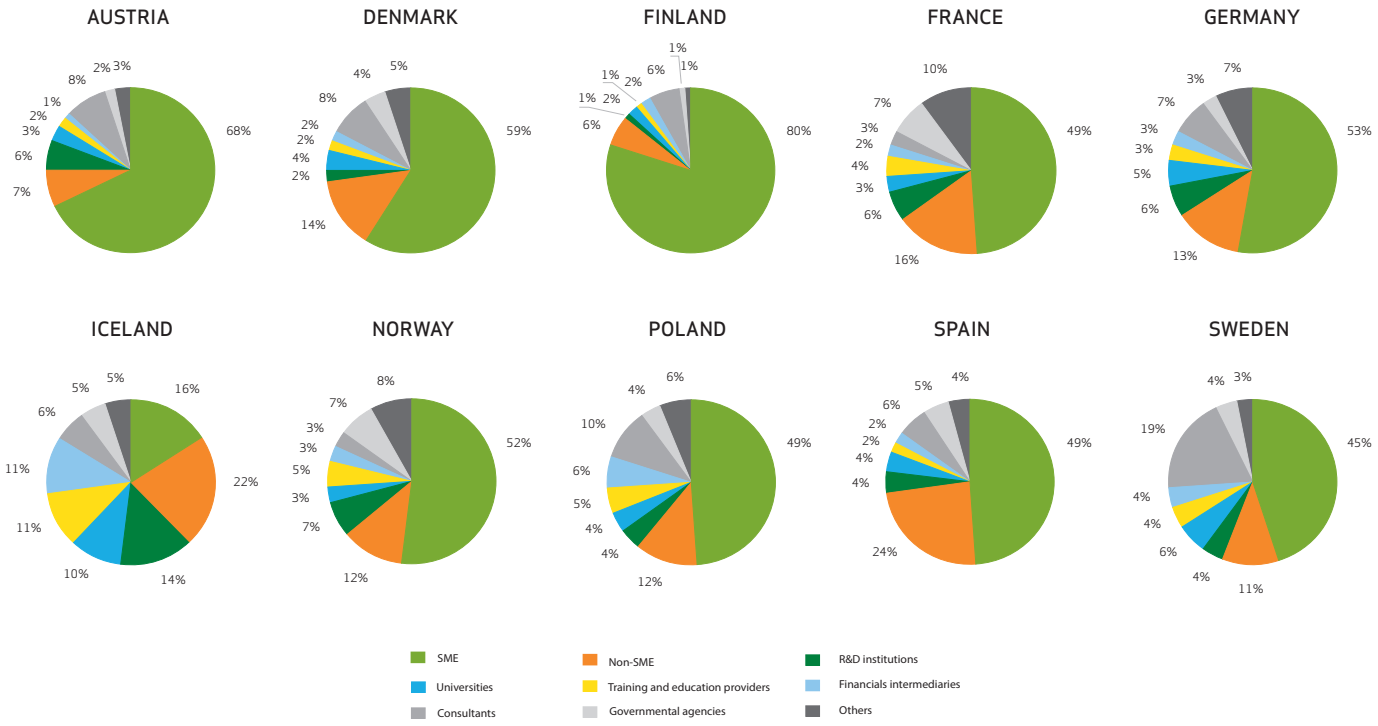


1.2.3 COMPOSITION OF THE CLUSTERS

Figure 4 displays the typical composition of a cluster for each country. With the exemption of Iceland in all countries industry (SME and Non-SME) is the dominating stakeholder. Swedish clusters have the lowest share of industry (56 per cent, SME: 45 per cent) and Finnish clusters, which are dominated by SME, the highest (86 per cent, SME: 80 per cent). The share of industry in Icelandic clusters is only 38 per cent.

The share of R&D institutions and universities is very much different between the countries. Iceland and Germany have the highest share (R&D institutions and universities account for 24 respectively 11 per cent of all stakeholders).

Figure 4: Composition of clusters



1.2.4 REGIONAL CONCENTRATION OF CLUSTERS

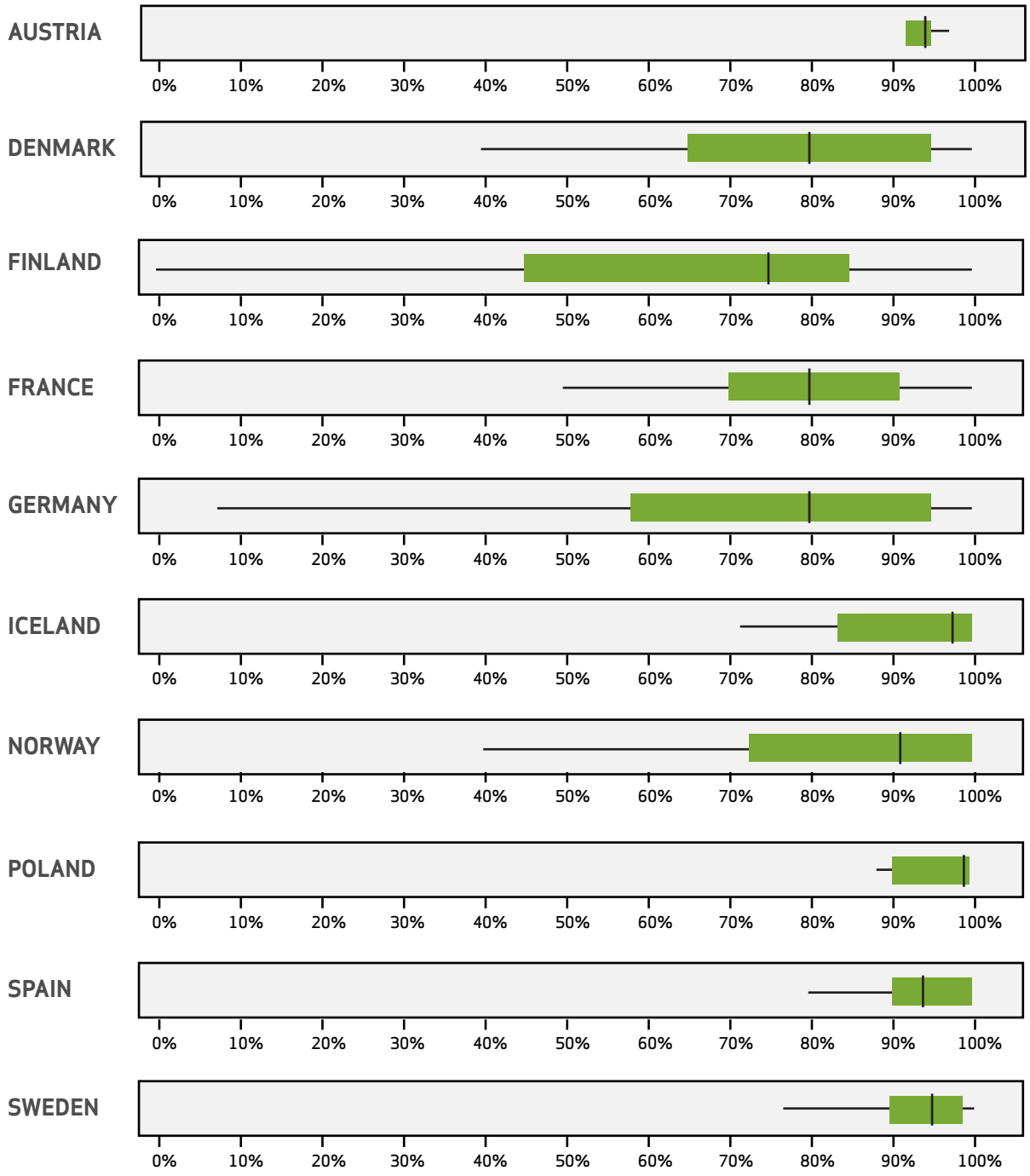
According to the definition of Michael E. Porter "clusters are geographic concentrations of interconnected companies and institutions in a particular field".[3] The closer these players are located to each other, the more likely is not only interaction between them, but also the chance of mutual trust building between them is much higher. Modern ways of communication, particularly structured by the internet, have made communication much easier, but nothing beats face-to-face interaction when it comes to the development and implementation of projects, in particular if problems have to be solved. Personal interaction matters in this regard, as it contributes to the building of trust between project partners, which is a mandatory resource for successful projects.

It was therefore analyzed how dense the regional concentration of a cluster is. Figure 5 displays for each country the percentage of cluster members located within a distance of 150 kilometers from the office of the cluster management organization. This distance can be easily covered by car or train in a short period of time, which facilitates personal interactions through frequent meetings of the cluster stakeholders.

All clusters that were benchmarked show a high regional density with a median value of at least 75 per cent. The conditions for successful work in terms of the spatial proximity of the cluster management organization to the members of the cluster are in these cases favorable.

3 Michael E. Porter, 1998: Clusters and the New Economics of Competition, in: Harvard Business Review, November/December 1998, p. 78

Figure 5: Regional concentration of clusters

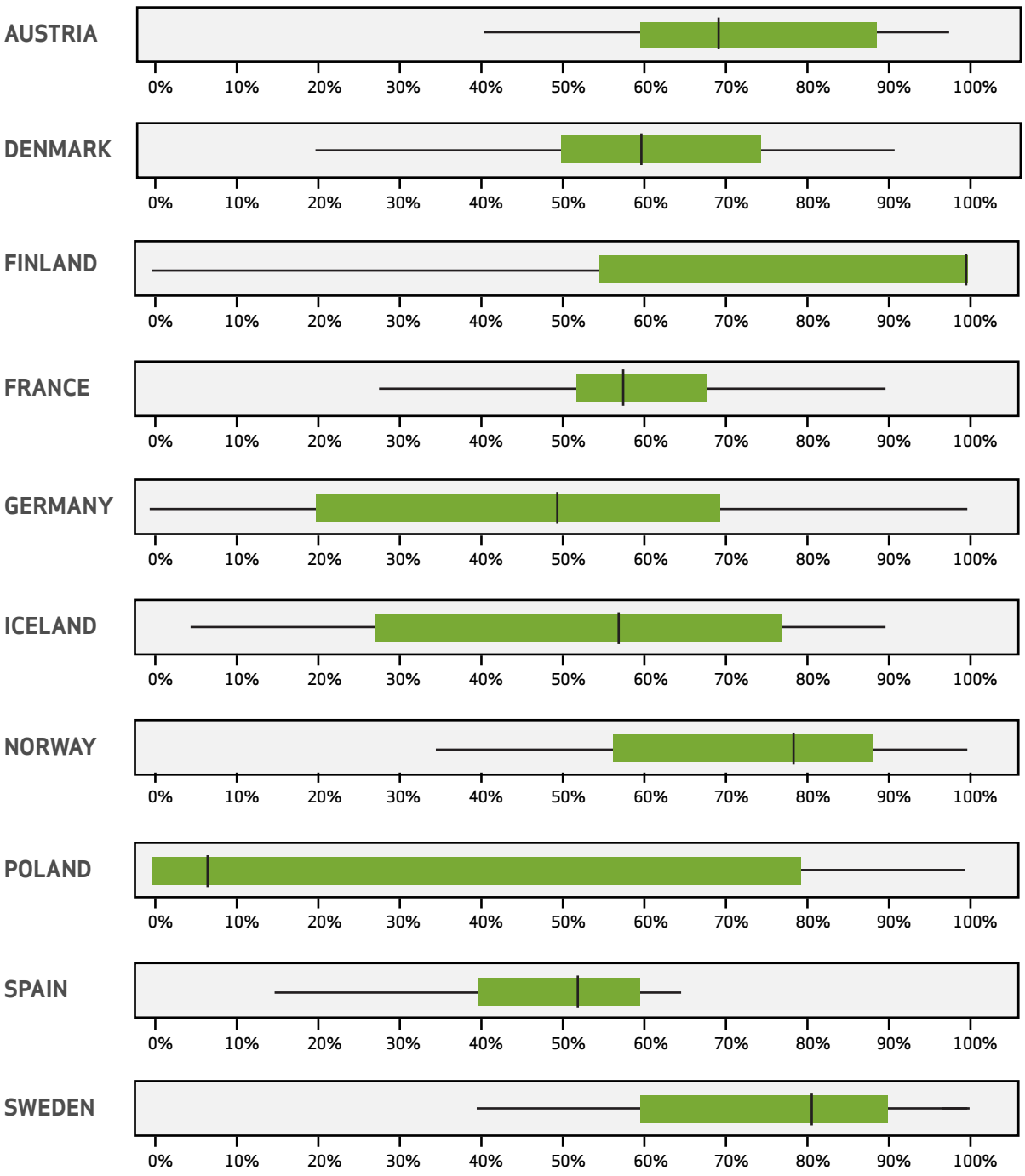


1.2.5 FINANCING OF CLUSTER MANAGEMENT ORGANIZATIONS (SHARE OF PUBLIC FUNDING IN TOTAL BUDGET)

Many cluster management organizations depend to a large extent on public funding to finance staff and other resources, such as office space and equipment (see Figure 6). Sources of public funding include project-based grant funding, institutional funding or service contracts. The sources and the share of public funding depend very much on the clusters and their individual environments as well on the public funding programs that support them. Cluster management organizations can be funded from different regional, national and European funding programs.

The small share of public funding in the budget of Polish cluster management organizations (median value compared to other countries) is due to the fact that many of the clusters originate from groups of companies that have not made use of public funding programs (yet) because they are not eligible (e.g. they do not have a legally institutionalized cluster management organization which is a typical eligibility criterion for funding).

Figure 6: Share of public funds in total budget of cluster management organization



1.3 WHAT MAKES THE DIFFERENCE?

Clusters and their cluster management organisations are individuals. Even though they share some characteristics as discussed in the previous chapter, there are also significant differences. What they are and what actually makes the difference between clusters that are individuals is presented in this chapter.

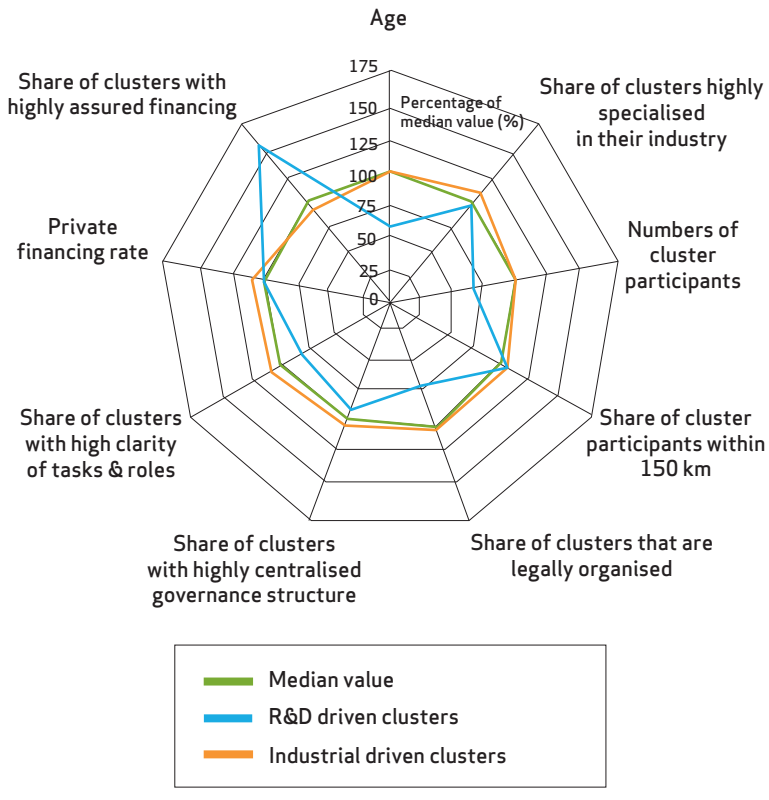
Further insight into this will be provided by further analysis of:

- Differences between research-driven and industry-driven clusters
- Sources of funding
- Relevance of specific determinants
- Effects of the cluster's technology field
- Links between services of the cluster management organisation and SME activities

1.3.1 DIFFERENCES BETWEEN RESEARCH-DRIVEN AND INDUSTRY-DRIVEN CLUSTERS

Research-driven clusters show different characteristics than industry-driven clusters[4]: their financial situation is better than that of industry-driven clusters, they are smaller in terms of numbers of cluster participants and in terms of governance (clarity of roles, level of centralization of governance structure and legal organization) they show a less distinct profile than industry-driven clusters. In contrast to industry-driven clusters the financial outlook in terms of budget security of R&D-driven clusters is better (Figure 7).

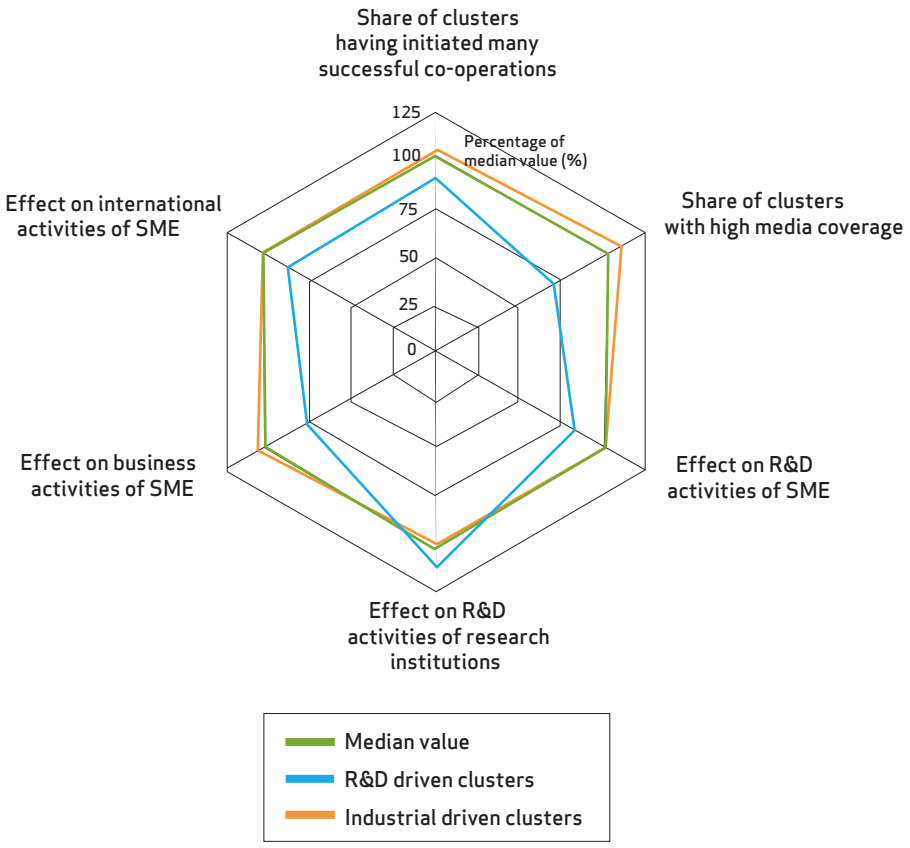
Figure 7: Comparison of R&D- and industry-driven clusters in terms of structural factors



4 In the context of the benchmarking cluster managers were asked to classify their clusters as either research or industry-driven. A cluster is research-driven if strategy and activities are mainly defined by research institutions or universities. If mainly industry defines strategy and activities, then a cluster is classified as industry-driven.

Research-driven clusters have lesser effects on the development of SMEs. While research-driven clusters have a higher effect on R&D activities of research institutions (including universities) than industry-driven clusters through their cluster management organization, their effects on the industry are rather small. In contrast, industry-driven clusters have a larger effect through their cluster management organization on business, R&D and international activities of SME. They are also more successful in establishing co-operations with companies and research institutions outside the cluster. This suggests that the specific impact of a cluster on business, R&D and international activities of the cluster participants depends on the agenda setter: if companies set the agenda – which is the case in industry-driven clusters – they benefit more, if research institutions set the agenda – which is the case in research-driven clusters – they benefit more (Figure 8).

Figure 8: Comparison of R&D- and industry-driven clusters in terms of effects on cluster participants



The following table gives an overview of clusters per country in terms of whether they are research or industry-driven. The vast majority is driven by industry (65% of the total sample). There are only a few research-driven clusters (10% of the total sample), while a quarter of the total sample is both driven by industry and research.

Table 3: Number of research-driven and industry-driven clusters and number of those clusters that are both driven by industry and research

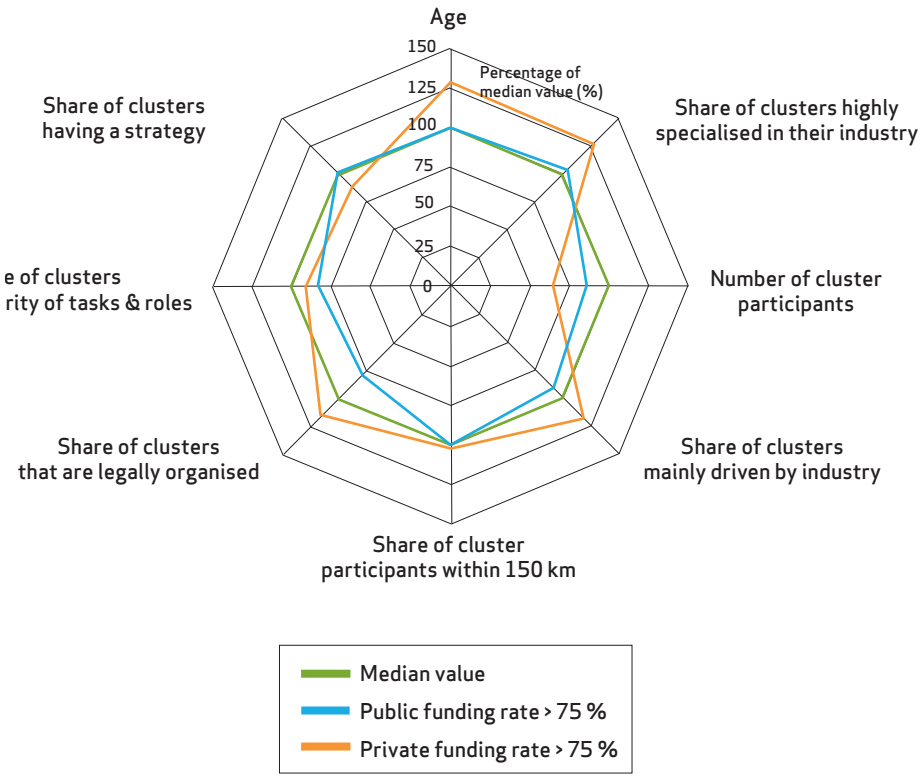
COUNTRY	NUMBER OF RESEARCH-DRIVEN CLUSTERS	NUMBER OF CLUSTERS THAT ARE BOTH DRIVEN BY INDUSTRY AND RESEARCH	NUMBER OF INDUSTRY-DRIV-EN CLUSTERS
AUSTRIA	0	1	5
DENMARK	8	10	12
FINLAND	0	2	9
FRANCE	2	28	43
GERMANY	6	15	53
ICELAND	2	0	2
NORWAY	0	2	14
POLAND	4	3	13
SPAIN	0	1	5
SWEDEN	3	1	7
TOTAL	**25**	**63**	**163**

1.3.2 SOURCES OF FUNDING

In terms of structure and governance clusters with a small share of public funding (private funding has a share of more than 75 per cent in total funding of the cluster management organization) and a high share of public funding (the share of public funding in total funding of the cluster management organization is higher than 75 per cent) are similar. However, there are some differences between these two types of clusters (see Figure 9):

- There are more clusters being mainly driven by industry and highly specialized in a certain industry that have a cluster management organization that is financed to more than 75 per cent by private means.
- Clusters with a cluster management organization that is financed to more than 75 per cent by private means show specific characteristics of governance more often than clusters with cluster management organizations that are financed to a large extent by public funds. They have more often a dedicated legal form (e.g. registered association or limited liability) and there are more cluster management organizations that report a high clarity of tasks and roles. Thus, clusters with a high share of private funding tend to be more often highly institutionalized than clusters with a high share of public funding.
- Cluster management organizations that are funded to a large extent by private means are often older.

