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Clusters Are Individuals

Creating Economic Growth through Cluster Policies
for Cluster Management Excellence



Thomas Lämmer-Gamp
Gerd Meier zu Köcker
Thomas Alslev Christensen

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VDI/VDE Innovation + Technik GmbH (VDI/VDE-IT)

Steinplatz 1,
10623 Berlin/Germany
www.vdivde-it.de

Dr. Gerd Meier zu Köcker

Head of Department „International Technology Cooperation and Clusters“,
mzk@vdivde-it.de

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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 140 cluster organisations and of cluster policies from nine 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 organisations 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 etc.

The Danish Ministry of Science, Technology and Innovation, supported by the German Federal Ministry of Economics and Technology and its national cluster program “Initiative Kompetenznetze Deutschland” (Competence Networks Germany), the Nordic Council of Ministers and Nordic Innovation (NICe), has initiated the project „**NGPExcellence – Cluster Excellence in the Nordic Countries, Germany and Poland**“. Further partners were VINNOVA (Sweden), Tillväxtverket (Sweden), the Finnish Funding Agency for Technology and Innovation (TEKES), the Finnish Ministry of Employment and the Economy, Innovation Norway, the Icelandic Centre for Research (RAN-NIS), Innovation Centre Iceland, the Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology (Germany) and the Polish Agency for Enterprise Development (PARP).

The overall objective is to contribute to the development of outstanding clusters through excellent management and excellent cluster programs. Conducted from October 2010 to July 2011 the project pays particular attention on the characteristics of cluster management organizations and their effects on cluster development. More than 140 cluster management organizations from eight countries were benchmarked to base the analysis on a comprehensive comparative portfolio. 16 cluster programs from nine countries supporting most of the analyzed cluster organisations 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 analyses has provided a comprehensive set of information and new knowledge about the characteristics of cluster management organizations and clusters in terms of age, size, composition of membership, regional concentration and financing. The key findings of the comprehensive benchmarking analyses of cluster management organizations include:

- Research-driven clusters are much more similar to industry-clusters than previous research suggested;
- Clusters with a small or high share of public funding are similar in terms of structure and governance, but different in terms of impact;
- The visibility and attractiveness of a cluster and the impact of the cluster management organization on SME development depends its age and size; apparently, larger and matured clusters

provide a much better environment for results and impacts through activities of a cluster management organization;

- The structural characteristics of a cluster in terms of e.g. size, governance structure or degree of specialization as well as the impact of the work of a cluster management organization depend on the technology it is operating in;
- Clusters with a high impact on business activities of SME feature an active cluster management organization in terms of spectrum and frequency of business-related services.

The results 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 SME. Structural factors such as size, age, governance and the share of private funding in the total budget of the cluster management organization as well as 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.

The benchmarking of 16 cluster programs provides new knowledge and detailed insights into program characteristics in terms objectives, strategic focus, instruments, target groups, evaluation methods, terms and financial aspects. The key findings of the analysis are:

- Different types of cluster programs service different purposes: regional economic development, development of national industries, commercial exploitation of R&D results and promotion of networking are general categories cluster programs can be grouped in;
- Most cluster programs feature high on the government's agenda;
- Coordination of cluster programs with other public support programs shows room for improvement;
- Internationalization of clusters is considered to be important, but the relevance of supporting internationalization of clusters varies between the different programs;
- Program owners take over a more pro-active role towards developing individual clusters;
- Cluster Management Excellence has become more and more important in recent years;
- Monitoring and evaluation is important. Assessment of the impact on business is difficult, but not impossible. International best practice is presented.

The report presents lessons learned by program owners and a unique detailed overview of 16 European cluster programs. Finally, the main elements of a perfect cluster program with regard to its overall strategic set up, target group, instruments and implementation is introduced.

The report provides eight policy recommendations with guidance for future developments of cluster programs. The recommendations shall contribute to the evolution of outstanding "world class" clusters that are driven by excellent cluster management organizations:

1. Improve coordination of cluster programs and other relevant funding programs;
2. Tailor-made assistance for clusters should have a high relevance in the program strategy;
3. Programs should put emphasis on cluster management excellence;
4. Cluster programs should develop world-class clusters in industry sectors that are internationally competitive;
5. Long-term, but flexible support of clusters is required;
6. Monitoring and evaluation of the results and impacts of a program is important and should be done in a smart and purposeful manner;
7. Technical assistance instruments are important for the promotion of international activities of clusters;
8. Different industry sectors need different support for internationalization activities.

1 Introduction

In economic and innovation policy the term „cluster“ is usually used to explain geographical concentrations of economic and innovation activities. According to Michael E. Porter “clusters are geographic concentrations of interconnected companies and institutions in a particular field”¹ that collaborate and compete at the same time. According to this conventional wisdom clusters support economic development through the specialization of regions in activities within which companies can gain higher productivity through accessing external economies of scale or other comparative advantages.²

Throughout the past 15 years clusters have gained more and more importance as an element of economic development and innovation strategies of the European Union and its Member States. Owing to dedicated cluster policies of Member States, particularly since the end of the 1990s, an increasing number of business initiatives or top-class universities and research institutes have been instrumental in the emergence of strong clusters by acting as a catalyst and helping to unleash the economic and scientific potential of particular regions. However, the development of corresponding policies is still an early stage, but it has gained momentum.³ The European Union highlights the relevance of clusters for maintaining and further developing the global competitiveness of the European economy. In 2006 the EU adopted its broad-based innovation strategy and identified clusters as one of the nine strategic priorities for successfully promoting innovation.⁴

The analyses in this report challenge the conventional wisdom of what drives economic development and innovation activities within a cluster. Based on the largest international analysis of its kind involving a simultaneous benchmarking of more than 140 cluster organisations and of cluster policies from nine European countries it is found that the economic impacts of clusters depend on many factors not related to the specialization of regions through the geographical concentration of the cluster. 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 organisations and cluster policies also show many other determinants for the development and characteristics of a cluster.

In the absence of a widely accepted definition of cluster policy Christian Ketels defines cluster policy as all efforts by governments, alone or in collaboration with companies, universities and others that are aimed at enhancing the competitiveness of clusters.⁵ This broad definition goes beyond cluster funding programs and includes also policy measures from other areas, such as tax and labor policies. Cluster policy has to be understood, planned and implemented as a structural policy that changes the behavior of companies and institutions. In this respect there are two opposing academic understandings of cluster policy: One approach sees geographic concentrations as the key policy lever. In this understanding increased competitiveness will follow the geographic

¹ Michael E. Porter, 1998: Clusters and the New Economics of Competition, in: Harvard Business Review, November 1998, p. 78

² OECD, 2009: Clusters, Innovation and Entrepreneurship, p. 26

³ Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: Towards world-class clusters in the European Union