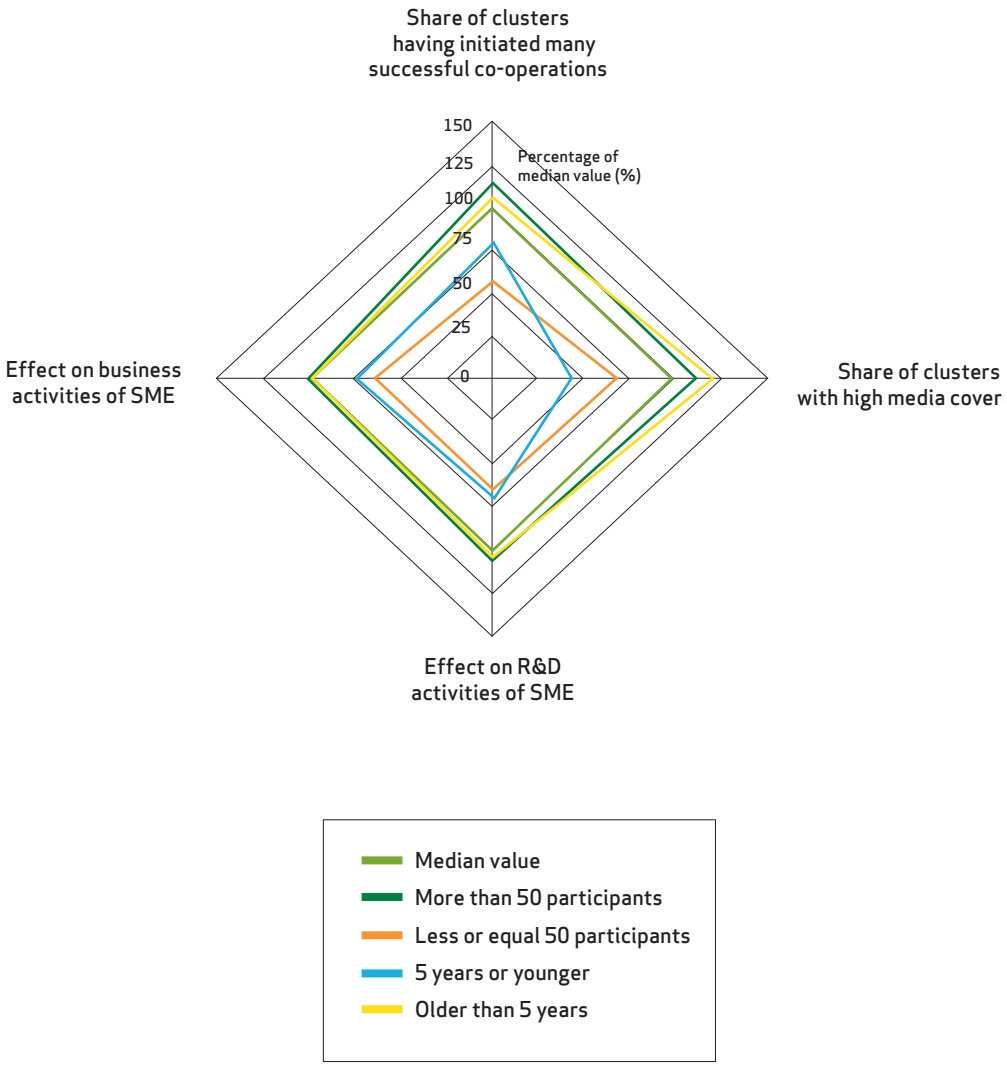
Figure 9: Characteristics of clusters with a small or high share of public funding



1.3.3 RELEVANCE OF SPECIFIC DETERMINANTS

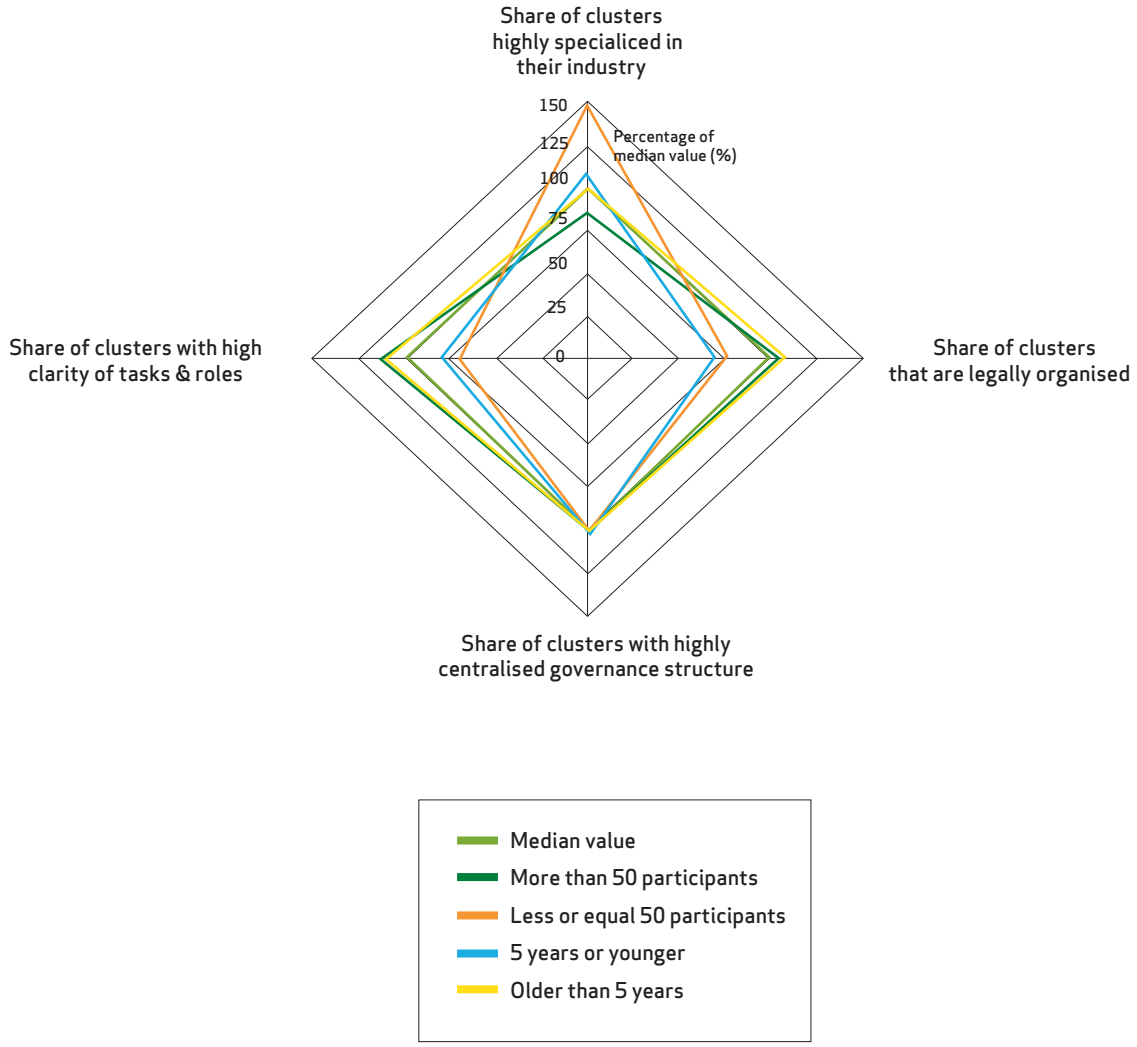
There is a strong correlation between the age and the size of a cluster and the effect of the work of the cluster management organization on business and R&D activities of SME. Clusters that are five years or older and have more than 50 members perform significantly better than younger and smaller clusters in this regard as well as in terms of the numbers of initiated successful co-operations. This is also reflected by the cluster's visibility in terms of press and media coverage (see Figure 10). Apparently, larger and matured clusters provide a much better environment for results and impacts as an effect of activities of a cluster management organization.

Figure 10: Relevance of size and age for the effect on cluster participants



The older and larger a cluster is, the more institutionalized it is in terms of having a legal form (with regard to the cluster management organization) and clarity of tasks and roles (e.g. through statutes or contracts) of its institutional parts such as the cluster management organization, a steering committee or board and a general assembly (see Figure 11).

Figure 11: Relevance of size and age for the level of institutionalisation of the cluster



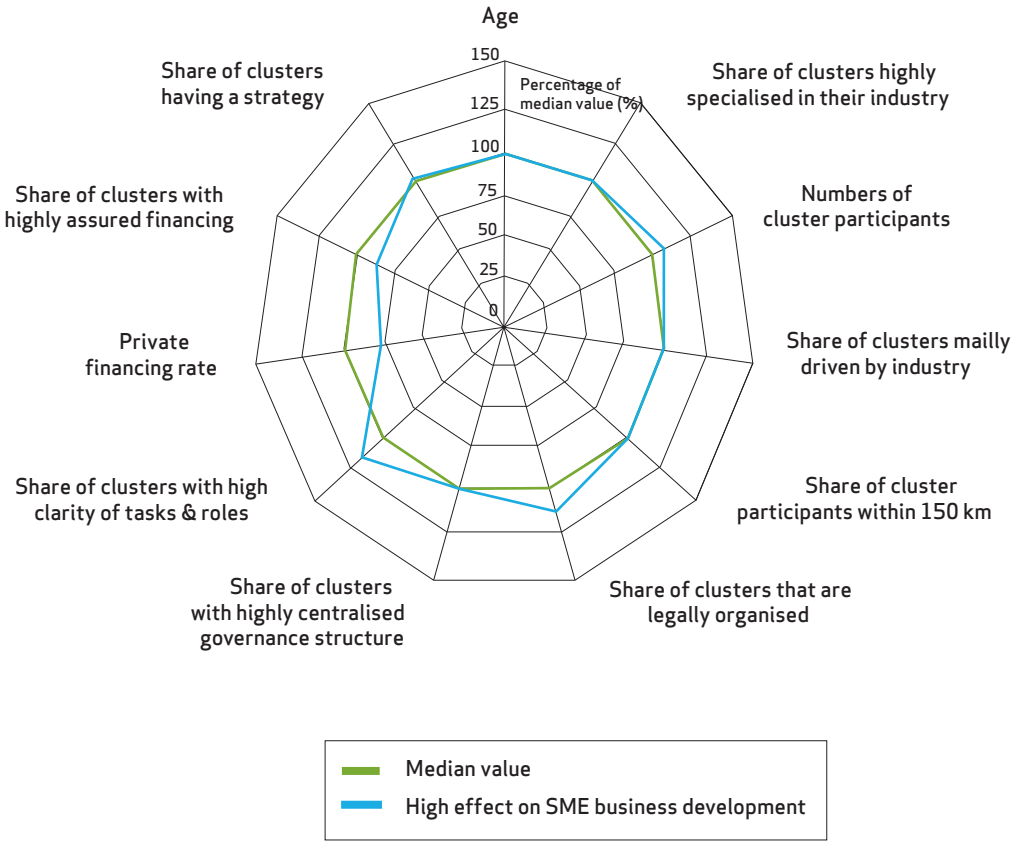
Assuming that clusters that are governed by a cluster management organization mature over time, it is not surprising that they become more and more institutionalized as they learn like any other organization that a certain set of rules is a necessary requirement for success. The process of institutionalization becomes even more relevant the larger and more heterogeneous a cluster is in terms of membership. A clear and binding set of rules and institutions is important for building and maintaining trust in large and heterogeneous groups. The larger and more heterogeneous a group is, the more it tends to be anonymous and thus the more it is prone to misconduct. Institutionalization of rules and processes counterbalances this effect and thus contributes to a culture of trust in a cluster which facilitates collaboration between its members. As business and R&D activities in a cluster require trustfully relationships between the partners, it is not surprising that old and large institutionalized clusters show a higher impact for exampleon business and R&D activities of SME than small and young cluster do.

Another interesting pattern is that smaller clusters tend to specialize in a particular field (see Figure 11). It seems that clusters tend to be less specialized the larger they are. In larger clusters more players are involved with a more diversified set of interests and options for collaboration. This translates into a more diversified development of the technology portfolio of the cluster and – as a result – into a lesser degree of specialization in a particular field.

The finding that size and institutionalization have an important effect on the development of SME is confirmed by a further analysis of structural characteristics of clusters.

Figure 12 shows that clusters that have a high effect on business activities of SME are larger in terms of numbers of members, have more often a legal form (respectively the cluster management organization) and feature more often a clear assignment of tasks and responsibilities of their actors compared to the median value of all analyzed clusters.

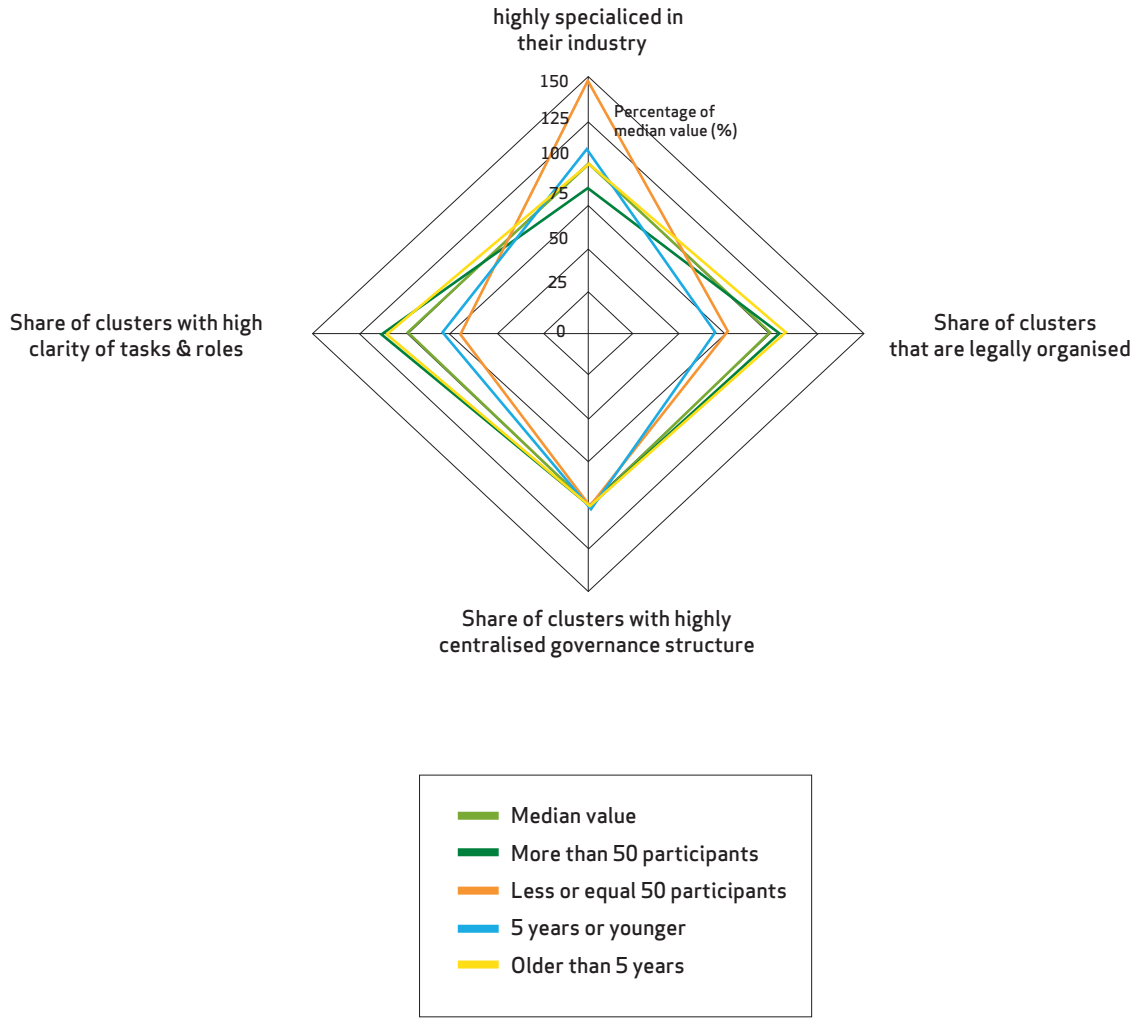
Figure 12: Characteristics of cluster with a high effect on business activities of SME



1.3.4 EFFECT OF THE CLUSTER'S TECHNOLOGY FIELD

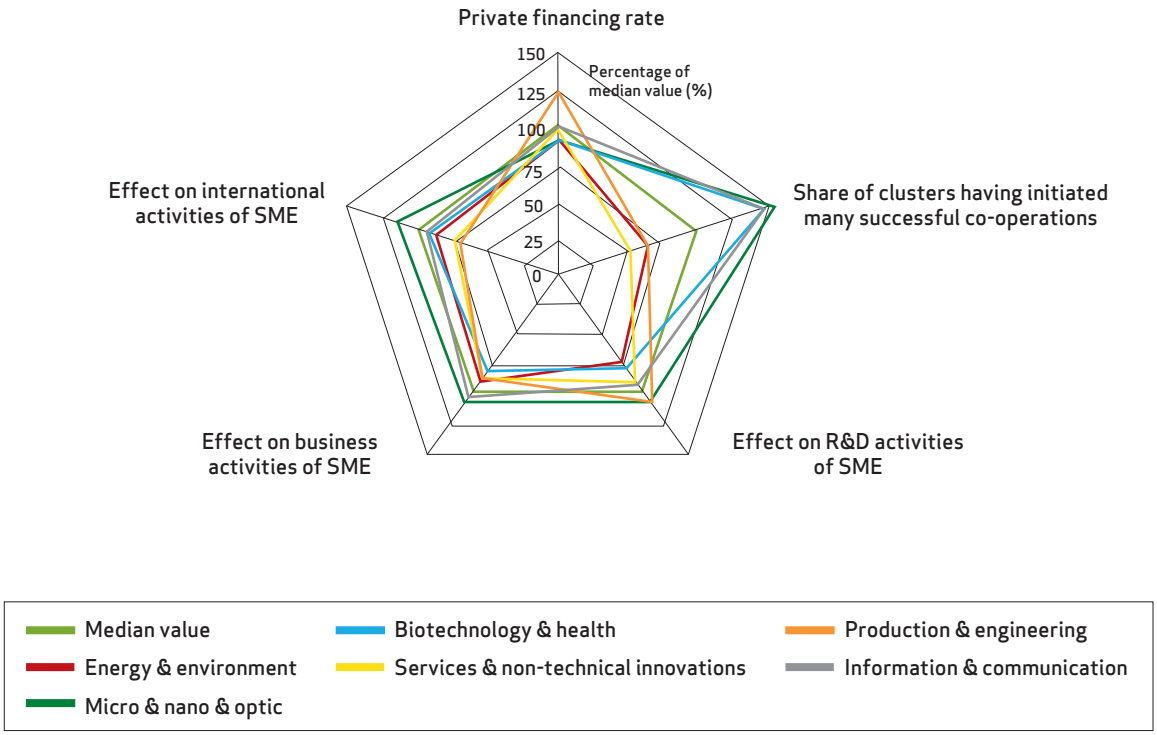
The characteristics of a cluster depend very much on the technology field it is operating in. Figure 13 displays structural characteristics of clusters from six different technology fields. The different structural characteristics reflect the characteristics of their industry sectors or technology fields. For example, biotechnology clusters are less oriented towards industries as still today biotechnology is very much driven by research institutions and universities. Other examples for specific industry characteristics are the industry sectors of energy and environment, services as well as micro, nano and optic. Clusters in these industries are not highly specialized as they work on technologies that can also be applied in various other industries.

Figure 13: Structural characteristics of clusters in different technology areas



There are also differences between clusters in different technology areas when it comes to the impact of the work of the cluster management organization and the share of private funding of the cluster management organization (see Figure 14).

Figure 14: Effects and private funding of clusters in different technology areas

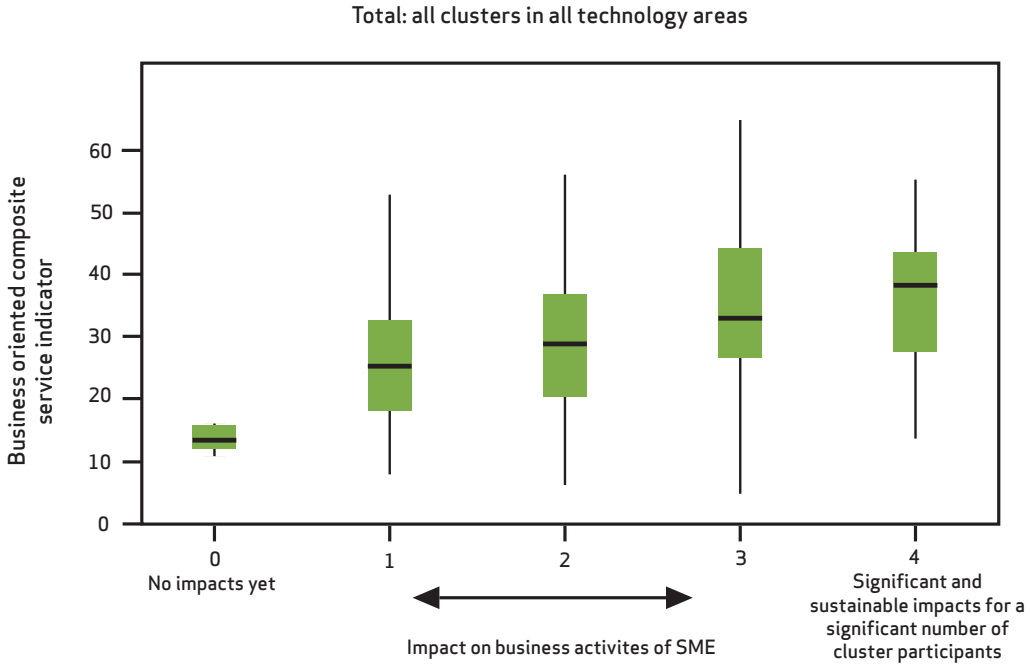


These findings demonstrate that the industry or technology field in which a cluster operates in has an important effect both on the structural characteristics of a cluster and the performance of a cluster management organization. This is an important conclusion for the development of future cluster programs. In order to support clusters according to their specific needs cluster programs have to take the specific technology foci of clusters into account.

1.3.5 LINK BETWEEN SERVICES AND SME DEVELOPMENT

A cluster management organization can influence the development of a cluster through the provision of targeted services for its members (see Box 2 for an overview of services). The analysis of the benchmarking results has demonstrated that the more active a cluster management is in this regard, the higher its impact on the development of business activities of cluster members is. This was in detail analyzed for SME members by calculating a composite indicator for business-oriented services provided by the cluster management organization that was put in relation with the impact of the work of the cluster management organization on business activities of SME. Figure 15 displays a correlation between the spectrum and intensity (in terms of frequency) of business-oriented services and the impact of the work of the cluster management organization on business activities of SME. The more services are provided (see e.g. the median value), the higher the impact on business activities of SME is.

Figure 15: Effect of Spectrum and Intensity of Services on Business Activities of SME



1.4 EXCELLENT CLUSTER MANAGEMENT ORGANIZATIONS - WHAT ARE THEIR DISTINCTIVE CHARACTERISTICS?

Excellent management is considered to be a general prerequisite for successful operation in industry and the private sector in general, in the public sector, like education, health, environment, etc., and in public administration and governmental organizations Therefore, it is obvious that excellent management should also be considered as a main prerequisite for a cluster organization to achieve the highest impacts of the cluster within a given technological, industrial, regional, and legislative framework: for the cluster participants, for the industrial sector in general, and for the development of regions.

Out of the 261 cluster organizations that have been benchmarked since November only 71 – less than a third – can be considered as excellent cluster management organizations (see Table 4). These organizations demonstrate sophisticated management approaches according to the "excellence indicators" defined by the European Cluster Excellence Initiative (ECEI) (see Table 5 on next page) as well as a high level of services and activities.

In terms of structural characteristics excellent clusters respectively their management organisations have more participants and feature more often a higher clarity of tasks and roles in terms of governance. The age of a cluster management organisation as well as the regional concentration of the cluster participants within the cluster do not have an effect on the level of excellence.

Table 4: Number of clusters of the excellence portfolio per specific technology area

TECHNOLOGY AREAS	Aviation and space	Biotechnology	Construction/building sector	Energy and environment	Food industry (non-biotech)	Health and medical science	Humanities/social sciences, media, design, service innovation	Information and communication	Micro, nano and optical technologies	New Materials and chemistry	Production and engineering	Transportation and mobility	TOTAL
TOTAL	5	2	2	11	5	5	6	13	4	7	7	4	71
PERCENT OF EXCELLENT CLUSTERS IN THE SPECIFIC TECHNOLOGY AREA	63 %	13 %	40 %	27 %	21 %	26 %	32 %	33 %	18 %	29 %	26 %	25 %	27 %

Table 5: Excellence indictors of the European Cluster Excellence Initiative (ECEI)

DIMENSION	INDICATOR
STRUCTURE OF THE CLUSTER	Committed Cluster Participation
	Composition of the Cluster Participants
	Number of Committed Cluster Participants in Total
	Geographical Concentration of the Cluster Participants
TYPOLOGY, GOVERNANCE, COOPERATION	Maturity of the Cluster Management
	Human Resources Available for the Cluster Management
	Qualification of the Cluster Management Team
	Life Long Learning Aspects for the Cluster Management Team
	Stability and Continuity of Human Resources of the Cluster Management Team
	Stability of Cluster Participation
	Clarity of Roles – Involvement of Stakeholders in Decision Making Processes
	Direct Personal Contacts Between the Cluster Management Team and the Cluster Participants
	Degree of Cooperation within the Cluster
	Integration of the Cluster Organisation in the Innovation System
FINANCING	Prospects of the Financial Resources of the Cluster Organisation
	Share of financial resources from private sources
STRATEGY, OBJECTIVES, SERVICES	Strategy Building Process
	Documentation of the Cluster Strategy
	Implementation Plan
	Financial Controlling System
	Review of the Cluster Strategy and Implementation Plan
	Performance Monitoring of Cluster Management
	Focus of the Cluster Strategy
	Activities and Services of the Cluster Management
	Performance of the Cluster Management
	Working Groups
	Communication of the Cluster Organisation
	Cluster organisation's web presence
ACHIEVEMENTS, RECOGNITION	Recognition of the Cluster in Publications, Press, Media
	Success Stories
	Customer and Cluster Participants' Satisfaction Assessment

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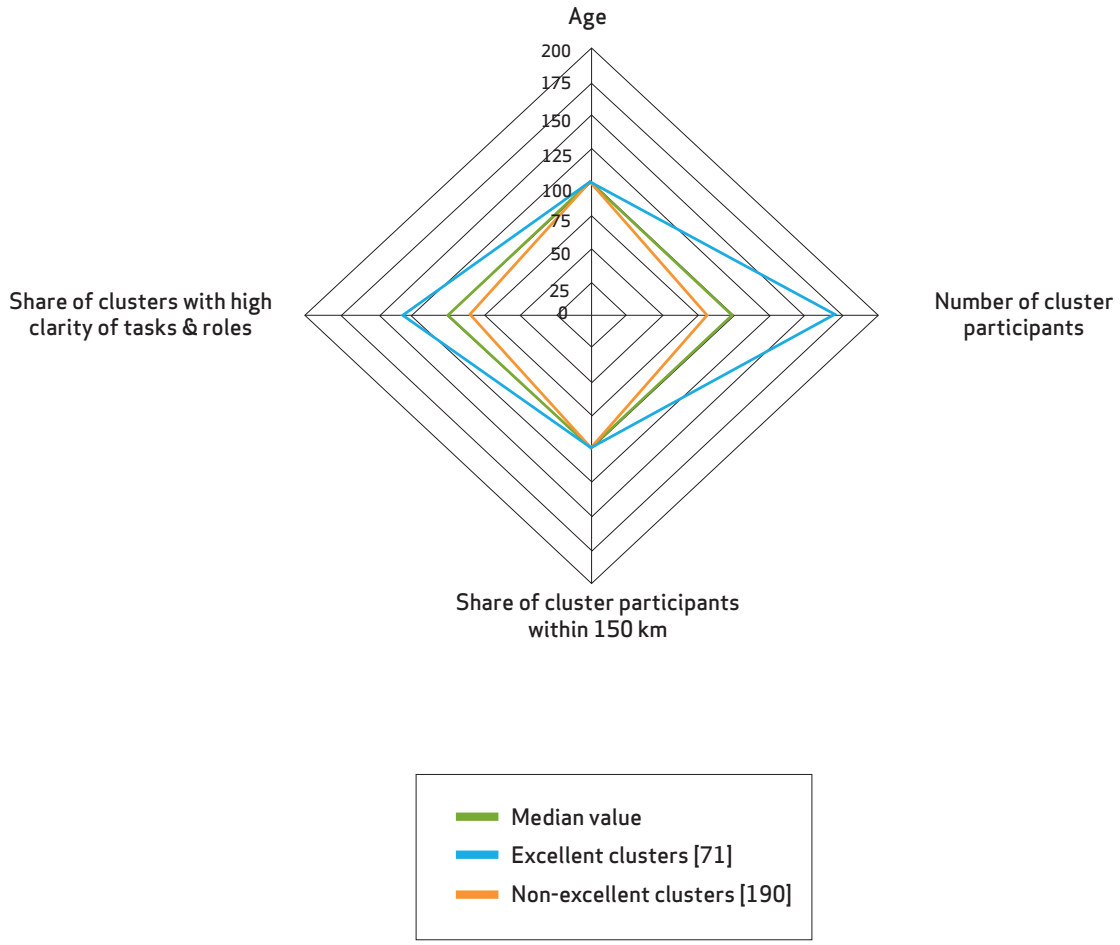
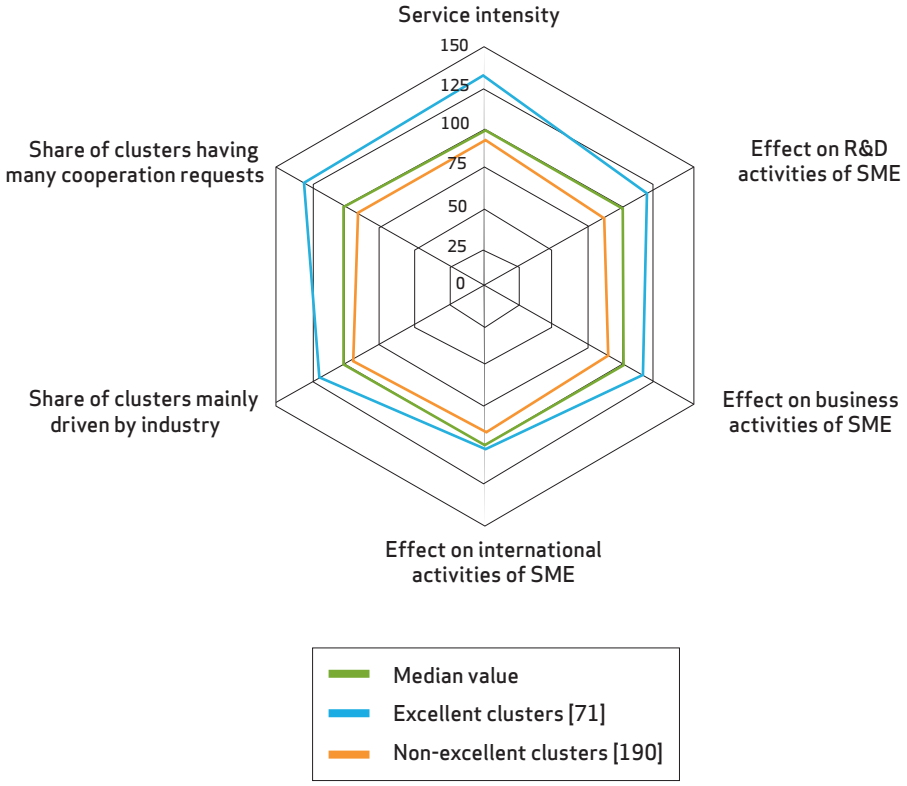
	Success Stories
	Customer and Cluster Participants' Satisfaction Assessment

Figure 16: Comparison of structural characteristics of excellent and non-excellent clusters



There is a clear difference between excellent and non-excellent clusters and their management organizations in terms of activity levels and effects. Excellent cluster management organizations demonstrate higher service intensity than non-excellent cluster management organizations and their agenda is more often driven by industrial interests. In view of the results and effects the high service intensity of excellent management organizations reflects in higher effects on R&D activities of SME, business activities of SME, international activities of SME and a larger number of cooperation requests from parties outside the cluster (Figure 17 on next page).

Figure 17: Comparison of effects created by excellent and non-excellent clusters



Summing up the observations, it can be concluded that size, an adequate level of governance and the provision of services are key characteristics of excellent cluster management organizations that yield effects on cluster development, particularly in regard to the development of business, R&D and international activities of SMEs. Hence, excellence cluster organisations provide higher impact on business.

1.5 WHAT MAKES THE DIFFERENCE? SOME KEY FINDINGS

Clusters and their cluster management organisations are individuals. Although each individual is different, analysis reveals some characteristics that are typical for specific "groups of individuals". This applies in particular to the level a cluster is driven by research or industrial interests, the level of private funding of a cluster management organisation, size and age of the cluster respectively its cluster management organisation, the technology field of the cluster and services that are provided by the cluster management organisation to facilitate the development of the cluster:

1) Research- and industry-driven clusters are different in terms of financial situation, size and governance – and most important: industry-driven clusters have a higher effect on SME development.
2) The majority of clusters are mainly driven by industry and - not surprisingly - they also have a higher share of private financing than the research driven clusters.
3) There is a strong correlation between the age and the size of a cluster and the effect of the work of the cluster management organization on business and R&D activities of SME. Clusters that are five years or older and have more than 50 members perform significantly better than younger and smaller clusters in this regard.
4) The characteristics of a cluster depend very much on the technology field it is operating in. This includes

structural characteristics such as governance, being driven by research- or industry, size and age, but also the effect of the cluster management organisation on business, R&D and international activities of SME.

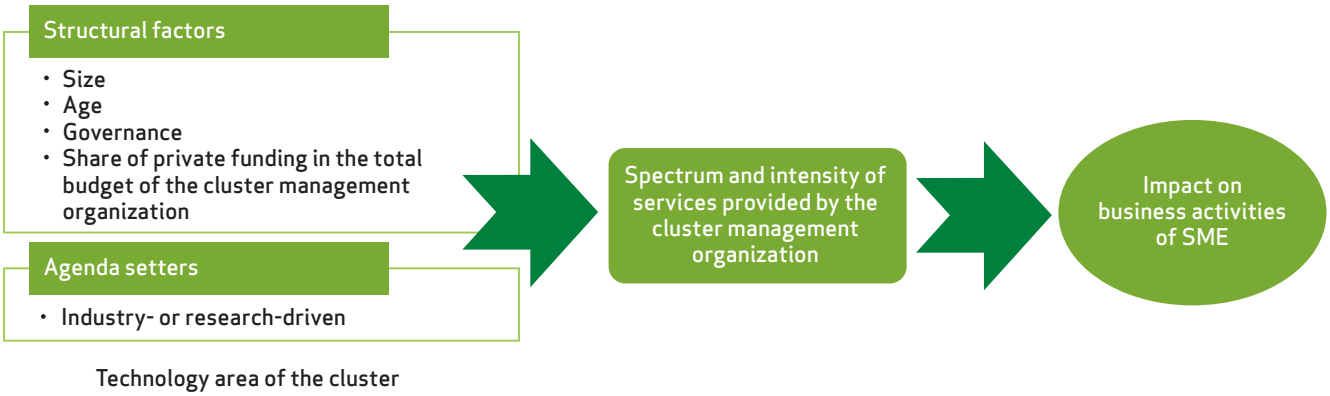
5) There is a correlation between the spectrum and intensity (in terms of frequency) of business-oriented services provided by a cluster management organisation and its effects on business activities of SME. The more services are provided, the higher the impact on business activities of SME is.
6) The older and larger a cluster is, the more institutionalized it is in terms of having a legal form (with regard to the cluster management organization) and clarity of tasks and roles
7) Excellent cluster management organizations reveal higher service intensity than non-excellent cluster management organizations and their agenda is more often driven by industrial interests. In addition, excellent cluster initiatives tend to have more participants and higher clarity of tasks and roles in terms of governance. Hence, excellence cluster organisations provide higher impact on business.

1.6 KEY DETERMINANTS FOR THE IMPACT OF A CLUSTER ON BUSINESS ACTIVITIES OF CLUSTER MEMBERS

The results of the benchmarking suggest that several key determinants matter in terms of a cluster's impact on the business activities of its members; this applies in particular to the impact on business activities of SME. Structural factors such as size, age, governance and the type of agenda setter (industry or research stakeholders) have an effect on the spectrum and intensity of services provided by the cluster management organization and thus on the development of business activities of SME.

Figure 18 displays the causal relationship of structural factors and agenda setters, services and effects: The impact of a cluster in terms of SME business activities depends on the spectrum and intensity of services provided by the cluster management organization which in turn depends on specific characteristics of the structural factors and agenda setters as displayed in the figure, which might be influenced by the specific characteristics of the technology area the cluster is operating in.

Figure 18: Key determinants for impact on business activities of cluster members



Although these determinants are general findings whose relevance may depend on the individual context of a cluster, particularly on the technology field the cluster is operating in, they provide guidance for the development of cluster programs. From a general perspective the conclusion of the cluster management organization benchmarking in this regard is: the more matured in terms of age and institutionalization, the larger in terms of size of membership, the more industry-driven a cluster is and the more active its cluster management organization is in terms of spectrum and intensity of service offer, the higher its effect on economic development is. This is a key message for policy makers and program owners.

Box 2: Overview services of cluster management organizations

Services for clusters members that are provided by the cluster management organization are an important instrument to develop a cluster. They provide a basis for intensifying and/or stabilizing interaction between cluster members, reduce the time and costs spent by cluster members through high-quality standard solutions and/or allow cluster members to focus on their core activities.[5] Table 6 gives a general overview of services that can be offered by a cluster management organization to support the development of a cluster:

CATEGORIES OF SERVICES	EXAMPLES OF SERVICES
ACQUISITION OF THIRD-PARTY FUNDING FOR PROJECTS (PUBLIC FUNDS)	• Acquisition of R&D and non-R&D projects on behalf of cluster members • Distribution of information about funding programs
COLLABORATIVE TECHNOLOGY DEVELOPMENT, TECHNOLOGY TRANSFER AND R&D PROJECTS	• Organization of tasks forces/working groups • Management of projects on behalf of cluster members • Legal advice, e.g. on IPR
INTERNAL NETWORKING AMONG CLUSTER MEMBERS	• Regular meetings, get-togethers, thematic events/workshops for cluster members • Internal newsletters, databases etc.
DEVELOPMENT OF HUMAN RESOURCES	• Participation in the development and implementation of vocational training or study courses together with external partners such as universities • Training courses for cluster members • Recruitment of staff on behalf of cluster members
DEVELOPMENT OF ENTREPRENEURSHIP	• Consulting and coaching • Acquisition of financing (e.g. venture capital, banks, public funds) on behalf of entrepreneurs
MATCHMAKING AND NETWORKING WITH EXTERNAL PARTNERS/PROMOTION OF THE CLUSTER LOCATION	• Information material, website, press releases, publications • Presentation of the cluster and its members on trade fairs or conferences • Events/workshops to present the cluster • Matchmaking/partnering events
INTERNATIONALIZATION OF THE CLUSTER	• Presentation of the cluster and its members on trade fairs or conferences, networking visits, study tours • Offices or other permanent representations abroad • Cooperation with export promotion agencies

For further information about this topic please see Buhl, Claudia Martina/Meier zu Köcker, Gerd (eds.), 2009: Cluster Management Excellence, Vol. 1: Network Services, Competence Networks Germany, Berlin, www.kompetenznetze.de/the-service/order-service/cluster-management-excellence-volume-1-network-services

5 Sydow, Jörg/Zeichhardt, Rainer, 2009: Importance of Network Services for the Success of Networks, in: Buhl, Claudia Martina/Meier zu Köcker, Gerd (eds.), 2009: Cluster Management Excellence, Vol. 1: Network Services, Competence Networks Germany, Berlin, p. 20

2 RESULTS OF THE BENCHMARKING OF CLUSTER PROGRAMS

Cluster policy issues have appeared in scientific publications since the 1990s.[6] Until today, the question has remained, whether there are long term impacts visible in those countries where cluster programs have been implemented. This chapter gives an overview of 34 European cluster programs, their objectives, activities, instruments and results.
Clusters help people engaged in the same technology field to network with each other, e.g. companies with companies, companies with research institutes, universities with governments and so forth. Policies are set up to reply to market failures. By implementing a cluster policy, national or regional economies are able to reply to the market failure of information asymmetries. As a consequence countries have started to set up specific policies particularly designed to help establishing new clusters and advancing matured ones.

Thus, governments are eager to start specific policies aiming at the development of clusters –cluster programs – in order to increase the benefit for the companies, universities and R&D institutions and other service providers within the cluster. Quoting Boekholt and Thuriaux, cluster policies "comprise the set of policy activities that aim to: stimulate and support the emergence of these networks; strengthen the interlinkages between the different parts of the networks; and increase the value added of their actions".[7] Ketels defines cluster policy as "efforts by governments, alone or in a collaborative effort with companies, universities, and others, that aim to increase the competitiveness of specific clusters by organizing government policies around them."[8] Both definitions serve as basis for the analysis presented in this chapter.

Sure, it is one of the government's main task to inspire overall national or regional strategies that lead to more business deals and motivate more R&D activities, thus improving the framework conditions for economic well-being. Fulfilling these authoritative tasks, many policy makers have realized that f. ex. installing infrastructures for the development of clusters and further supporting them can be a good step towards smart specialization. The concept of smart specialization includes an "entrepreneurial process of discovery"[9] about what the unique selling propositions with regard to R&D and production of a specific country or region are. In a way, this is a bottom-up policy process which may probably be best carried out by clusters and networks. It can therefore be assumed that due to the corrective influence of clusters within an economy, many countries have set up their specific cluster program.

It is hence of interest to compare the characteristics of the current cluster programs in Europe in order to learn a. o. which cluster program has well-developed instruments, which one is well adjusted to its country specific economic development strategy and which cluster programs provide ideas for others to follow a distinct R&D strategy.

For this reason, a pan-European benchmarking exercise was initiated of which the first run took place in 2011 and the second in 2012. The results of the 2011 benchmarking of cluster programs have been updated in 2012 and are presented in this chapter. Furthermore, the data base of 2012 has been extended by more cluster programs. They have been benchmarked with the same criteria as the programs analyzed in 2011. As of today, 34 cluster programs of 24 countries are included in the cluster program benchmarking portfolio.

A group of experts of 24 European countries has evaluated their specific national or regional cluster program.

As already stated in the introduction, nowadays policy makers and program owners are no longer facing the question whether they should establish new clusters, but the question of how they can improve the global competitiveness of existing clusters. How can cluster programs support the development of clusters that can compete in a global economy? How can cluster programs contribute to cluster management excellence as a precondition of world-class clusters? These questions motivated policy makers and program owners from different European countries to engage in a benchmarking of cluster programs that should facilitate mutual learning in this respect.

Chapter 3.1 introduces the comparative portfolio, which consists of 34 cluster programs from 24 countries. Chapter 3.2 describes the characteristics of these programs in terms of objectives, strategic focus, instruments, terms and financial aspects. Important key findings from the benchmarking are presented in chapter 3.3. The key findings give further insight into the different types of cluster programs,

6 Cf.: OECD (1999). Boosting Innovation: The cluster approach. Paris: OECD Proceedings.; Sölvell, Ö., Lindqvist, G., Ketels, Ch., (2003). The Cluster Initiative Greenbook. www.cluster-research.org.

7 Boekholt, P., Thuriaux, B. (1999). Public policies to facilitate clusters: background, rationale and policy practices in international perspective. In: Boosting Innovation: the cluster approach. Paris: OECD Proceedings. p. 381.

8 Ketels, Ch. (2010). Cluster Policy: A Guide to the State of Debate. In: Hernández, J.M., Pezzi, A., Soy, A. (2010). Clusters and competitiveness: the case of Catalonia (1993-2010). Government of Catalonia, Ministry of Enterprise and Labour, Directorate General for Industry, Observatory for Industrial Foresight

9 Foray, D., David, P., Hall, B. (2009). Smart Specialization – The Concept. In: Knowledge Economists Policy Brief No. 9. European Commission.

their relevance on the policy agenda and their coordination with other funding programs, support of cluster internationalization, the role of program owners when it comes to the development of clusters, the relevance of cluster management excellence in the programs, monitoring and evaluation practices and lessons learned by the program owners.

With this update of the cluster program benchmarking, six countries that have joined the EU only in 2004 have been added to the portfolio (Hungary, Czech Republic, Romania, Lithuania, Estonia and Latvia). Thus, in total the benchmarking exercise includes seven (+ Poland) "younger" EU member states. It is thus of special interest, if these countries have different core areas in their programs.

2.1 COMPARATIVE PORTFOLIO

The cluster program benchmarking covered 34 cluster programs from 24 countries, which are Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Italy, Latvia, Lithuania, Luxembourg, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Spain, Sweden, Turkey and United Kingdom.

Figure 19: Participating countries

The programs cover a wide array of different rationales, objectives and instruments, but have the development of clusters through the support of cluster management organizations in common.

Table 7: Overview of cluster programs

COUNTRY	NAME OF PROGRAM	INTERNET
AUSTRIA	Cluster Program Lower Austria	www.ecoplus.at/en/ecoplus/cluster
BELGIUM	Competence Centres-Light Structures	Public website not yet available
	Cooperative innovation network integrated project	http://www.iwt.be/subsidies/vis-trajecten
CZECH REPUBLIC	Cooperation–Clusters	www.czechinvest.org
DENMARK	Innovation Networks Denmark (Innovationsnetværk Denmark)	www.innovationsnetvaerk.dk
ESTONIA	Cluster Development Program	www.eas.ee
FINLAND	Centre of Expertise Program (OSKE, Osaamiskeskusohjelma)	www.oske.net
	Strategic Centres for Science, Technology and Innovation (SHOK, Strategisen huippuosaamisen keskittymät)	www.tekes.fi
FRANCE	Grappe d'entreprises	www.territoires.gouv.fr/grappes-denterprises
	Les Pôles de Compétitivité	www.competitivite.gouv.fr
GERMANY	Competence Networks Germany (Initiative Kompetenznetze Deutschland) (expired)	www.kompetenznetze.de
	Go-Cluster Initiative	www.go-cluster.de
	Clusterpolitische Gesamtstrategie der Freien und Hansestadt Hamburg (Cluster Policy Strategy of the Free and Hanseatic City of Hamburg)	www.bwa.hamburg.de
	Cluster Offensive Bayern (Bavarian Cluster Initiative)	www.cluster-bayern.de
	Zentrales Innovationsprogramm Mittelstand – Fördermodul Netzwerkprojekte (ZIM NEMO) (Central Innovation Program SME – Funding Module Network Projects)	www.zim-bmwi.de/netzwerkprojekte
HUNGARY	Cluster Development Program of the New Széchenyi Plan	www.magzrt.hu

ICELAND	Strategic Research Program for Centres of Excellence and Research Clusters (The Icelandic Centre for Research (Rannsóknamiðstöð Ðslands))	www.rannis.is
	Regional Growth Agreements (Vaxtarsamningur)	www.vaxtarsamningur.is
ITALY	Innovation Clusters Piedmont	www.regione.piemonte.it
LATVIA	Cluster Program	www.liaa.lv/lv/es_fondi/projektu_istenosana/klasteru_programma/
LITHUANIA	InnoCluster LT	www.ukmin.lt
	InnoCluster LT+	www.ukmin.lt
LUXEMBOURG	Luxembourg Cluster Initiative	www.clusters.lu
NORWAY	Norwegian Centres of Expertise (NCE)	www.nce.no
	Arena Program (Arena-programt)	www.arena-programt.no
POLAND	Polish Cluster Support Schemes: Support for the development of Supra-Regional Clusters and Cluster Creation in Eastern Poland	www.parp.gov.pl
PORTUGAL	Portuguese Operational Competitiveness Program - COMPETE	www.pofc.qren.pt
ROMANIA	Development of business support infrastructures of national and international interest (Competitiveness Poles)	http://amposcce.minind.ro
	Support to the integration of SMEs in value chains and clusters (Clusters)	http://amposcce.minind.ro
SERBIA	Serbian Cluster Development Support Program	http://klasteri.merr.gov.rs/en/
SLOVAKIA	Support to innovative industrial cluster organizations	Not yet available
SPAIN	Cluster Development Catalonia	www.acc10.cat/en//index.jsp
SWEDEN	Vinnväxt	www.vinnova.se/en/activities/vinnvaxt
TURKEY	Support for the Improvement of International Competitiveness (UR-GE)	www.smenetworking.gov.tr/
UNITED KINGDOM	Knowledge Transfer Networks	https://connect.innovateuk.org

For a detailed overview of each program in terms of rationales, objectives, instruments and results please see the appendix to this report: "Description of Cluster Programs".

2.2 CHARACTERISTICS OF CLUSTER PROGRAMS

This chapter provides a tabular overview of the different programs in terms of

- Overall objectives of the cluster programs
- Strategic Focus: Creation of new clusters or support of existing clusters?
- Strategic objectives of cluster programs in terms of numbers of clusters to be supported etc.
- Strategic approach: top-down or bottom-up
- Instruments of cluster programs
- Term of cluster programs and financial aspects

2.2.1 OVERALL OBJECTIVES OF THE CLUSTER PROGRAMS

The cluster programs that have participated in the benchmarking feature a diverse set of overall objectives. Common to all programs is their rationale of increasing the competitiveness of the national economy through the facilitation of collaboration between companies and research stakeholders. Most of the programs have a national perspective, while a few focus on the promotion of regional systems of innovation. The diverse set of overall objectives also reflects different types of cluster programs, each of them serving a specific purpose.

Table 8: Overall objectives of the cluster programs

COUNTRY	NAME OF THE PROGRAM	OVERALL OBJECTIVES
AUSTRIA	Cluster Program Lower Austria	• To foster innovation through cooperation of companies in the region's fields of economic strength
BELGIUM	Competence Centres-Light Structures	• To support innovation for a large group of companies with focus on SMEs. These projects should bring companies and knowledge providers together and contribute to the solution of major socioeconomic challenges
	Cooperative innovation network integrated project	• To support innovation for a group of at least 20 companies with focus on SMEs. These projects should result in innovative solutions that can have a short term implementation
CZECH REPUBLIC	Cooperation–Clusters	• To support the development of cooperative sectoral alliances (clusters) on regional and national level as a tool for the stimulation of international competiveness and acceleration of economic growth • To create a favorable business climate with improved conditions for business development and innovations and to build a sustainable competitive advantage by enhancing the quality of relationships among research institutions, universities and business sectors
DENMARK	Innovation Networks Denmark	• To strengthen innovation and research in Danish companies and thereby promote knowledge-based growth in business and industry • To strengthen public-private interaction and knowledge sharing and development of research and innovation between knowledge institutions and companies
ESTONIA	Cluster Development Program	• To increase the international competitiveness of entrepreneurs through implementing the co-operation projects of a cluster

FINLAND	OSKE – Centres of Expertise Program	• To create new innovations, products, services, companies and jobs based on top-class expertise • To support interregional specialization and division of duties in order to create internationally competitive centres of expertise • To increase the attraction of regional innovation environments in order to lure international companies, investments and leading experts to the region
	SHOK – Strategic Centres for Science, Technology and Innovation	• To establish international Strategic Centres of Excellence in STI in key competence areas with regard to future needs of the business sector and society. The centres are expected to renew industry clusters and to create radical innovations
FRANCE	Grappe d'entreprises	• To develop business clusters in economic sectors with weak R&D activity
	Les Pôles de Compétitivité	• To boost the competitiveness of the French economy and to help develop growth and jobs in key markets • To improve the attractiveness of France by providing support for high-tech and creative activities, primarily industrial, in the various regions of France and by that increasing international visibility
GERMANY	Competence Networks Germany	• To facilitate intensive networking between industry and science to increase the innovation capacity and international competitiveness of German industry • To increase international visibility of the clusters and by this market Germany as an international innovation hub
	Go-Cluster	• To continue the mission of the Competence Networks Initiative • To increase the competitiveness of German regions • To approach the excellence status of European cluster management organizations
	Cluster Offensive Bayern	• To support the competitiveness of the Bavarian enterprises in selected fields of competence
	Cluster Policy Strategy of Hamburg	• Medium and long term support of economic growth and employment
	Zentrales Innovationsprogramm Mittelstand – Netzwerkprojekte (ZIM NEMO)	• Development of innovation capacities and competitiveness of SME through the support of innovation networks
HUNGARY	Cluster Development Program of the New Széchenyi Plan	• To develop R&D and innovation infrastructure, improve the facilities of higher education institutes • To motivate the cooperation of companies through clusters • To support joint innovation investments of clusters • To accredit innovative clusters
ICELAND	Regional Growth Agreements (Vaxtarsamningur)	• To promote innovation and strengthen the competitiveness of regions through networking and cluster co-operation among firms, R&D institutions, universities, municipalities and the government
	Strategic Research Program for Centres of Excellence and Research Clusters	• To reinforce science and technology research, encourage successful collaboration between different parties nationally, as well as internationally and actuate value creation and investment in research and innovation in the economy
ITALY	Innovation Clusters Piedmont	• To identify firms' technological needs in order to guide future regional policy actions in support of research and innovation • To stimulate R&D and innovation in its firms, valorizing the present assets, developing the internationalization processes and increasing the attraction of productive investments in the region

LATVIA	Cluster Program	• To promote cooperation between unrelated companies operating in specified sectors and research, educational and other institutions, thus promoting increase of export volumes and competitiveness of entrepreneurs as well as development of new products
LITHUANIA	InnoCluster LT	• To stimulate the collaboration of Lithuanian industries • To increase international competitiveness of Lithuanian industries
	InnoCluster LT+	• To stimulate collaboration among Lithuanian industries and to increase international competitiveness of Lithuanian industries • To create a favorable environment for innovative clusters and to develop international clusters
LUXEMBOURG	Luxembourg Cluster Initiative	• To enhance the visibility of the technological excellence and the innovation potential of cluster members • To encourage the uptake of new technologies and the identification of potential business opportunities
NORWAY	Norwegian Centres of Expertise (NCE)	• To facilitate growth by generating and reinforcing cooperation-based innovation and internationalization processes within clusters with clear ambitions and substantial national and international growth potential
	Arena Program	• To strengthen the capability of regional business environments for innovation and value creation by intensifying alliances between business environments, educational institutions and the public sector
POLAND	Polish Cluster Support	• Increased competitiveness of the Polish economy through the support of the establishment and development of clusters at the national and regional level
PORTUGAL	COMPETE	• To improve the sustained competitiveness of the Portuguese economy in the context of the global market, intervening on strategic dimensions such as innovation, scientific and technological development, internationalization, entrepreneurship and modernization of public administration
ROMANIA	Competitiveness Poles	• To foster the setting up and development of innovative enterprises / activities in enterprises resulting in an increased number of suppliers and clients on national and international markets via an integrated financing package of projects jointly developed by enterprises, R&D organisations, NGOs and public bodies
	Clusters	• To develop specific business structures (clusters) around productive activities aiming at increasing the added value of competitive products on national and international markets
SERBIA	Serbian Cluster Development Support Program	• To improve international competitiveneness • To introduce a new economic development policy in accordance with the EU standards and use the results in order to define key assumptions for fostering competitiveness in Serbia • Tto use clusters as a platform for new innovation policy which is under preparation
SLOVAKIA	Support to innovative industrial cluster organizations	• To develop individual measures of the Innovation Strategy of the Slovak Republic for 2007 to 2013 • To set up support mechanisms for the creation and development of innovation structures, innovation businesses, partnership and cooperation among businesses, universities and research institutes in the fields of research, development and innovation, and the establishment of conditions for

SPAIN	Cluster Development Catalonia	• To improve the competitiveness of Catalan companies by facilitating strategic change and upgrading their business toward more added value activities. • To strengthen innovation through cross-sectoral cooperation projects • To improve the professionalization of cluster managers and stimulate networking
SWEDEN	Vinnväxt	• To promote sustainable growth in regions by developing competitive research and innovation environments within specific growth fields
TURKEY	Support for the Improvement of International Competitiveness (UR-GE)	• To develop a joint action culture • To create new exporters • To create new export markets • To develop consultancy services capacity of Turkish companies
UNITED KINGDOM	Knowledge Transfer Networks	• To stimulate technology-enabled innovation through increased knowledge transfer, partnership formation, supply chain support and other relevant support

2.2.2 STRATEGIC FOCUS: ESTABLISHMENT OF NEW CLUSTERS OR SUPPORT OF MATURED CLUSTERS

Most programs support both the establishment of new cluster management organizations and the further development of already existing matured cluster management organizations.

Only a few programs concentrate either on the establishment of new cluster organizations or the further development of already existing matured cluster organizations. These programs - including the German programs "Go-Cluster" and "Cluster Offensive Bayern", the Norwegian programs "Norwegian Centres of Expertise" and "Arena", the Icelandic program "Strategic Research Program for Centres of Excellence and Research Clusters", the "Cluster Program Lower Austria", the French "Pôles de Compétitivité", the Lithuanian initiative "InnoCluster LT", the Romanian "Competitiveness Poles" and the Spanish/Catalan program "Cluster Development Catalonia" – have a dedicated strategic orientation towards either setting up cluster management organizations from scratch or towards the promotion of particular industries that are already cluster-driven to improve the global competitiveness of industry sectors that are relevant for the national economy.

Although such a clear focus on such a single specific objective is certainly an advantage for a cluster program as it supports the concentration of resources on the specific needs of clusters, programs that both establish new cluster organizations and further develop already existing matured cluster organizations do not have to be necessarily ineffective or inefficient. In their case it depends ultimately on how well developed the strategy and the set of instruments are and if they are applied in a way that ensures the addressing of the needs of both target groups. However, due to the different needs of young and matured cluster organizations it is most likely that more efforts by the program owners have to be made in terms of coordination. This may have a negative effect on the efficiency and effectiveness of a cluster program, if it is not equipped with sufficient resources, particular in terms of numbers and experience of staff.

The cluster programs of the younger EU member countries mostly support both the establishment of new cluster management organizations and the further development of already existing matured cluster management organizations. Romania has two cluster programs each of which specifically dedicates its effort to either the development of new cluster organizations or the further support of the already existing cluster management organizations.

Table 9: Strategic Focus: Creation of new or support of existing cluster management organizations?

COUNTRY	NAME OF THE PROGRAM	ESTABLISHMENT OF NEW CLUSTER ORGANIZATIONS	FURTHER DEVELOPMENT OF ALREADY EXISTING MATURED CLUSTER ORGANIZATIONS
AUSTRIA	Cluster Program Lower Austria		X
BELGIUM	Competence Centres-Light Structures	X	X
	Cooperative innovation network integrated project	X	X
CZECH REPUBLIC	Cooperation–Clusters	X	X
DENMARK	Innovation Networks Denmark	X	X
ESTONIA	Cluster Development Program	X	X
FINLAND	OSKE – Centres of Expertise Program	X	X
	SHOK – Strategic Centres for Science, Technology and Innovation	X	X
FRANCE	Grappe d'enterprises	X	X
	Les Pôles de Compétitivité		X
GERMANY	Competence Networks Germany		X
	Go-Cluster		X
	Cluster Offensive Bayern		X
	Cluster Policy Strategy of Hamburg	X	X
	Zentrales Innovationsprogramm Mittelstand – Netzwerkprojekte (ZIM NEMO)	X	
HUNGARY	Cluster Development Program of the New Széchenyi Plan	X	X
ICELAND	Strategic Research Program for Centres of Excellence and Research Clusters (RANNIS)	X	
	Regional Growth Agreements (Vaxtarsamningur)	X	X

ITALY	Innovation Clusters Piedmont	X	
LATVIA	Cluster Program	X	X
LITHUANIA	InnoCluster LT		X
	InnoCluster LT+		X
LUXEM-BOURG	Luxembourg Cluster Initiative	X	X
NORWAY	Norwegian Centres of Expertise (NCE)		X
	Arena Program	X	
POLAND	Polish Cluster Support	X	X
PORTUGAL	COMPETE	X	
ROMANIA	Competitiveness Poles		X
	Clusters	X	X
SERBIA	Serbian Cluster Development Support Program	X	X
SLOVAKIA	Support to innovative industrial cluster organizations		
SPAIN	Cluster Development Catalonia		X
SWEDEN	Vinnväxt	X	X
TURKEY	Support for the Improvement of International Competitiveness (UR-GE)	X	X
UNITED KINGDOM	Knowledge Transfer Networks	n.a.	n.a.

2.2.3 STRATEGIC OBJECTIVES IN TERMS OF NUMBERS OF CLUSTERS

Most programs do not have particular strategic objectives in terms of numbers of clusters that are funded, restrictions on thematic areas and coverage of the most important business sectors.

If there are such strategic objectives then they are motivated by the interest in a consolidated cluster landscape (e.g. in the case of Innovation Networks Denmark it was decided to limit the number of nationwide clusters) or in the concentration of efforts on the most important business sectors of the economy (e.g. Luxembourg Cluster Initiative, Innovation Networks Denmark, the Norwegian Centers of Expertise program or the Cluster Policy Strategy of the Free and Hanseatic City of Hamburg).

If a decision was taken to limit the number of clusters per thematic area it was motivated by concentrating efforts on specific clusters to increase the efficiency and effectiveness of the program and to increase the critical mass, the impact and the quality of the individual cluster organizations. To varying degrees this motivation has also informed the decisions of program owners who have decided for strategic limitations with regard to the total number of cluster that should be supported.

With regard to the limitation of numbers of clusters per thematic area some program owners pointed out that one has to balance between the interest in concentrating resources for the benefit of efficiency and effectiveness and the potential economic benefits that result from competition between clusters in the same thematic area.

Table 10: Strategic objectives of cluster programs

COUNTRY	NAME OF THE PROGRAM	When looking at the overall cluster policy of the country and the program in particular is there a strategy/objective with regard to cluster landscape in terms of …		
		… THE TOTAL NUMBER OF CLUSTERS?	… LIMITATIONS IN NUMBERS PER THEMATIC AREA?	… OF COVERING THE MOST IMPORTANT BUSINESS SECTORS OF THE ECONOMY?
AUSTRIA	Cluster Program Lower Austria	Yes	Yes	Yes
BELGIUM	Competence Centres-Light Structures	No	No	Yes
	Cooperative innovation network integrated project	No	No	Yes
CZECH REPUBLIC	Cooperation–Clusters, Czech Republic	Yes	No	No
DENMARK	Innovation Networks Denmark	Yes	Yes	Yes
ESTONIA	Cluster Development Program	No	No	Yes

FINLAND	OSKE – Centres of Expertise Program	Yes	Yes	Yes
	SHOK – Strategic Centres for Science, Technology and Innovation	No	Yes	Yes
FRANCE	Grappe d'enterprises	No	No	No
	Les Pôles de Compétitivité	Yes	No	Yes
GERMANY	Competence Networks Germany	No	No	No
	Go-Cluster	No	No	No
	Cluster Offensive Bayern	No	Yes	No
	Cluster Policy Strategy of Hamburg	No	Yes	Yes
	Zentrales Innovationsprogramm Mittelstand – Netzwerkprojekte (ZIM NEMO)	No	No	No
HUNGARY	Cluster Development Program of the New Széchenyi Plan, Hungary	No	No	No
ICELAND	Regional Growth Agreements (Vaxtarsamningur)	No	No	No
	Strategic Research Program for Centres of Excellence and Research Clusters	No	No	No
ITALY	Innovation Clusters Piedmont	Yes	No	Yes
LATVIA	Cluster Program	No	No	Yes
LITHUANIA	InnoCluster LT	No	Yes	Yes
	InnoCluster LT+	No	Yes	Yes
LUXEMBOURG	Luxembourg Cluster Initiative	No	No	No
NORWAY	Norwegian Centres of Expertise (NCE)	Yes	No	Yes
	Arena Program	No	No	Yes
POLAND	Polish Cluster Support	No	No	No

PORTUGAL	COMPETE, Portugal	Yes	Yes	Yes
ROMANIA	Competitiveness Poles, Romania	No	Yes	Yes
	Clusters, Romania	Yes	No	Yes
SERBIA	Serbian Cluster Development Support Program	Yes	No	Yes
SLOVAKIA	Support to innovative industrial cluster organizations	No	No	Yes
SPAIN	Cluster Development, Spain	Yes	Yes	Yes
SWEDEN	Vinnväxt	No	No	No
TURKEY	Support for the Improvement of International Competitiveness (UR-GE)	No	No	No
UNITED KINGDOM	Knowledge Transfer Networks	n.a.	n.a.	n.a.

With regard to the strategic decision whether there should be a limit of the number of clusters per thematic area the discussion of this pattern with some of the program owners put a very interesting question on the table. According to Porter "[c]lusters promote competition and cooperation. Rivals compete intensively to win and retain customers. Without vigorous competition, a cluster will fail". [10] Porter's argument is focusing on competition between companies within the cluster. Why should not there be also competition between the cluster management organizations when they apply for public support? Competition for limited public funds due to the decision of the program agency to support only one cluster management organization in the thematic area of XYZ puts pressure on cluster management organizations to focus their efforts on areas and activities where they can create the most benefits for their cluster members. A wider spectrum and a higher frequency of services for the cluster members which in turn trigger economic activities e.g. of SME (for further details about the link between services and impact) would be one of the results of such a competition. Although there are certainly restrictions for such an approach – e.g. in larger countries it can make economic sense to have several clusters in a specific thematic area due to the regional concentrations of relevant cluster stakeholders -, limiting public means to a few eventual beneficiaries would definitely encourage cluster management organizations to think about how they can be better than their competitors. Competition is always good to encourage rethinking whether one is taking the right decisions.

2.2.4 TOP-DOWN OR BOTTOM-UP

Bottom-up is the approach of program implementation favored by the majority of the program owners (see table 11). Although setting the legal frame of the program through funding guidelines, most programs take only general decisions in terms of which sectors or projects should be developed by cluster management organizations. In this regard the implementation of the program is left to the cluster management organization. Program owners agreed on the opinion

10 Michael E. Porter, 1998: Clusters and the New Economics of Competition, in: Harvard Business Review, November 1998, p. 78

that cluster management organizations and their affiliated members know best which projects they should focus on to create value or which organizational models they should follow to ensure efficiency and effectiveness of operations.

In cases where program owners answered that they follow both a top-down and a bottom-up approach bottom-up implementation was clearly the dominating program rationale. In these cases the top-down element was motivated either because program owners had specific requirements with regard to the structure of the project consortium or they emphasized their interest in interfering in cluster operations e.g. to motivate mergers with other clusters or a strategic reorientation.

There are only three cluster programs, the "Cluster Offensive Bayern", the "Innovation Clusters Piedmont", and "Competence Centers – Light Structures" of Belgium which follow a dedicated top-down approach. Within "Cluster Offensive Bayern" both the industry areas in which clusters are supported as well as the organizations that are responsible for the development of the cluster were chosen by the ministry prior to the start of the program. However, in terms of their operations the cluster organizations act without interference from the supervising Ministry of Economic Affairs, Infrastructure, Transport and Technology.

The initiative "Innovative Clusters Piedmont" created 12 innovation clusters from 12 technological domains by benefitting from the ERDF Regional Operational Program. The cluster managing authorities needed to control the 12 domains were installed through a national call for proposals in 2009.

Table 11: Strategic approach: top-down or bottom-up

COUNTRY	NAME OF THE PROGRAM	TOP-DOWN	BOTTOM-UP
AUSTRIA	Cluster Program Lower Austria	X	X
BELGIUM	Competence Centres-Light Structures	X	
	Cooperative innovation network integrated project		X
CZECH REPUBLIC	Cooperation–Clusters	X	X
DENMARK	Innovation Networks Denmark	X	X
ESTONIA	Cluster Development Program	X	X
FINLAND	OSKE – Centres of Expertise Program		X
	SHOK – Strategic Centres for Science, Technology and Innovation	X	X
FRANCE	Grappe d'enterprises		X
	Les Pôles de Compétitivité	X	X

GERMANY	Competence Networks Germany	n.a.	n.a.
	Go-Cluster	n.a.	n.a.
	Cluster Offensive Bayern	X	•
	Cluster Policy Strategy of Hamburg	X	X
	Zentrales Innovationsprogramm Mittelstand – Netzwerk-projekte (ZIM NEMO)		X
HUNGARY	Cluster Development Program of the New Széchenyi Plan	X	X
ICELAND	Regional Growth Agreements (Vaxtarsamningur)		X
	Strategic Research Program for Centres of Excellence and Research Clusters		X
ITALY	Innovation Clusters Piedmont	X	
LATVIA	Cluster Program	X	X
LITHUANIA	InnoCluster LT		X
	InnoCluster LT+		X
LUXEMBOURG	Luxembourg Cluster Initiative	X	X
NORWAY	Norwegian Centres of Expertise (NCE)		X
	Arena Program		X
POLAND	Polish Cluster Support		X
PORTUGAL	COMPETE	X	X
ROMANIA	Competitiveness Poles		X
	Clusters, Romania		X
SERBIA	Serbian Cluster Development Support Program		X
SLOVAKIA	Support to innovative industrial cluster organizations		X
SPAIN	Cluster Development		X
SWEDEN	Vinnväxt	X	X
TURKEY	Support for the Improvement of International Competitive-ness (UR-GE)	X	X
UNITED KINGDOM	Knowledge Transfer Networks	X	

2.2.5 INSTRUMENTATION

Grant funding is the main instrument of nearly all cluster programs, while technical assistance for capacity development of cluster management organizations and its members is applied by only half of the programs (see table 12).
All program owners agreed that the provision of funding is not sufficient to develop cluster management organizations that are capable to drive the sustainable development of a cluster. However, not all program owners provide technical assistance for capacity development (e.g. through trainings and consultancy services) that goes beyond internet platforms and regular meetings between program owners and cluster managers. The Luxembourg Cluster Initiative and the Cluster Program Lower Austria do not provide grant funding at all, but only technical assistance for cluster management organizations through different workshops, working groups, benchmarking, matchmaking but also individual services.

In most cases where programs provide technical assistance this was done right from the start of the program being a part of the program strategy. Programs that do not provide technical assistance are either considering this (e.g. the Icelandic Strategic Research Program for Centres of Excellence and Research Clusters) or have to rely on other institutions that are not directly affiliated with the program (e.g. the French program Grappe d'entreprises).

The extent to which technical assistance can be provided depends on the resources available to the programs. While the German project "go-cluster" can rely on more than 15 people to organize trainings and workshops, other programs have smaller resources available which in turn results into a less frequent and rather small-scale provision of technical assistance.

Table 12: Instruments of cluster programs

COUNTRY	NAME OF THE PROGRAM	FUNDING	TECHNICAL ASSISTANCE (E.G. PROVISION OF TRAINING AND CONSULTANCY SERVICES)
AUSTRIA	Cluster Program Lower Austria		X
BELGIUM	Competence Centres-Light Structures	X	X
	Cooperative innovation network integrated project	X	X
CZECH REPUBLIC	Cooperation–Clusters	X	
DENMARK	Innovation Networks Denmark	X	X
ESTONIA	Cluster Development Program	X	X
FINLAND	OSKE – Centres of Expertise Program	X	
	SHOK – Strategic Centres for Science, Technology and Innovation	X	
FRANCE	Grappe d'enterprises	X	
	Les Pôles de Compétitivité	X	

GERMANY	Competence Networks Germany		X
	Go-Cluster		X
	Cluster Offensive Bayern	X	X
	Cluster Policy Strategy of Hamburg	X	
	Zentrales Innovationsprogramm Mittelstand – Netzwerkprojekte (ZIM NEMO)	X	
HUNGARY	Cluster Development Program of the New Széchenyi Plan	X	X
ICELAND	Regional Growth Agreements (Vaxtarsamningur)	X	
	Strategic Research Program for Centres of Excellence and Research Clusters	X	
ITALY	Innovation Clusters Piedmont	X	X
LATVIA	Cluster Program	X	X
LITHUANIA	InnoCluster LT	X	
	InnoCluster LT+	X	
LUXEMBOURG	Luxembourg Cluster Initiative		X
NORWAY	Norwegian Centres of Expertise (NCE)	X	X
	Arena Program	X	X
POLAND	Polish Cluster Support	X	X
PORTUGAL	COMPETE	X	
ROMANIA	Competitiveness Poles	X	X
	Clusters	X	X
SERBIA	Serbian Cluster Development Support Program	X	X
SLOVAKIA	Support to innovative industrial cluster organizations		X
SPAIN	Cluster Development	X	X
SWEDEN	Vinnväxt	X	X
TURKEY	Support for the Improvement of International Competitiveness (UR-GE)	X	X
UNITED KINGDOM	Knowledge Transfer Networks	X	X

2.2.6 TECHNICAL DETAILS: TERM AND FINANCIAL ASPECTS OF CLUSTER PROGRAMS

Table 13 (next page) provides an overview for each cluster program about its term, budget, and type of funding, technology focus, funding periods, maximum funding and financing structure of projects. Like in terms of their objectives cluster programs are also quite diverse with regard to their technical details. Programs very much differ in terms of the maximum amount of funding for a project and the duration of funding. Only a few programs support cluster initiatives to 100 per cent, most programs co-fund initiatives to 50 or 75 per cent of the total project budget.

Table 13: Term of cluster programs and financial aspects[1]

	Cluster Program Lower Austria	Competence Centres Light Structures, Belgium	Cooperative innovation network integrated project, Belgium	Cooperation-Clusters, Czech Republic	Innovation Networks Denmark	Cluster Development Program, Estonia	OSKE – Centres of Expertise Program, Finland	SHOK – Strategic Centres for Science, Technology and Innovation, Finland	Grappe d'entreprises, France	Les Pôles de Compétitivité, France	Go-Cluster, Germany	Cluster Offensive Bayern, Germany	Zentrales Innovationsprogramm Mittelstand – Netzwerkprojekte (ZIM-NEMO), Germany	Competence Networks, Germany	Cluster Development Program of The New Economy Plan, Hungary	Regional Growth Agreements [Vaxtarsamningar], Iceland	Strategic Research Programmes, Centres of Excellence and Research Clusters, Iceland	Innovation Clusters Piedmont, Italy	Cluster Program, Latvia	InnoCluster LT, Lithuania	InnoCluster LT+, Lithuania	Luxembourg Cluster Initiative	Norwegian Centres of Expertise (NCE), Norway	Arena Program, Norway	Innovative Economy Operational Programme 2007-2013, Priority 1.5 "Support of the Development of supra-regional clusters", Poland	Operational Program Development of Eastern Poland 2007-2013, Priority 1.4 "Promotion and cooperation" with Measure 1.4."Cooperation – cluster creation and development" Poland	COMPETE, Portugal	Competitiveness Poles, Romania	Clusters, Romania	Serbian Cluster Development Support Program, Serbia	Support to innovative industrial clusters in Bratislava, Slovakia	Cluster Development, Catalonia, Spain	Vinnväxt, Sweden	Support for the internationalisation of bi-lateral/international Competitiveness (UR-GE), Turkey	Knowledge Transfer Networks, UK
TERM OF THE PROGRAM	2007-2013	2011 – ongoing	2010 - ongoing	2007-2013	2005 - ongoing	2007-2013	2007-2013	Since 2006	2009 -ongoing	2005-2012	2011-2014	2006 - ongoing	2008-2013	1997-2012	2007-2013	2010-2013 (current period)	2008-2015	2007-2013	2007-2013	2007-2013	2007-2013	2010 – ongoing	2006 - ongoing	2002 - ongoing	2007-2013	2008-2015	2007-2013	2012-2015	2012-2015	2007-2013	2011-2013	2005 - ongoing	2002-2015	2010	2005-2014
BUDGET	EUR 20.5 million in total	EUR 19 million p.a.	EUR 15 million p.a.	EUR 90 million in total	EUR 8- 10 million p.a.	EUR 15.6 million	n.a.	n.a.	EUR 24 million	EUR 1.5 million/	EUR 1 million p.a.	EUR 6 million p.a.	EUR 52,2 million	EUR 1 million p.a.	EUR 600 million	EUR 3.8 million	EUR 6.8 million	EUR 90 million in total	2007-2013	"Cluster program" (2012-2015) EUR 4.8 million (ERDF) "Cluster development program" (2007-2011) EUR 37.5 million (State budget)	EUR 9.5 million in total	EUR 57 million in total	The Luxembourg Cluster Initiative has no allocated budget, but benefits from resources provided by Luxembourg's Ministry of the Economy, Innovation and Research, to enable it to develop its various services.	EUR 8.9 million p.a.	EUR 5 million p.a.	EUR 104 million	EUR 1 million	EUR 452 million	EUR 80 million in total	EUR 20 million in total	EUR 1.6 million	n.a.	EUR 5.1. million	EUR 8.8 million p.a.	EUR 5 million p.a.	EUR 21 Million p.a.
TYPE OF FUNDING	Technical assistance (= Basic Support for Cluster Management)	Subsidies 80% of accepted costs	Subsidies 80% of accepted costs	Grant funding	Grant funding and technical assistance	Grant Funding	Grant funding	Grant funding and loans	Grant funding	Grant Funding	Only the management agency is funded to provide technical assistance. No funding of individual clusters.	Grant funding and technical assistance	Grant funding	Only the management agency is funded to provide technical assistance. No funding of individual clusters.	Grant funding	Grant funding	Grant funding	Grant funding	Grant Funding	Grant funding	Grant funding	Provision of technical assistance. No funding of individual clusters	Grant funding and technical assistance	Grant funding and technical assistance	Grant funding	Grant funding	Public System of Incentives	Grant funding	Grant funding	Grant funding	Grant funding and technical assistance	Grant Funding	Grant funding
DOES THE PROGRAM HAVE A SPECIFIC TECHNOLOGY FOCUS?	No	No	No	No	No	To some extent. The following sectors are prioritised: biotechnology, ICT and material technology, energy, healthcare and environmental technology. A project that is directly or indirectly involved with these sec- tors will get bonus points in the evaluation process (5% out of 100%)	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
MAXIMUM FUNDING PERIOD FOR A PROJECT	n.a.	Four years	Six years	Up to three years	Four years per period (can be extended after a positive evaluation)	Preliminary applications: max. 12 months. Full applications: max. 48 months	One year	Five years	Three years	For R&D pro jects: 4s, normally 5 year projects. For innovation platforms: 5 years (possi- ble extension) For the cluster management: Until the end of the second phase of the program 2012. A third phase should begin in 2013.	n.a.	There is no maximum funding period.	Four years	n.a.	Three years	There is no maximum funding period.	Seven years	Up to one year	3 years	Up to 30 months	Up to three years	n.a.	Ten years	Up to five years	There is no maximum funding period.	There is no maximum funding period.	n.a.	Up to two years	Up to two years	Eight months	n.a.	One year	Two years	3 years	3 years with an option of an extension of 2 years
IS THERE A MAXIMUM AMOUNT OF FUNDING FOR APPLICANTS CAN APPLY FOR?	n.a.	EUR 2,5 million, depending on type of project.	No	Max. EUR 3.5 million in total	Not formally. But in reality max EUR 1 million p.a.	Preliminary applications: max. EUR 50,000 Full applications: no specific limit set	EUR 140.000	There is no maximum amount.	EUR 500.000	No	n.a.	There is no maxi mum amount.	EUR 350.000	n.a.	EUR 500.000	There is no maximum amount of funding	EUR 3.4 million	Max. EUR 20 million	Yes. Max. EUR 0.42 million per one project. Max. EUR 2.1 million thousands for one collaboration partner.	Max. EUR 450.000	Max. EUR 11 million	n.a.	Max. EUR 770.500 p.a.	Max. EUR 300.000 p.a.	EUR 5 million	There is no maximum amount.	The maximum funding granted to each applicant will be assessed with the number of project approved.	Max. EUR 20 million	Max. EUR 1 million	EUR 25.000	n.a.	No	Max. EUR 1.1 million p.a.	Max. EUR 1.6 mio	Overal expenditure needs to fit into the framework of annual budget law, max. currently EUR 2.1 Million p.a, but is not fixed
FINANCING STRUCTURE OF PROJECTS	60% of regional fund of program, 28% ERDF, 12% fees	Coordination activities 80% of eligible costs are accepted	80% of eligible costs are accepted	Max. 60% funding from the program	Max. 50 % national government co-financing	Preliminary applications: max. 75% funding Full applications: max. 70% funding Entrepreneurs must provide at least 50% of the entire amount of self-financing.	Max. 50% from the ESAG program	Max. 75% for the establishment of the centers and for research programs carried out by them. Max. 50 % for cluster projects by companies.	Max. 25% funding from the program	For R&D projects between 25% and 45 % For innovation platforms: from 15% to 50%	n.a.	Max. 75 % funding from the program, share is currently decreased as clusters are expected to increase the share of private co-financing	In the initial phase the project can be co-funded with up to 90% of eligible costs to develop a network concept, but the share of public funding will be reduced to 50% in the last phase. Most of the project duration when the network concept is implemented (75% 0 50% 0 30%)	n.a.	Max. 50% funding from New Hungary Development plan and private sources	Max. 50 % funding from the program	Max. 25% funding from the program	Max. 50% funding from the program	Cluster management activities: up to 90% Cluster services provided for collaborative partners: up to 85%	Up to 50%	50%, 60%, 70% funding from the program depending on conditions	n.a.	50% funding from the NCE program	Max. 50% funding from the program	Up to 100% funding from the program	Up to 75% funding from the program.	n.a	From 25% up to 100% funding from the program depending on conditions	From 25% up to 100% funding from the program depending on conditions	Up to 50% eligible costs	n.a.	Max. 75% funding from the program	Max. 50% funding from the program	Need Analysis including training and joint consultancy for companies Trade Mission Buyers' Mission Employment (two project staff + one administration organisation fee for 3 years) Consultancy (optional, after completion of joint 3 years)	100% grant funding for core programme, but extra income from public and private sources is encouraged (ranges from 0 to 100% currently)

1) The Cluster Policy Strategy of the Free and Hanseatic City and the Slovakian cluster program Bratislava Region are not mentioned in the table because they are not cluster programs in a narrow sense as all different funding programs from SIPA (from restrictive and governance levels) that are relevant for the cluster Policy Strategy (Bratislava) and the capacities of the region.

2.3 KEY FINDINGS

The benchmarking of cluster programs has yielded twelve key findings which are further detailed in this chapter (see Table 14). The key findings provide further insight in the specific characteristics of the different cluster programs and give guidance for the future development of cluster programs.

Table 14: Overview of key findings

KEY FINDINGS	
1.	Different types of cluster programs serve different purposes.
2.	Most cluster programs feature high on the government's agenda.
3.	Coordination with other funding programs shows room for improvement.
4.	Internationalization of clusters is considered to be important, but the relevance of supporting internationalization of clusters varies between the different programs.
5.	Program owners take over a more active role towards developing individual clusters.
6.	Cluster Management Excellence has become more and more important in recent years.
7.	Monitoring and evaluation is important, but difficult.
8.	Cluster policy has become more important with the EU enlargement.
9.	The European Regional Development Fund Approach has led to good linkages between innovation support programs and cluster programs.
10.	Independent from the kind of support they provide the cluster programs are equally integrated in national policies.
11.	The cluster programs' strategic focus of either launching new clusters or supporting matured ones towards excellence is equally integrated in the policy agendas of the EU Member States.
12.	The budget provided for cluster programs is independent from the gross domestic product p.c. of the respective country.

12 A functional region is a territorial unit resulting from the organisation of social and economic relations in that its boundaries do not reflect geographical particularities or historical events. It is thus a functional subdivision of territories. The most typical concept used in defining a functional region is that of labour markets (OECD, 2002: Redefining Territories. The Functional Regions, p. 11).

13 There is no commonly accepted definition of a regional system of innovation. Common to all understandings is a set of interacting public and private interests, formal institutions and other organizations that function according to organizational and institutional arrangements and relationships conducive to the generation, use and dissemination of knowledge. This set of actors produces pervasive and systemic effects that encourage companies within the region to develop specific forms for capital that is derived from social relations, norms, values and interaction within the community in order to reinforce regional innovative capability and competitiveness (Doloreux, David/Parto, Saaed, 2004: Regional Innovation Systems: A Critical Review, p. 9, United Nations University INTECH – Institute for New Technologies Discussion Paper Series, Maastricht).

2.3.1 DIFFERENT TYPES OF CLUSTER PROGRAMS SERVE DIFFERENT PURPOSES

There are four principle types of cluster programs. Of course, there are overlaps between the different types and a program can feature elements that are also typical of a different type of program. However, the analysis of the objectives and strategies of the different cluster program reveals the following main types of cluster programs:

- **I) Cluster programs that focus on regional economic development:**
  All programs that fit into this category aim at the promotion of regional growth through the development of business-driven clusters that are internationally competitive. Common to all these programs is a focus on specific regions that are geographically limited. There are different ways of setting such a limit: programs may set their geographical limit in terms of administrative borders (e.g. in Germany the cluster programs of the federal states) or they define regions from an economic geography perspective, e.g. by referring to "functional regions"[12] that do not have to be congruent with administrative regions and their borders. In this context the rationale of developing regional systems of innovation[13] is explicitly stressed by some programs (the Swedish Vinnväxt, Innovation Clusters Piedmont (Italy) and Cluster Development Catalonia (Spain)).

- **II) Cluster programs that focus on the development of national industries**
  Characteristic of this type of cluster program is the objective of developing business-driven clusters that represent national industries that are internationally competitive. This type of program supports already developed regional systems of innovation in their efforts to utilize their potential for further national and international growth. The national cluster champions are targeted by this kind of programs. Often rooted in a regional economic development rationale the programs go beyond the regional dimension as they try to overcome regional lock-in effects by promoting national and international collaboration with other clusters.

- **III) Cluster programs that focus on the commercial exploitation of the R&D potential of a country's economy**
  The third type of cluster programs is characterized by a focus on the establishment of clusters or centers of excellence that are either driven mainly by research actors or are aimed at bridging gaps between the research and the business sectors. Although these type of program shares the objective of promoting economic growth with

the other types of cluster programs, it is different as it puts more emphasis on the development of the research sector in terms of the commercialization of its R&D results.

- **IV) Network programs to support the competitiveness of national industries**
  This type of program is not a cluster program in the narrow sense as it promotes the establishment of industry-driven R&D networks that need not necessarily be rooted in regional environments, but can be organized nationwide. However, a network created through this kind of program may form the nucleus of a cluster.

The programs that have participated in the policy bench marking can be structured according to the different categories of programs as follows:

Table 15: Different categories of cluster programs

TYPE OF CLUSTER PROGRAM	NAME AND COUNTRY OF CLUSTER PROGRAM
CLUSTER PROGRAMS THAT FOCUS ON REGIONAL ECONOMIC DEVELOPMENT	• Cluster Offensive Bayern (Germany) • Cluster Strategy of Hamburg (Germany) • Vinnväxt (Sweden) • Arena (Norway) • Polish Cluster Support (Poland) • Regional Growth Agreements (Vaxtarsamningur) (Iceland) • Cluster Program Lower Austria (Austria) • Innovation Clusters Piedmont (Italy) • Cluster Development Catalonia (Spain)
CLUSTER PROGRAMS THAT FOCUS ON THE DEVELOPMENT OF NATIONAL INDUSTRIES	• Innovation Networks Denmark • OSKE – Centre of Expertise Program (Finland) • Competence Networks Germany • Go Cluster, Germany • Norwegian Centres of Expertise (Norway) • Polish Cluster Support (Poland) • Grappe d'entreprises (France) • Les Pôles de Compétitivité (France) • Competence Centres – Light Structures (Belgium) • Cooperative Innovation Network Integrated Project (Belgium) • Cooperation-Clusters (Czech Republic) • Cluster Development Program (Estonia) • InnoCluster LT and InnoCluster LT+ (Lithuania) • COMPETE (Portugal) • Competitivness Poles (Romania) • Clusters (Romania) • Serbian Cluster Development Program (Serbia) • Cluster Program, Latvia • Support for the Improvement of International Competitiveness (UR-GE), Turkey • Support to innovative industrial cluster organizations, Slovakia • Luxembourg Cluster Initiative
CLUSTER PROGRAMS THAT FOCUS ON THE COMMERCIAL EXPLOITATION OF THE R&D POTENTIAL OF A COUNTRY'S ECONOMY	• Strategic Research Program for Centres of Excellence and Research Clusters (Iceland) • Strategic Centres of Excellence (SHOK) (Finland) • Cluster Development Program of the New Széchenyi Plan (Hungary)
NETWORK PROGRAMS TO SUPPORT THE COMPETITIVENESS OF NATIONAL INDUSTRIES	• Zentrales Innovationsprogramm Mittelstand - Netzwerkprojekte (ZIM-NEMO) (Germany)

Norway and Germany, but also France are good examples of how different types of cluster programs with their corresponding purposes are linked with each other:

- According to the program strategies the Norwegian Arena program can act as a qualifying arena for the Norwegian Centres of Expertise program for regional clusters with a development potential which have not yet developed sophisticated cooperative and strategy fundamentals.
- Many clusters that are member of Go-Cluster (Germany) are supported by different regional cluster programs of the Federal States in Germany. Furthermore, many members of Go-Cluster are also funded by other programs of the Federal Government such as the Zentrales Innovationsprogramm Mittelstand (ZIM) of the Federal Ministry of Economics and Technology (BMWi).[14] Some clusters of Go-Cluster are also part of the Spitzencluster-Wettbewerb of the Federal Ministry of Education and Research; a program which supports leading research-driven clusters in Germany.[15] This program setting, which consists of a wide array of programs both from the federal and the regional level, complements technical assistance for cluster development through Go-Cluster with grant funding from other programs.
- Clusters that are members of Innovation Networks Denmark can also participate in other innovation support programs. There are several projects of cluster members which are financed by the Danish innovation consortium scheme, which is a scheme similar to the German Zentrales Innovationsprogramm Mittelstand (ZIM) – Netzwerkprojekte (ZIM-NEMO) program. Some clusters of the Innovation Networks Denmark initiative also participate in the three large Danish Strategic Platforms for Research and Innovation (the Danish SPIR Clusters).
- The French program Grappe d'entreprises was set up to bridge the gap between the program Pôle de Compétitivité that supports R&D-driven cluster development and the business sector through the establishment of business-driven cluster of Grappe d'entreprises with links to cluster of Pôle de Compétitivité.

Such linkages can create synergy effects through complementary objectives and funding lines, but in terms of overall efficiency and effectiveness as well as less bureaucracy special coordination efforts on behalf of the program agencies may be required.

2.3.2 MOST CLUSTER PROGRAMS FEATURE HIGH ON THE GOVERNMENT'S AGENDA

Asked how important their program features in the overall national or regional policy context[16] 24 out of 32 experts assessed its relevance as important or very important in relation to the overall economic/industrial development strategy (see Figure 20). Programs were rated high in terms of importance if they were either embedded in an overall national strategy or do matter in terms of their budget. Being embedded in an overall national or regional strategy seems to be a key factor for the relevance of a cluster program as program officials who have ranked their programs as either medium relevant or not relevant explained their assessment with the absence of such a strategy. Some program officials explained the low or medium relevance by referring to small program budgets.

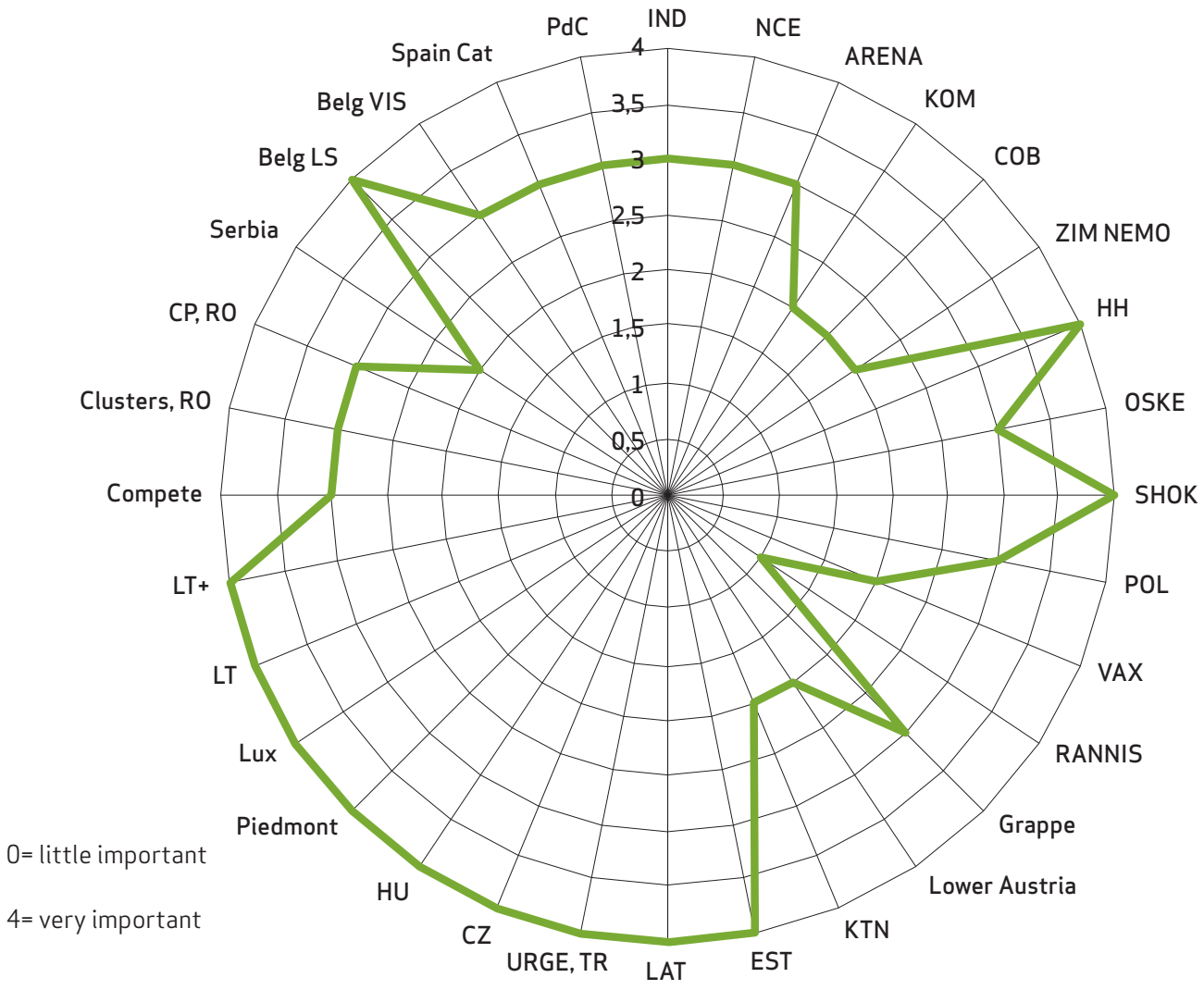
Against this backdrop the importance of a cluster program has to be understood – in the context of this analysis – in terms of being embedded in an overall policy strategy and availability of a significant budget. Low relevance should not be understood as "cluster programs do not matter from the government's point of view". All cluster programs that were benchmarked in this project matter from the government's point of view and are considered as being important from an economic policy point of view.

14 The Zentrale Innovationsprogramm Mittelstand (ZIM) (Central Innovation Program SME) of the Federal Ministry of Economics and Technology supports innovation activities through three sub-programs: 1) Support of collaborative projects (ZIM-KOOP), 2) Support of individual projects of SME (ZIM-Solo) and 3) Support of network projects (ZIM-NEMO). For further details on the ZIM program please see www.zim-bmwi.de. For further information about the third sub-program, Support of network projects (ZIM-NEMO), please see also the appendix to this report.

15 Four out of the ten current Spitzencluster are member of the Go-Cluster initiative. For more information about the Spitzencluster-Wettbewerb (Leading-edge cluster competition) please see www.bmbf.de/en/10726.php.

16 The majority of the programs that were benchmarked in this project are programs that were initiated or are implemented by national agencies or government departments. Exemptions from this rule include the German federal state programs Cluster Offensive Bayern and Clusterstrategie Hamburg.

Figure 20: How important is the cluster program in relation to the overall national or regional economic/industrial development strategy?

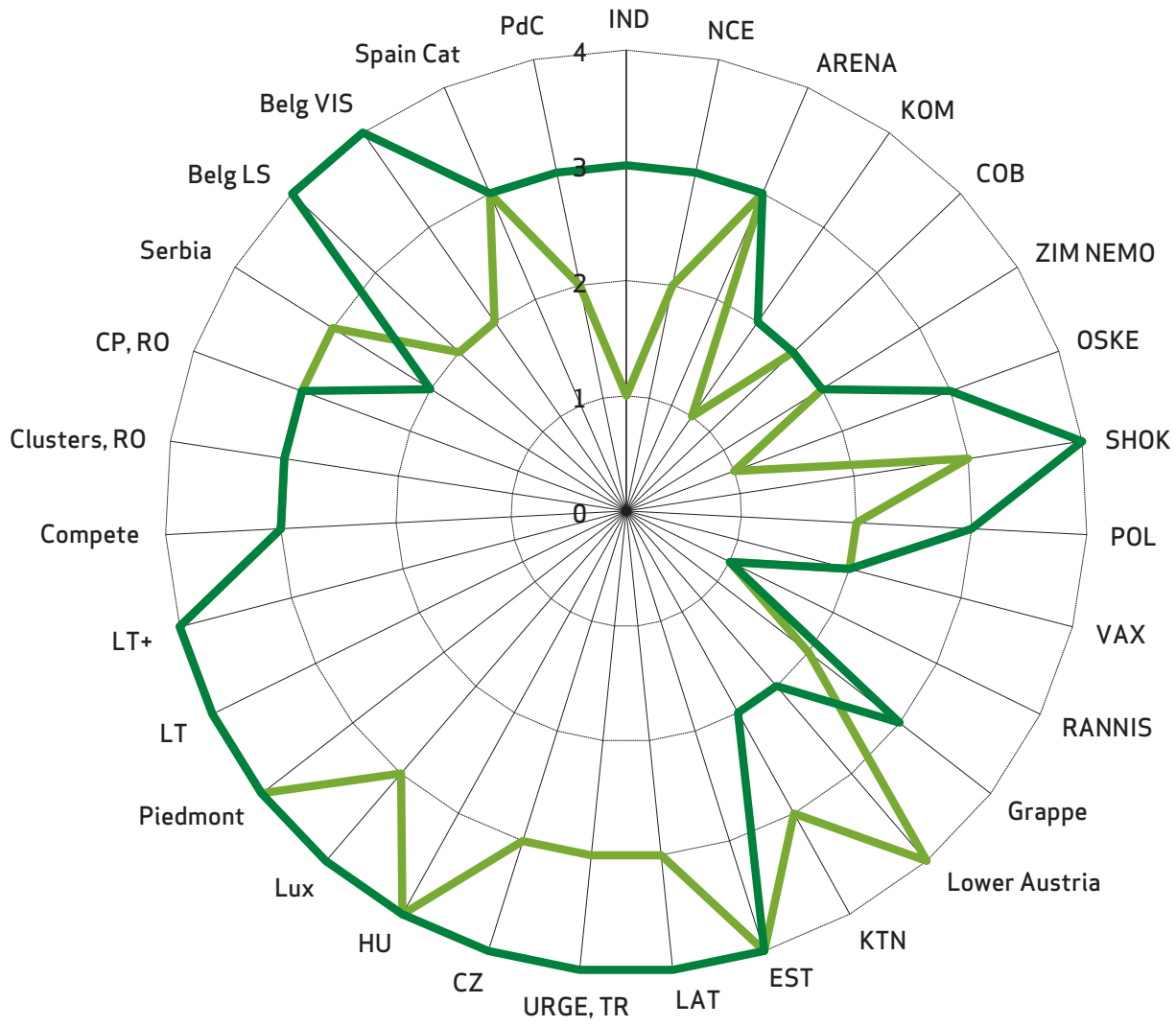


2.3.3 COORDINATION WITH OTHER FUNDING PROGRAMS SHOWS ROOM FOR IMPROVEMENT

High relevance of the cluster program does not necessarily translate into a good coordination with other funding programs that could provide additional support for the development of clusters through funding of business, R&D and infrastructure (including educational infrastructure) projects. Cluster programs seem to be much better coordinated with other R&D programs (20 programs out of 33 are rated as strongly coordinated with other R&D programs) than with business and infrastructure programs (11 programs out of 33 are rated as strongly coordinated with business and infrastructure programs) (see Figure 21-24).

Although the specific national policy context and the specific objectives of the cluster programs have to be kept in mind when analyzing the coordination with other programs in more detail, further attention should be paid in future analysis to this finding, as a well-coordinated framework of funding programs can be expected to increase the efficiency and effectiveness of public support measures. With a cluster support program at the core, additional individual R&D/innovation, business development and infrastructure programs can address the specific needs of the different actors within a cluster. In this regard strategies, instruments, time frames and target groups of programs should be coordinated and efforts should be made to limit administrative burdens for applicants as much as possible.

Figure 21: Coordination of cluster programs with other business development programs



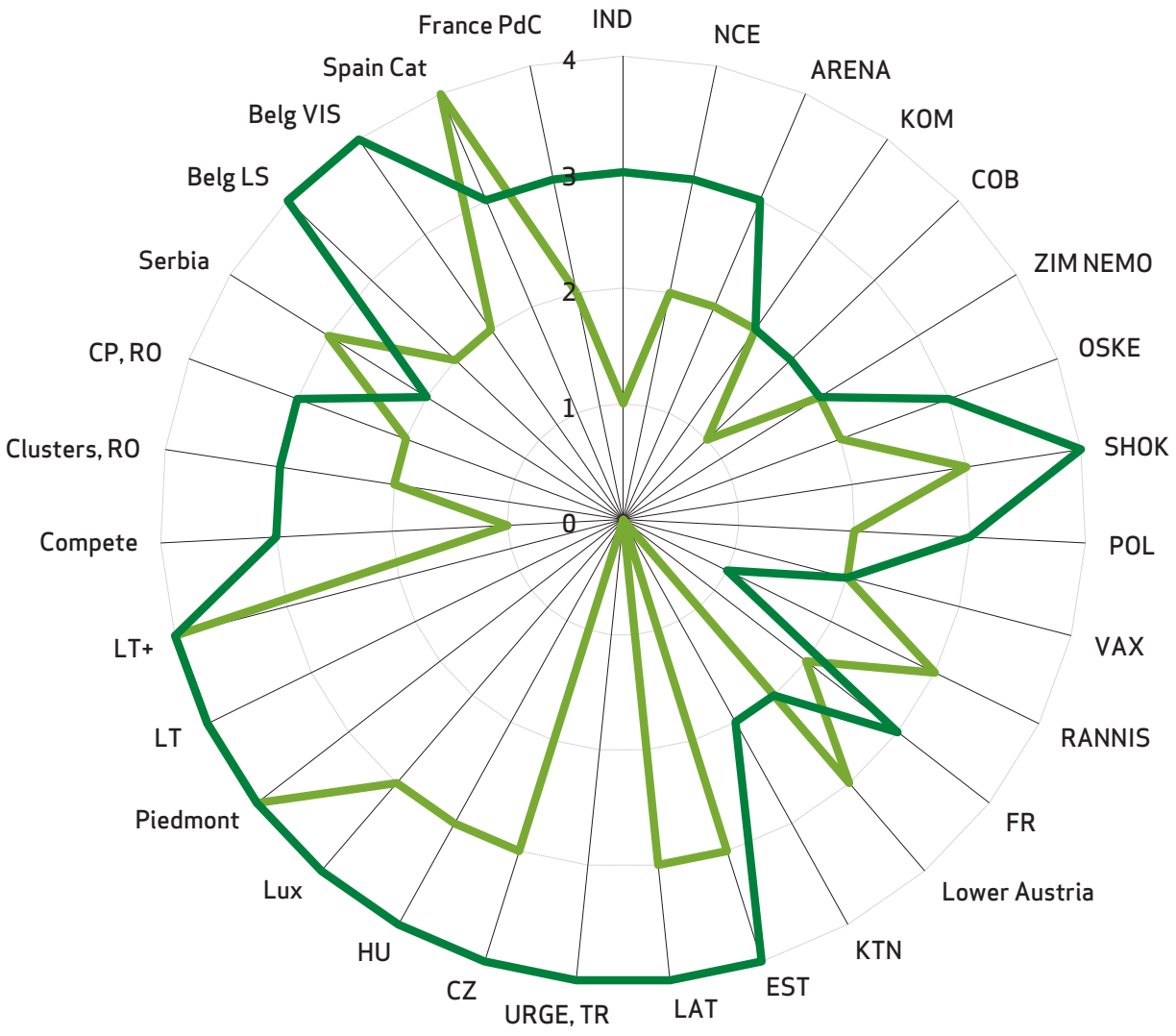
Coordination with business development programs

Relevance in relation to the overall economic/industrial development strategy

COORDINATION: 0= weak > 4= strong

RELEVANCE: 0= not important at all > 4 = very important

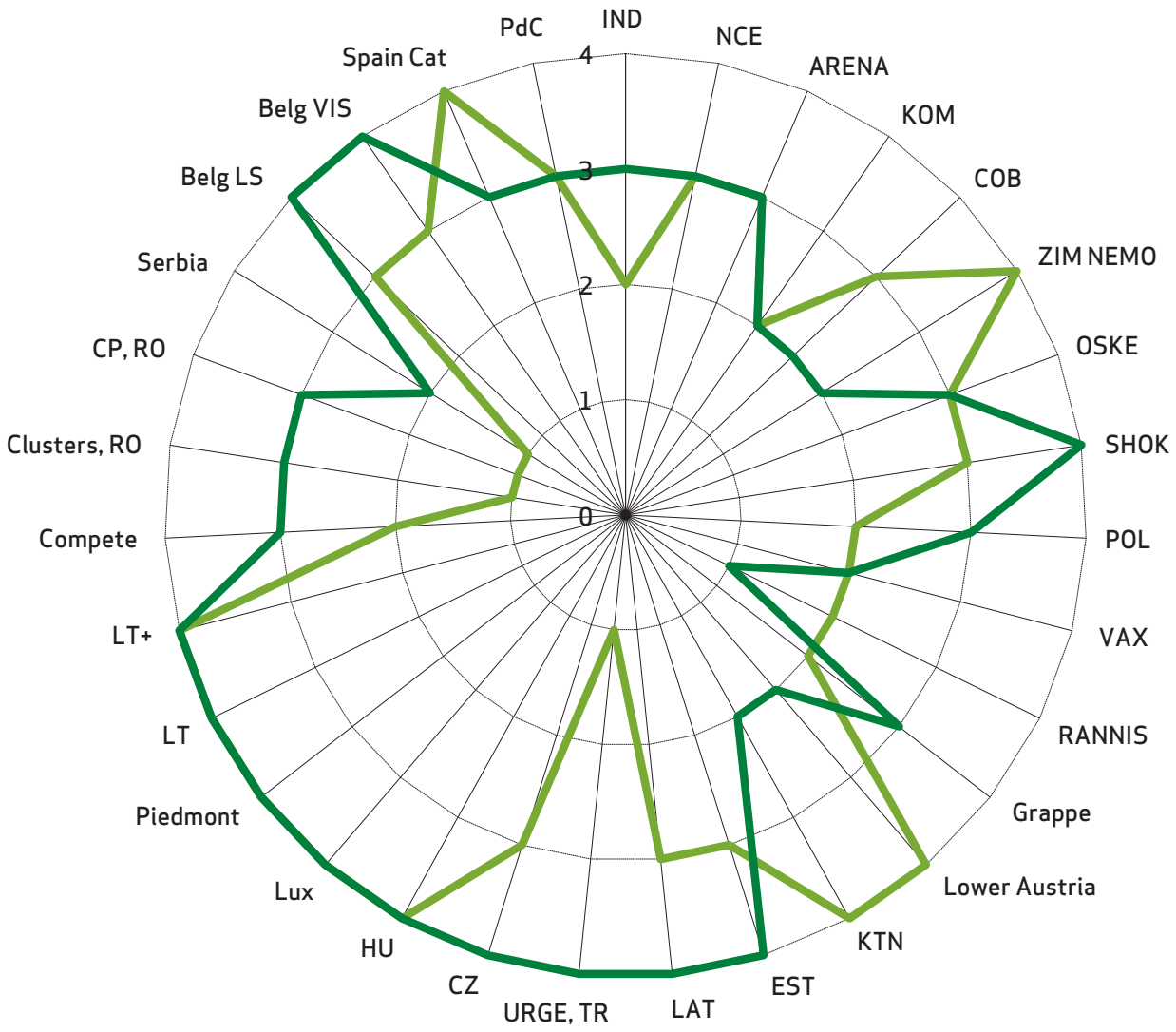
Figure 22: Coordination of cluster programs with infrastructure programs
(e.g. support of universities and other educational institutions)



COORDINATION: 0= weak > 4= strong

RELEVANCE: 0= not important at all > 4 = very important

Figure 23: Coordination of cluster programs with other R&D/innovation support programs



COORDINATION: 0= weak > 4= strong

RELEVANCE: 0= not important at all > 4 = very important

2.3.4 INTERNATIONALIZATION OF CLUSTERS IS CONSIDERED TO BE IMPORTANT, BUT THE RELEVANCE OF SUPPORTING INTERNATIONALIZATION OF CLUSTERS VARIES BETWEEN THE DIFFERENT PROGRAMS

All program owners consider internationalization of clusters as an important objective of cluster programs. International competitiveness of clusters is considered to be a key element of maintaining and further developing the competitiveness of the country's economy in the global context. From the survey it can concluded that all program owners agree on the importance of internationalized clusters which has to be facilitated through support instruments that meet the needs of the clusters. Consequently, this is reflected by program guidelines and evaluation criteria for project proposals. However, the programs differ in terms of actual relevance of internationalization support and instruments that are used to facilitate internationalization of clusters.

Table 16 provides an overview of the self-assessment given by program officials (23 answers) in terms of the relevance attached to the support of international activities. They were asked to indicate how prominent the support of internationalization features in their program:

Table 16: Relevance of the support of international activities of clusters

RELEVANCE	NAME OF THE PROGRAM
HIGH	Norwegian Centres of Expertise
	Polish Cluster Support
	Grappe d'entreprises (France)
	Cluster Offensive Bayern (Bavarian Cluster Initiative)
	Competence Networks Germany
	Go-Cluster Germany
	Cluster Program, Latvia
	Cluster Development Program, Estonia
	Innovation Networks Denmark
	Cluster Development Program of the New Széchenyi Plan (Hungary)
	Cooperation-Clusters (Czech Republic)
	Innovation Clusters Piedmont (Italy)
	Support for the Improvement of International Competitiveness (UR-GE) (Turkey)
	Luxembourg Cluster Initiative
MEDIUM	Vinnväxt (Sweden)
	ARENA (Norway)
	OSKE – Centre of Expertise Program Finland
	Strategic Research Program for Centres of Excellence and Research Clusters (Iceland)
	Regional Growth Agreements (Vaxtarsamningur) (Iceland)
	Competitiveness Poles (Romania)
	Support to integration of enterprises in suppliers' chains or networks (Romania)
	Support to innovative industrial cluster organizations (Slovakia)
LOW	ZIM NEMO – Zentrales Innovationsprogramm Mittelstand - Netzwerkprojekt
NOT AT ALL	–

Table 17 gives an overview of the instruments that are used by the programs to support international activities of clusters:

Table 17: Instruments that are used to support international activities of clusters

		INSTRUMENTS TO SUPPORT INTERNATIONALIZATION ACTIVITIES OF CLUSTERS				
	Name of the program	Training	Funding	Match-making and study trips	Support through export promotion agencies or other offices abroad	Cooperation with other funding initiatives
CZECH REPUBLIC	Cooperation-Clusters		X	X	X	X
DENMARK	Innovation Networks Denmark	X	X	X	X	
ESTONIA	Cluster Development Program	X	X	X		
FINLAND	OSKE – Centre of Expertise Program Finland				X	
GERMANY	Competence Networks Germany	X		X		X
	Cluster Offensive Bayern (Bavarian Cluster Initiative)	X	X	X	X	
	ZIM NEMO – Zentrales Innovationsprogramm Mittelstand - Netzwerkprojekte			X		
HUNGARY	Cluster Development Program of the New Széchenyi Plan		X	X	X	X
ICELAND	Regional Growth Agreements (Vaxtarsamningur) (Iceland)			X	X	

ITALY	Innovation Clusters Piedmont		X	X		X
LATVIA	Cluster Program	X	X	X		
LUXEMBOURG	Luxembourg Cluster Initiative			X	X	X
NORWAY	Norwegian Centres of Expertise	X		X	X	
	ARENA (Norway)				X	
POLAND	Polish Cluster Support	X	X	X		
ROMANIA	Competitiveness Poles, Romania		X	X	X	
	Clusters, Romania		X	X	X	
SLOVAKIA	Support to innovative industrial cluster organizations			X		X
SWEDEN	Vinnväxt (Sweden)	X	X	X	X	X
TURKEY	Support for the Improvement of International Competitiveness (UR-GE)	X	X	X	X	X

N.B.: Not all cluster programs have provided information on the instruments in detail.

Programs that attach high relevance to internationalization activities of clusters typically follow a dedicated strategic international outlook in terms of their program objectives and instruments; although, due to e.g. the short period the program has been existing for now not in all cases this has translated in a huge number of corresponding activities yet. Two examples of program that have attached a high priority on internationalization activities from the very beginning are the Norwegian Centers of Expertise and the Luxembourg Cluster Initiative:

- Based on an international strategy the Norwegian Centers of Expertise program, for example, is directed towards regional clusters with an international growth potential. The focus of support is on adding value to the innovation and internationalization in the business sector. NCE clusters receive regular support with internationalization activities through services provided by the program management agency Innovation Norway.
- Likewise the Luxembourg Cluster Initiative has a dedicated internationalization strategy which includes:
  - o International Networking among the cluster members
  - o Fostering the collaboration with comparable and/or complementary clusters, both regionally and internationally
  - o Participating in international technology fairs and brokerage events
  - o Identifying new business and market opportunities worldwide
  - o Facilitating participation in EU projects.

These two examples reflect a commonality of all programs that attach high relevance to internationalization activities of clusters: the existence of a set of instruments to support international activities. Specific workshops and events are typical, but in some cases programs also make budgets for travel expenses of the cluster management, event organization and consultancy services available.

Innovation Networks Denmark, the Hungarian Cluster Development Program, the Cluster Offensive Bayern and the Polish cluster support are examples of programs that feature such instruments to different extents. In addition to program specific instruments such as workshops the Norwegian Centres of Expertise program and the Cluster Offensive Bayern network their clusters with the foreign trade agencies of their country respectively federal state to support the establishment and development of relationships to international counterparts of the clusters. This approach is also followed by programs that attach medium relevance to internationalization activities such as the Norwegian ARENA program, the Competitiveness Poles of Romania, and the Finnish OSKE program.

The reasons why program officials attach medium relevance to internationalization activities are diverse. In some cases the medium relevance is due to the young age of the program (e.g. Strategic Research Program for Centres of Excellence and Research Clusters and OSKE), but program officials indicated that relevance will increase in the future. In other cases such as ARENA, Vinnväxt the overall objective of the programs is to set up firstly regional clusters respectively to create regional systems of innovation which later then should develop into clusters that are internationally competitive. Also in those cases program officials indicated that internationalization activities are already becoming more important. However, the currently available set of support instruments appears to be smaller and less frequently implemented in contrast to programs that attach high relevance to international activities of clusters.

A similar finding can be stated for the program Innovation Networks Denmark. In the past internationalization activities of clusters have not played an important role in calls for proposals, but in 2010 it was decided by the government that the program should support internationalization through international collaboration projects, increased participation in EU's Seventh Framework Program (FP 7) and other international programs and collaboration with clusters and networks from other countries. This included also the allocation of money for internationalization activities of Innovation Networks clusters. With the establishment of NETMATCH in Denmark in the same year there is now also a dedicated agency in place that supports internationalization activities of program beneficiaries. NETMATCH is also partner in the European Enterprise Network.

The importance of tailor-made internationalization support for clusters through cluster programs is corroborated by the findings of a survey of international activities of clusters. [17] The survey analyzed clusters from different European countries including clusters that are supported in the programs Pôles de Compétitivité, Norwegian Centres of Expertise, ARENA and Vinnväxt. The study confirmed that international activities of cluster managements translate in an increased international visibility of the clusters. The study also highlights that good cluster management can overcome the barriers of internationalization (e.g. lack of financing or capacity); particularly, if an internationalization strategy exists for the cluster and is implemented by the cluster management. By being guided through an internationalization strategy cluster managers are able to implement successful activities for the cluster members. In turn this increases the willingness of companies and other stakeholders such as research institutions or government bodies to engage financially in international cluster activities. The development of international competences of cluster managements and members of the cluster is therefore an important task that should be at the heart of cluster programs if they want to support the internationalization of their clusters. There is a wide set of instruments available, but it is not the financial assistance for projects that matters in the first place, but rather the availability of technical assistance, e.g. in the form of workshops and trainings to support strategy development and competencies such as language or cross-cultural competencies.

The successful internationalization of clusters does not depend only on a professional and capable cluster management and on support from cluster programs. The legal framework of a country, both the home country of the cluster and its "target country", may also create barriers for internationalization. This applies in particular to areas such as tax legislation, labor law, immigration law and company law. Administrative burdens, e.g. in the case of the registration of a company, are also often barriers that are frequently mentioned by cluster managers.

17 Meier zu Köcker, Gerd/Müller, Lysann/Zombori, Zita, 2011: European Clusters Go International. Networks and Clusters as Instruments for the Initiation of International Business Cooperation

2.3.5 PROGRAM OWNERS TAKE OVER A MORE ACTIVE ROLE TOWARDS DEVELOPING INDIVIDUAL CLUSTERS

The majority of the interviewed experts confirmed that individual professional support of cluster managements through tailor-made services has gained more importance in recent years. Many program owners were - as a key element of their strategic approach to cluster development - from the very beginning of the program pro-active in terms of dialogue with clusters, specific criteria for support, provision of best practice and expert consulting. This includes in particular the Swedish program Vinnväxt, the Norwegian programs Norwegian Centres of Expertise and ARENA and the Polish cluster support scheme. In the case of the other programs program owners were also aware of the need of pro-active involvement, but did not put that much emphasize on it because it did not feature that high in terms of the strategy of the program. However, these program owners have become more actively involved in individual cluster development in the recent past respectively they plan to do so. There was no program owner who argued that there is no need for an active role in the development of individual clusters, but some argued that more attention should be paid to this in the context of future program and policy strategies.

The different programs have different sets of instruments available to influence the development of individual clusters:

- Regular meetings with clusters (both joint meetings with all clusters and bilateral meetings between clusters and program owners) and workshops are instruments that are frequently used by most program owners (e.g. Vinnväxt, Norwegian Centres of Expertise and ARENA, Cluster Offensive Bayern and Innovation Networks Denmark).

- In addition to these instruments the Norwegian programs NCE and ARENA also offer specific toolboxes for cluster managers in order to support cluster development. In the context of the Innovation Network Denmark program NETMATCH is currently developing similar toolboxes for cluster managers.

- Prior to the NGPExcellence cluster benchmarking project benchmarking of cluster to facilitate cluster development has been used by only two programs: the Polish cluster support scheme and the terminated initiative Competence Networks Germany.

- Competence Networks Germany also offered a wide array of different working groups and seminars for cluster managers. They cover topics such as sustainable financing, innovation management, quality management, IPR, internationalization, communication and services. In this regard the program Competence Networks Germany was different compared to other cluster programs as it did not provide funding to cluster managements, but only tailor-made services to facilitate individual cluster development. With the establishment of NETMATCH in 2010 the program Innovation Networks Denmark has set up a similar support organization. In France the association "France Clusters" offers similar services to clusters that are supported through the Grappe d'entreprises program, but the services are also available to other clusters.

Several program owners highlighted that cluster managers have to trust the program owners; otherwise the chances of having an influence on the development of individual clusters are limited. Cluster managers have to consider program owners as partners for development and vice versa. The transparent offer of services and the transparent implementation of instruments are important for trust building. The rationale behind a more active, dialogue and guiding role of program owners in individual cluster development can be summarized as follows: cluster support is no longer about the mere establishment of clusters in the first place, but about developing excellent clusters that are internationally competitive and that have an impact on the national economy.

In this regard an active involvement in the development of individual clusters has two principal dimensions:

- First, program owners are interested in improving the management performance of the cluster organization and;

- Second, program owners want to guide clusters in terms of their thematic and strategic focusing.

With regard to the latter cross-fertilization of clusters (bringing together clusters with complementary expertise) is also an important rationale for an increased pro-active role of program owners. However, yet the actual cross-fertilization efforts in the different programs are not based on detailed strategic parameters informed for example through a technological outlook of the program owners. Workshops, networking events and cluster manager forums, regular meetings of clusters with the program agency and in some cases dedicated calls for proposals and small funds (e.g. the French program Grappe d'entreprises, and the Finnish OSKE – Centers of Expertise Program) are typical instruments to facilitate inter-cluster cooperation for the benefit of cross-fertilization.

2.3.6 CLUSTER MANAGEMENT EXCELLENCE HAS BECOME MORE AND MORE IMPORTANT IN RECENT YEARS

Closely related to the interest of program owners in playing a more active role towards developing individual clusters is the increased relevance that is attached by program owners towards cluster management excellence. As already indicated in the previous key finding: Cluster support is not about the mere establishment of clusters in the first place, but about developing excellent clusters that are internationally competitive and that have an impact on the national economy.

Therefore, the majority of program owners argued to focus programs on cluster excellence instead of "numbers of clusters". Only clusters with a high potential of development and high performance should be supported. From the point of view of some program officials this requires at the same time continuous support of the cluster organization to assist them with quality assurance.

In this context program owners play an important role in the development of cluster management excellence as the survey revealed:

- Targeted, need-focused services such as related workshops and seminars, benchmarking as well as a continuous strategic dialogue with cluster organizations to question and further develop strategies and activities are important elements in this regard as most of the interviewed program owners indicated.

- Labeling of excellent cluster organizations was also referred to by several program officials as an instrument to promote cluster management excellence. Several programs are involved in developing such cluster excellence labels and therefore participated in the European Cluster Excellence Initiative to develop a meaningful set of quality indicators and peer-assessment procedures for cluster management. The intention is to develop training materials and to set up an approach for quality labeling of cluster management.[18]

- Financial support of cluster organizations should depend on their performance was often mentioned by program officials. Only excellent clusters should receive financial support and program owners should not hesitate to stop funding if cluster organizations do not live up to the agreed objectives. The Norwegian, Hungarian, Swedish and Danish programs are good examples how this idea can be put into practice: although they commit grant funding for a certain period of years, funding is provided by a series of installments (stage-funding). Prior to installments beneficiaries have to prove through an evaluation that they perform according to the grant agreement (in the Hungarian program a specific accreditation systems decides on further funding). If they do not perform, the program owner is entitled to stop funding.

Thus, the support of cluster management excellence through program owners has two dimensions: on the one hand they should support cluster organizations through the provision of services targeting cluster management excellence and on the other hand they should also execute pressure on cluster managements to motivate them to strive for cluster management excellence.

2.3.7 MONITORING AND EVALUATION IS IMPORTANT, BUT DIFFICULT

Almost all programs have evaluation instruments and processes in place, both with regard to the evaluation of the program itself and the supported cluster initiatives. All program experts consider evaluations as useful tools to improve the governance of a program and its effectiveness and efficiency. In this context many experts consider formative evaluations as more useful than ex-post evaluations as they provide relevant information in the course of the program implementation which can be used for "real-time" improvements of the program. In contrast to this, ex-post evaluations are considered to be of more use while planning a new program or analyzing long-term effects of the support.

The Innovation Network Denmark program and its program authority, the Danish Agency for Science, Technology and Innovation, is a very good example for using annual performance statistics and econometric impact studies for monitoring and evaluation purposes. Since 2006 the annual performance of the clusters that are supported through the program is measured through quantitative data, e.g. indicators on number of new services or products, number of participating companies and research institutions, number

18 For further information on the European Cluster Excellence Initiative please see www.cluster-excellence.eu; for specific information about the cluster management quality label please see www.cluster-excellence.eu/quality.html.

of collaboration projects, usage of services (e.g. matchmaking) offered by the cluster managements, etc.[19] The results of the annual performance assessment is not only used to monitor the program performance from a general angle, but also to identify specific weaknesses of the clusters which are then addressed by targeted measures developed by the program management (e.g. training courses or matchmaking activities). In 2011 the Danish Agency for Science, Technology and Innovation published an impact analysis of the program for the first time. This econometric analysis, which covered 1,225 companies participating in the supported clusters, proved - just to give one example of the results - that the participation of a company in a cluster increases its capacity to innovate significantly within a short period of time (compared to companies that do not participate in a cluster).[20]

While in principle the measurement of outputs and results of a cluster program is not difficult, it is challenging to measure the economic impact of a program. This applies both to the impact of the supported cluster initiatives - e.g. in terms of the cluster's total R&D budget generated by all its members or the number of innovations that are an effect of the cluster initiatives' activities - and the overall impact of the cluster support on the national economy. The challenge of measuring impacts lies in the complexity of the huge array of variables that decide on the actual effect of funding. Economic impacts can be measured e.g. through econometric impact analysis, but one has to be clear about the limitations: First, economic impacts of support programs can be measured only after a certain period of time. Normally the economic impact of activities can be measured after 5-7 years depending on the number of participating enterprises in the cluster with concrete registered activities. In other cases the economic impact using econometric impact analysis must wait longer and very probably sometimes until the program is already terminated. The results can in the latter case be used to verify the economic impact of the program, but not be used to redefine the strategy of the program.

Second, due to the complexity of impact measurement a lot of different information has to be collected from the beneficiaries of the program. As surveys and interviews always require involvement of the beneficiaries in terms of resources one has to balance the cognitive interest in economic impacts of a program with the interest in reducing the burden for the beneficiaries that results from such comprehensive analysis. In this context, Denmark may serve as an international best-practice example for measuring economic impacts of public support by utilizing central civil and business registration systems to collect relevant information for such analysis. Although this reduces the burden for companies and organization involved in the analysis, it cannot fully replace specific surveys and other types of evaluations as those databases do not contain all data in detail that is usually required for the analysis or evaluation of a certain program.

Another best practice example is the policy monitoring system of Lower Austria. The Lower Austrian regional Government, Department for Economy, Tourism and Technology has developed and implemented a system of different monitoring and evaluation tools for Lower Austria's innovation policy to receive an understanding of the results and the impact of state aids and further innovation support services with the aim to improve single innovation policy instruments as well as to coordinate the overall regional innovation system with all involved actors/intermediaries. It combines regional economic reports and analyses by economic research institutes, large scale surveys among companies in the region, evaluation of company projects and last but not least the monitoring of the regional programs implemented by intermediaries based on the Balanced Scorecard method.

Many program officials experienced in the course of the program implementation that there is always room for improvement when it comes to monitoring and evaluation of a program and of cluster initiatives. Although most of them were satisfied with their approach and instruments they indicated that they are in a continuous search for a system that balances the interest in obtaining program governance-related information with the interest in keeping the burdens for beneficiaries that derive from the participation in monitoring and evaluation as low as possible. However, none of them had a text-book-solution for the best system available.

Benchmarking of cluster programs and cluster initiatives was frequently indicated by program officials as a very good tool to support the further development of funding schemes and activities of beneficiaries. Benchmarking provides standards for performance assessment and thus

19 Danish Agency for Science, Technology and Innovation, 2011: Innovation Network Denmark. Performance Accounts 2011, Innovation: Analyse og evaluierung 08/2011

20 Danish Agency for Science, Technology and Innovation, 2011: The Impacts of Cluster Policy in Denmark. An Impact Study on Behavior and Economic Effects of Innovation Network Denmark

helps to identify potential for improvements and best practice through the comparison with peers. Benchmarking is an ideal supplement to a formative evaluation and is less resource intensive than a fully-fledged evaluation exercise. The benchmarking approach of the NGPExcellence project has over the years developed into a widely respected benchmarking standard in Europe.

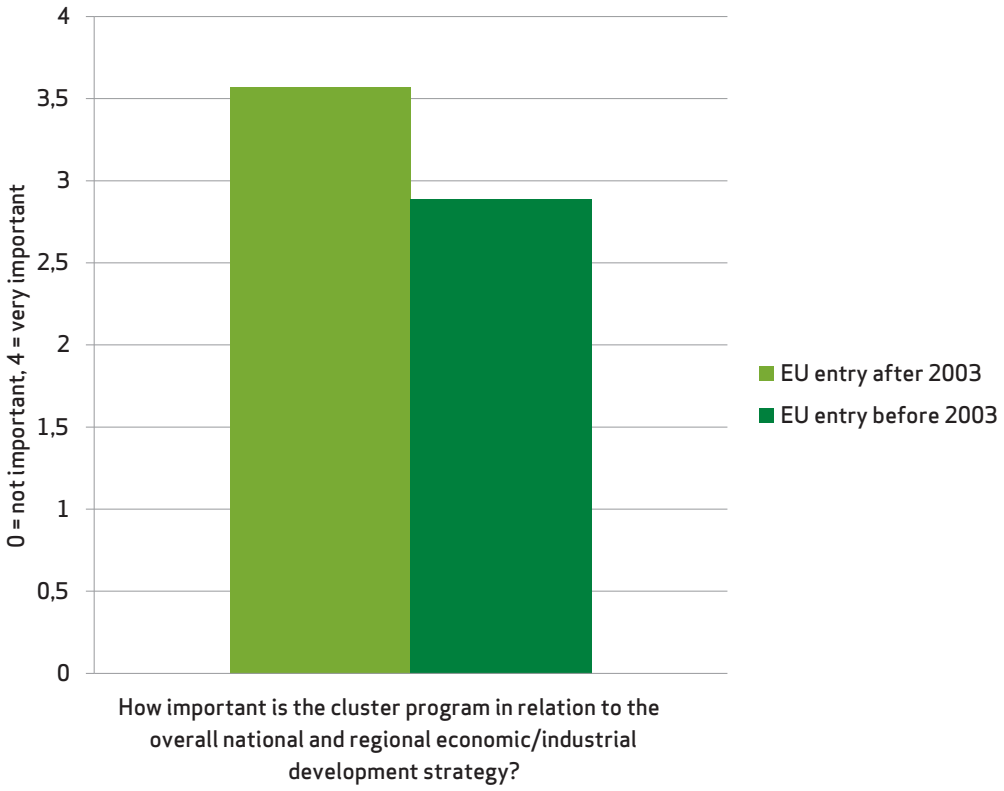
Benchmarking of cluster programs is a very important tool to facilitate cross-border learning in the European Union. Increased collaboration between policy makers on this topic can contribute to the further development of innovation and cluster policies in the European Union and thus contribute to the maintenance and further development of the global competitive position of the European Union and its Member States.

2.3.8 CLUSTER POLICY HAS BECOME MORE IMPORTANT WITH THE EU ENLARGEMENT

When looking at the cluster programs of those countries that have entered the European Union after 2003, it can be stated that for these "younger" EU member countries the importance of the cluster programs has increased within the national and/or regional economic/industrial development strategy in comparison to those countries that joined the EU before 2003. This can be interpreted as a very positive development, as spill-over effects from the "older" EU member states have "inflamed" the new countries' ideas on how to integrate cluster policy in the overall economic strategy. Especially newly started cluster programs, such as the Hungarian cluster program which has been integrated from the beginning in the new overall long-term economic development strategy, the New Széchenyi Plan, can become good practice examples. Also, Lithuania incorporated cluster policy into the regular innovation policy, trying to create a favorable environment for innovative clusters and to develop international clusters. This holistic approach can encourage the members of the clusters and the cluster management organizations as they receive more appreciation for their work.

The figure below compares the importance of cluster programs in relation to the overall national and regional economic/industrial development strategy among those countries that have entered the EU before and after 2003.

Figure 24: Importance of cluster programs in relation to the overall national or regional economic / industrial development strategy

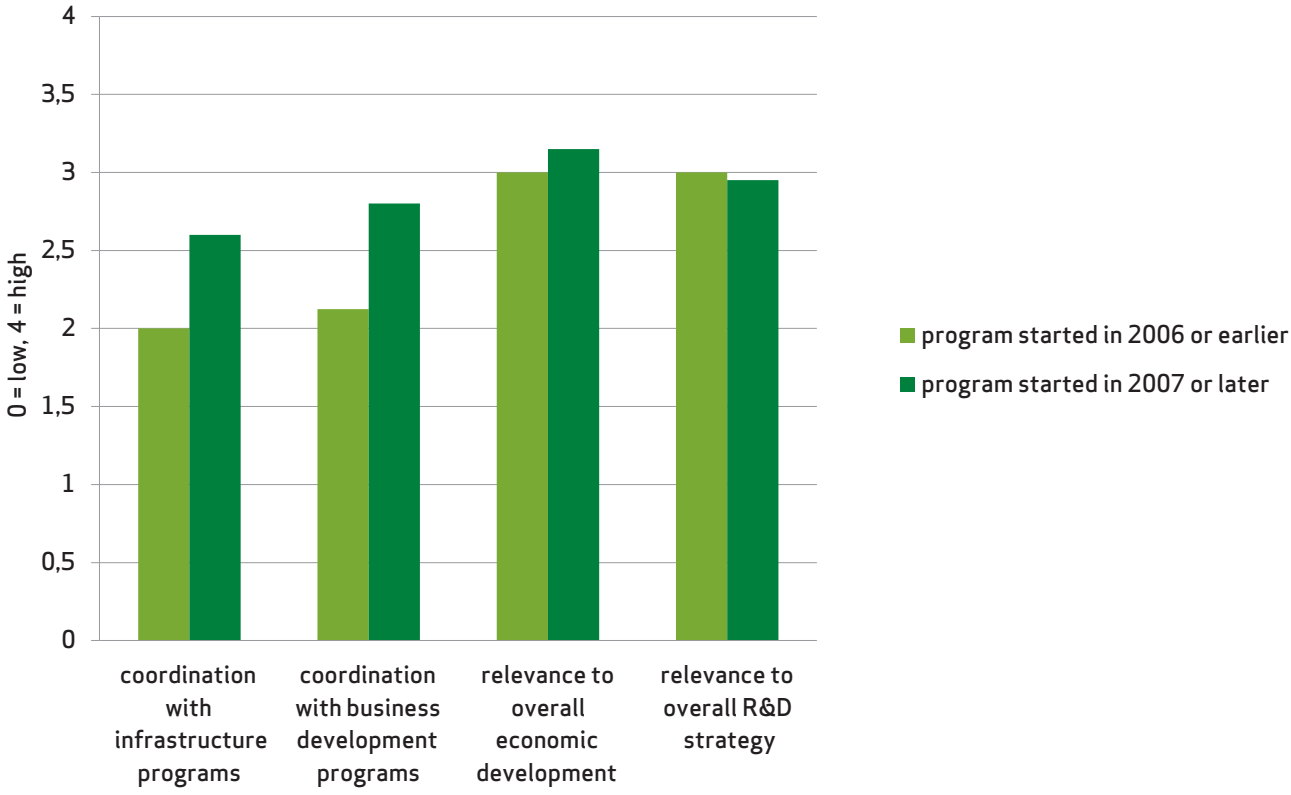


2.3.9 THE EUROPEAN REGIONAL DEVELOPMENT FUND APPROACH HAS LED TO GOOD LINKAGES BETWEEN INNOVATION SUPPORT PROGRAMS AND CLUSTER PROGRAMS

When looking at those cluster programs that have been launched in 2007 or later, it can be said that the coordination with business development programs and with other infrastructure programs of the country is higher as for those cluster programs that have been launched before 2007 (figure 25). This can be reasoned by the fact that within the European Regional Development Fund the support of business networks and clusters is one of the objectives in order to promote regional competitiveness and employment.[21] Many of the cluster programs that have started after 2007 are funded through ERDF and thus follow a highly designated approach with regards to the support of cluster development.

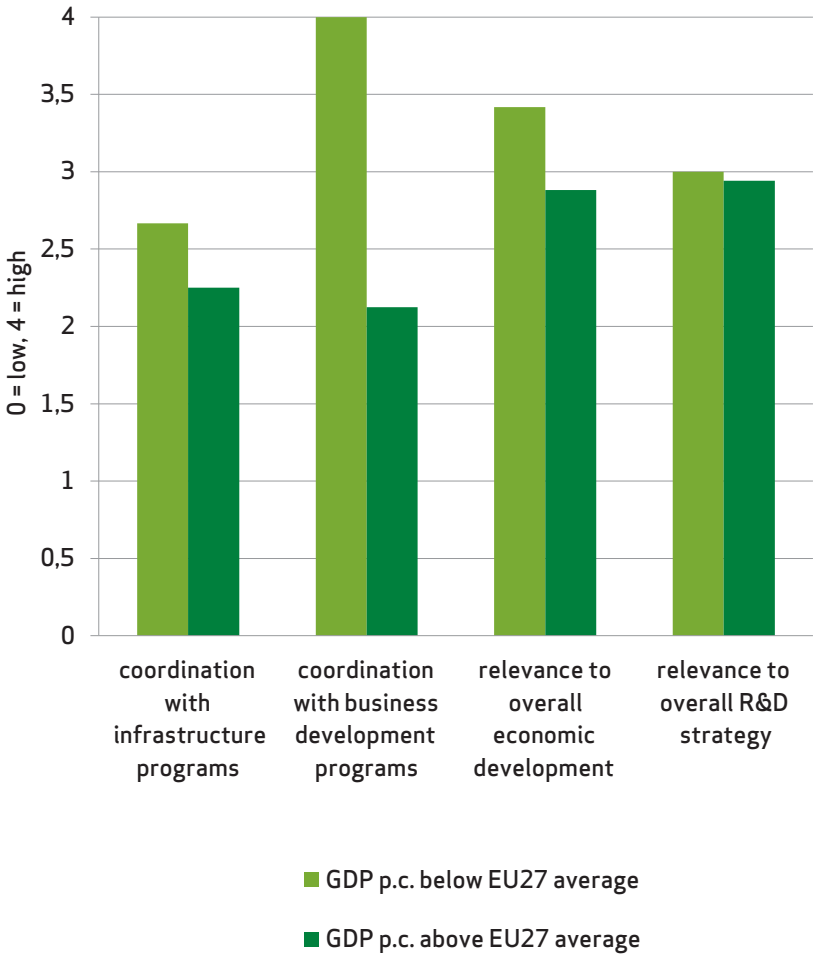
Another interesting result can be found when comparing EU countries below and above EU GDP p.c. average. Taking a look at the GDP p.c. of the countries whose cluster programs have been benchmarked, it appears that those countries that are below the EU GDP p.c. average evaluate their cluster programs as better coordinated with other business development programs and infrastructure programs. This does not mean that these cluster programs are "better", but they are linked more closely to other innovation support measures. Furthermore, these cluster programs rank higher within the overall economic agenda of the respective countries than the cluster programs of those countries above the EU GDP p.c. average.

Figure 25: Comparison of "older" and "younger" cluster programs with regard to the specific economic environment, and R&D strategy as well as other funding programs



21 Official Journal of the European Union (2006). Regulation (EC) No 1080/2006 of the European Parliament and of the Council of July 2006 on the European Regional Development Fund and repealing Regulation (EC) No 1783/1999. (Article 5).

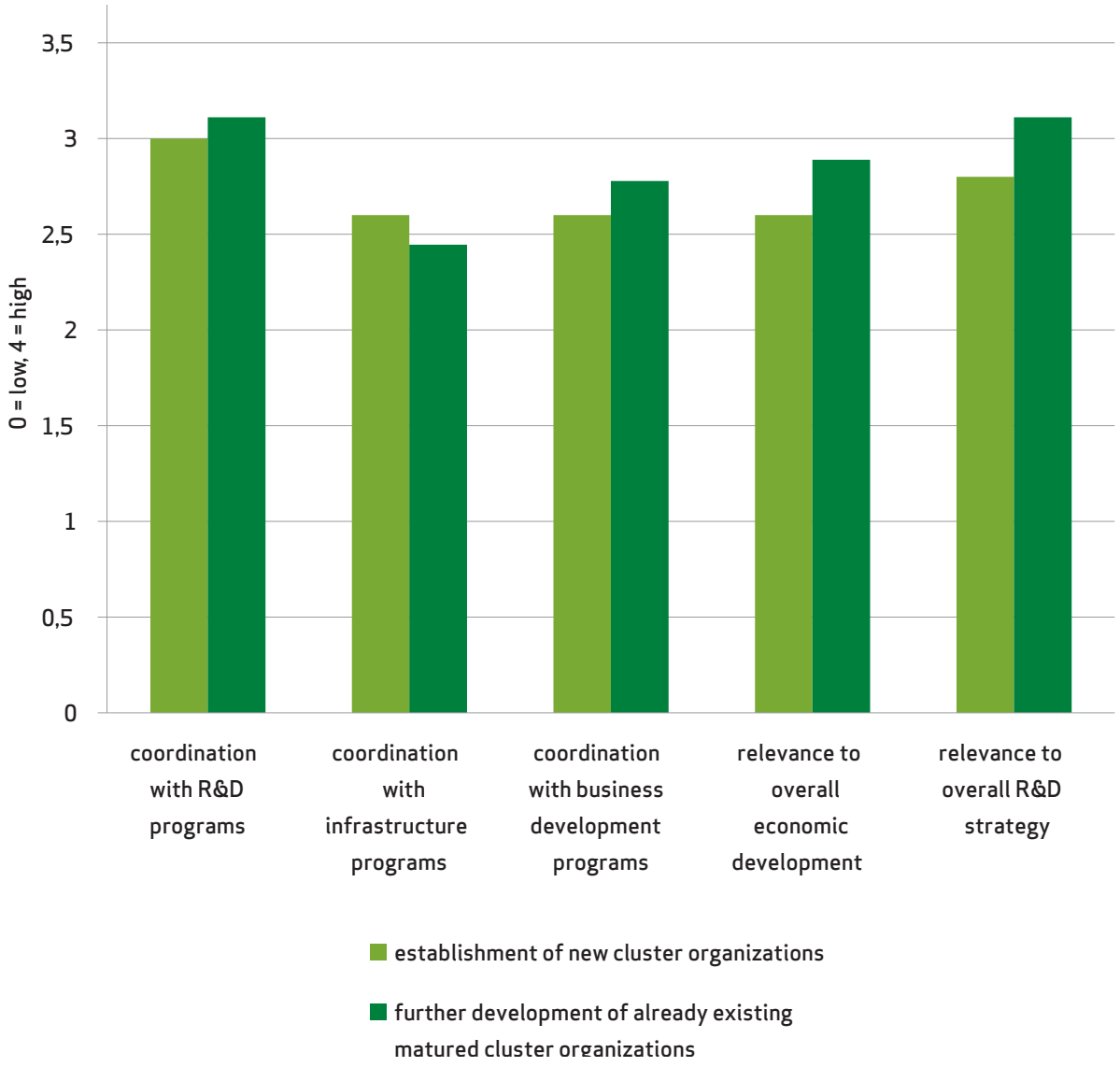
Figure 26: Embedment of cluster programs in the overall economic development and R&D strategy with regard to the GDP of the respective country



2.3.10 INDEPENDENT FROM THE KIND OF SUPPORT THEY PROVIDE THE CLUSTER PROGRAMS ARE EQUALLY INTEGRATED IN NATIONAL POLICIES

Different cluster programs provide different kind of support. Usually, this support is either given through the provision of funding or the supply of technical assistance. Many cluster programs provide both of these support services. Comparing the programs that exclusively provide funding with those that supply technical assistance and funding, it can be stated that in terms of coordination with other funding programs it makes no difference, whether a cluster program focusses on funding only or provides funding and technical assistance to its clusters. Both types of support allow the cluster programs to be coordinated equally strong with other R&D programs, business development programs and infrastructure programs.

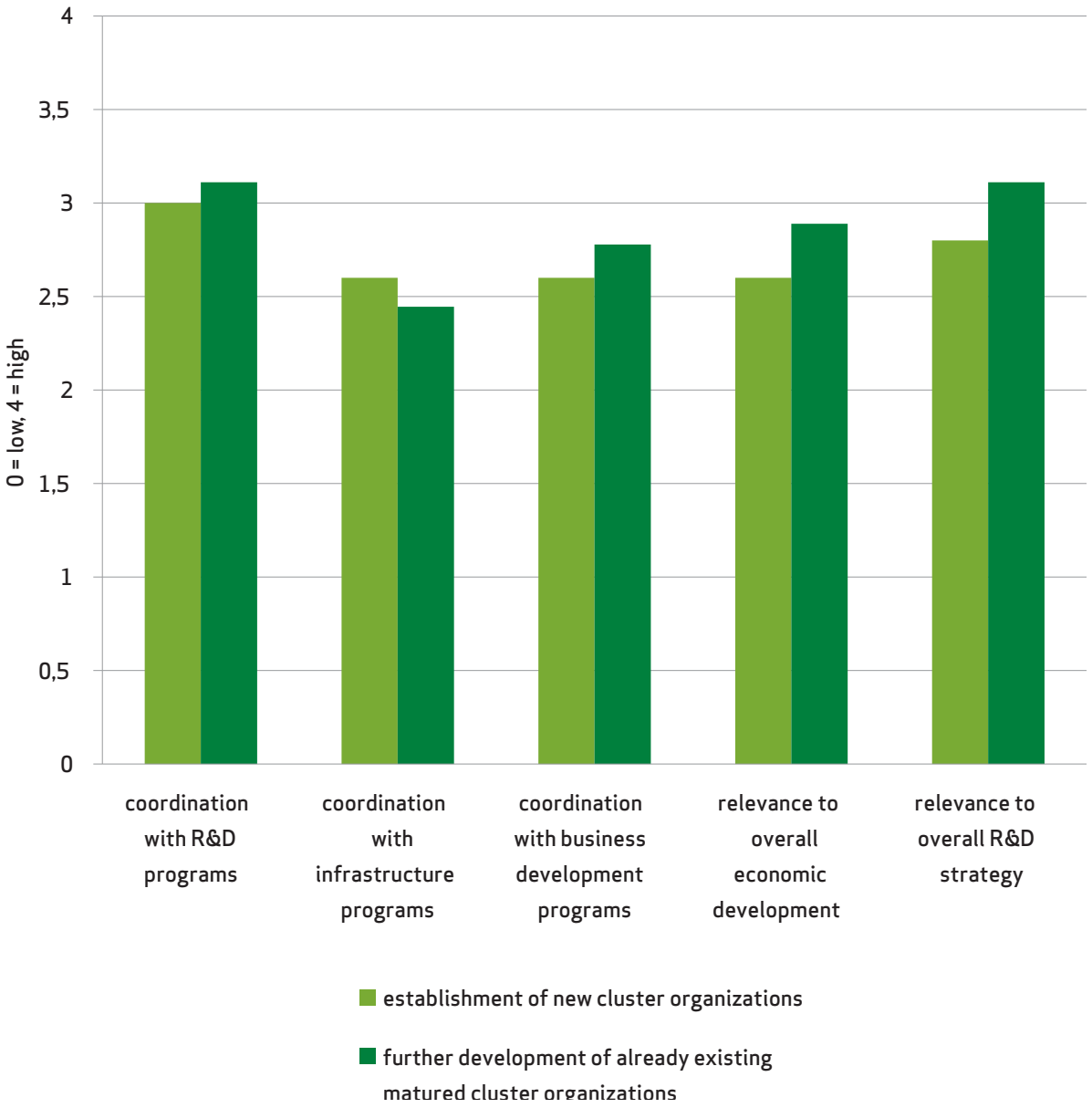
Figure 27: Comparison of cluster programs that provide funding only and cluster programs that provide funding and technical assistance



2.3.11 THE CLUSTER PROGRAMS' STRATEGIC FOCUS OF EITHER LAUNCHING NEW CLUSTERS OR SUPPORTING MATURED ONES TOWARDS EXCELLENCE IS EQUALLY INTEGRATED IN THE POLICY AGENDAS OF THE EU MEMBER STATES

Cluster programs can focus on elevating new clusters or on strengthening matured ones towards excellence, or cluster programs can provide both services. When comparing the cluster programs that focus exclusively on the establishment of new clusters with those that focus exclusively on the further development of matured clusters towards excellence clusters, it can be asserted that both approaches rank high on the respective countries' innovation policy agendas. This is confirmed by the figure below showing only very slight differences between the two groups.

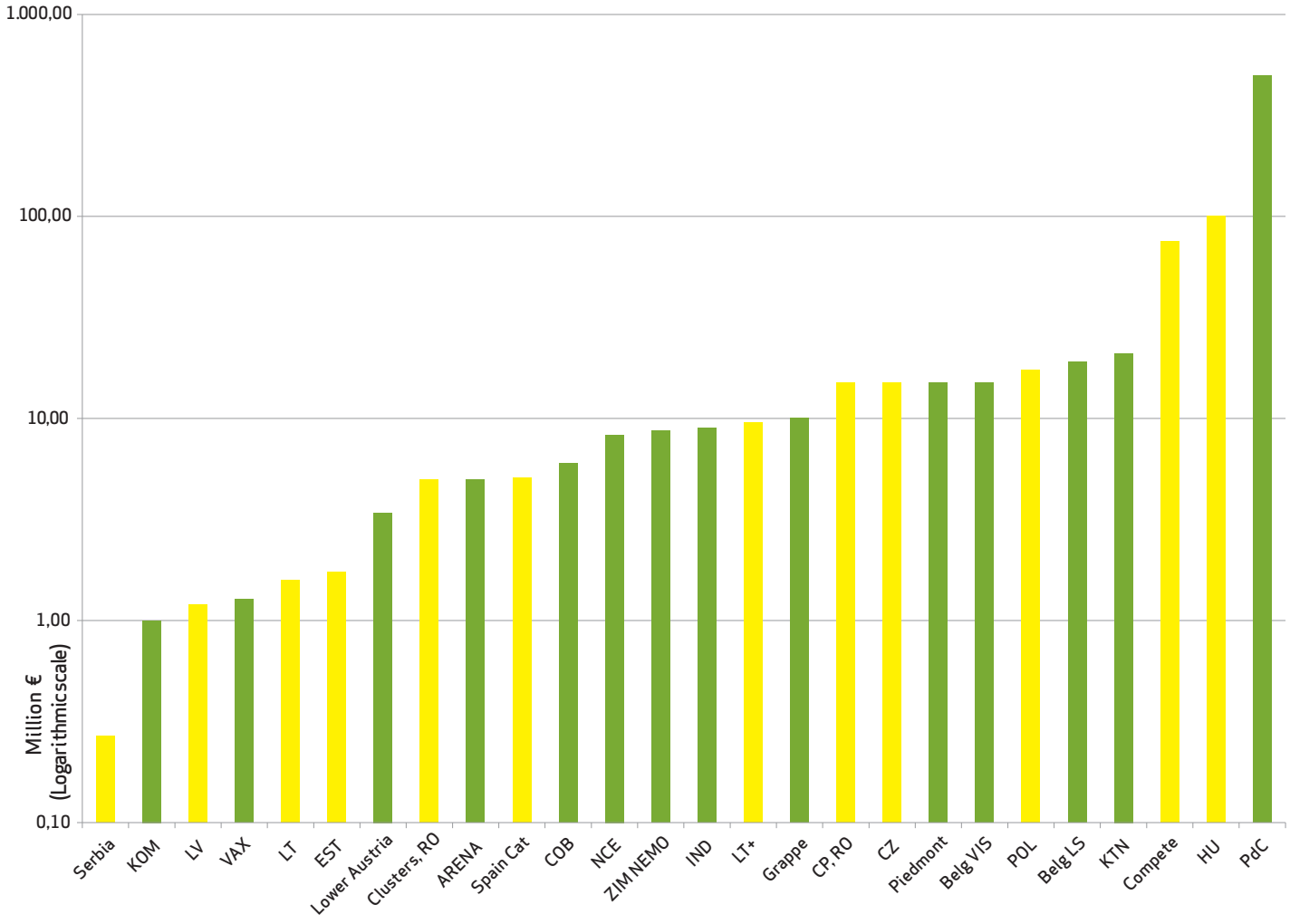
Figure 28: Comparison of cluster programs that focus exclusively on the establishment of new cluster organization and cluster programs that focus exclusively on the further development of already existing cluster organizations



2.3.12 THE BUDGET PROVIDED FOR CLUSTER PROGRAMS IS INDEPENDENT FROM THE GROSS DOMESTIC PRODUCT P.C. OF THE RESPECTIVE COUNTRY

The cluster programs analyzed in this study dispose of at least 1 Million Euros per year (except for Serbia). Most of them have a budget of between 5 and 12 Million Euros per year. Three programs come close or are above 100 Million Euros in their yearly budget. The budget that is spent for the cluster programs is independent from the gross domestic product p.c. of the respective country. The figure below shows that the countries below the EU GDP p.c. average (marked yellow) and the countries above the EU GDP p.c. average (marked green) are equally spread with regard to their yearly budget of the cluster programs. However, comparing the budgets of the different programs is rather difficult as the objectives of the programs are very different from each other, e.g. some of the cluster programs provide extensive budget for R&D investment, others supply budget for the development of cluster management organizations only.

Figure 29: Estimated yearly budget of the cluster programs (in Million €), (Cluster programs of countries below EU GDP average are marked yellow. Cluster programs of countries above EU GDP average are marked green.)[22]



2.4 LESSONS LEARNED AND THE IMPACT ON PROGRAM DEVELOPMENT

Program officials were asked to report the three key lessons that they have learned since the inception of their program. Although lessons learned are always program-specific as the national policy and economic context and the age of the program matter, one can nonetheless identify some general key lessons learned that apply to all programs. Those key lessons learned can be differentiated into key lessons that have been learned in terms of the program strategy (see Table 18) and into key lessons that have been learned in terms of instruments (see Table 19).

22 Please be aware that this figure displays the budget for individual cluster programs only. It does not show the total budget that each country spends for cluster programs.

Table 18: Lessons learned with regard to the program strategy

KEY LESSONS LEARNED WITH REGARD TO THE PROGRAM STRATEGY	
1.	Long-term support is key when clusters should be set up sustainably
2.	The cluster program should be embedded in a regional and/or national cluster policy respectively economic development strategy.
3.	Funding schemes should be flexible in order to be able to adjust support to changing economic environments smoothly and quickly.
4.	Clusters have different characteristics depending on their context (e.g. history of origin, emerging vs. traditional industries). This requires different support mechanisms.
5.	Funding of clusters should depend on their performance.

Table 19: Lessons learned with regard to the instrumentation of the program

KEY LESSONS LEARNED WITH REGARD TO THE INSTRUMENTATION OF THE PROGRAM	
1.	Mutual exchange between cluster managements and networks of cluster managers should be supported through adequate instruments.
2.	Cluster managements should get support for the development of value-adding services that can be offered to the cluster members.
3.	Cluster managements should get support with the development of cluster strategies.
4.	Long-term commitment among the cluster members should be supported.
5.	Internationalization of clusters should be part of the cluster strategy and be supported by the program owner.
6.	Evaluation and monitoring is crucial for the success of the cluster program. Measuring economic and other types of impacts is very difficult, but should be pursued.
7.	Other funding instruments than grants should be also used to support cluster development; e.g. technical assistance or capital investments in organizations.
8.	Quality labeling of cluster organizations should feature as an integral part of cluster programs
9.	The program should activate competition among the clusters benefitting from the program by setting up e.g. annual contests.

The majority of program officials reported in the survey that they have already translated their corresponding lessons learned into adaptations of their programs. This concerned in particular

- The implementation of new support tools and measures;
- An increased attention towards cluster management excellence, e.g. through a more pro-active engagement with cluster managements by means of dialogue or benchmarking exercises;
- Consolidation of the supported "cluster landscape" and reduction of funding rates for cluster managements.

Most cluster programs will continue in the next years without significant changes. In some cases parliamentary elections and ongoing or upcoming elections may have an impact on the program configuration.

3 POLICY RECOMMENDATIONS

Clusters are individuals who need individual support for sustainable growth and enhanced competitiveness in order to become world-class clusters that maintain and extend the global competitiveness of the European Union's economy – that is the most important conclusion from the benchmarking of 261 cluster management organizations.

Support of cluster development by means of cluster programs should therefore be more than just providing grants for office and staff funding of cluster management organizations. It is also about providing tailor-made technical assistance for cluster management organizations in order to support their efforts with the provision of needs-driven and value-adding products and services for the cluster members. And it is also about developing favourable frame-work conditions in which clusters can flourish through the coordination of cluster policies and programs with other relevant policy areas and programs. Last, but not least: cluster programs should focus on the support of cluster management excellence. Only cluster management organizations that are excellently managed can develop and offer the support to cluster members that they need to maintain and extend their global competitiveness.

The results of the benchmarking of 34 cluster programs from 24 countries, which are Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Italy, Latvia, Lithuania, Luxembourg, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Spain, Sweden, Turkey and United Kingdom demonstrate that there are many good cluster programs not only in the European Union Member States but also in Associated States. All these programs support the above briefly sketched objectives forward looking cluster programs should have. However, there is always room for improvement. In order to improve their effectiveness and efficiency these programs can both learn from each other from the results cluster program benchmarking and from the results of the cluster benchmarking. Certainly, these results provide also inspiration for many other cluster programs that have not participated in the NGPExcellence project.

In the following seven policy recommendations are presented that are based on the findings of the cluster and cluster program benchmarking. They provide guidance for the further development of cluster programs and shall contribute to the evolution of outstanding clusters that are driven by excellent cluster management organizations:

1. **Improve coordination of cluster programs and other relevant funding programs. Ideally there should be only a limited number of coordinated cluster support programs** that target different types of clusters. With a limited number of cluster support programs that support the establishment of cluster management organizations at the core of an overall cluster development strategy additional individual R&D/innovation, business development and infrastructure (e.g. in the educational sector) programs can address the specific needs of the different actors within a cluster. In this regard program strategies, instruments, time frames and target groups of programs should be coordinated and efforts should be made to limit administrative burdens for applicants as much as possible. Programs should also be aligned with policies that pursue an improvement of the framework conditions which have an impact on the development of a cluster (e.g. educational or labour policies).

2. **Tailor-made assistance for clusters should have a high relevance in the program strategy.** The economic impact of a cluster depends not only on its size and maturity. It is also the technology domain of the cluster that matters in terms of the structure, the governance and the performance of a cluster. Cluster programs therefore should take the different frame-work conditions of industries and technology domains into account through assistance that is tailor-made according to the specific needs of a cluster.

3. **Programs should put emphasis on cluster management excellence.** Cluster support is not about the mere establishment of clusters, but about developing excellently managed clusters that are internationally competitive and that have an impact on the national economy. In this context is it important to support cluster management through targeted, need-focussed services such as relevant workshops and seminars, benchmarking as well as a continuous strategic dialogue to question and further develop strategies and activities. Labelling of excellent cluster managements is another important aspect in this context; not only because it creates more visibility for a cluster, but also because it encourages cluster managements to provide excellent management in order to earn and preserve the label.

4. **Cluster programs should develop world-class clusters in industry sectors that are internationally competitive**. Without limiting the attention to the development of clusters for the purpose of regional economic development, there should also be programs that support

the development of clusters that are internationally competitive. The support should focus on those industries in which a country's economy shows pronounced comparative advantages on the global market. Cluster management excellence should be a key priority of such programs.

5. **Long-term, but flexible support of clusters is required.** In order to meet the specific development conditions of clusters support should be provided on a long-term basis of five to ten years. Furthermore, program requirements and processes should not only be less bureaucratic, but also flexible enough to respond quickly to changing economic and technology environments in which clusters are operating in.

6. **Monitoring and evaluation of the results and impacts of a program is important and should be done in a smart and purposeful manner**. From the very beginning the program should be based on clear targets that can be measured through a purposeful set of indicators that provides information relevant to the implementation processes. The implementation of a program should be accompanied by a formative evaluation which provides recommendations for program adaptation on a continuous basis. It is important that there is a balance between the cognitive interest of program owners and policy makers and the burdens for beneficiaries that result from monitoring and evaluation.

7. **Different industry sectors need different support for internationalization activities.** There are huge differences between industry sectors when it comes to the effect of the work of cluster managements on international activities of SME. The promotion of cluster management activities for internationalising the cluster should therefore take the specific framework conditions of industry sectors into account. Corresponding instruments should be developed by program owners to provide need-based support for cluster managements.

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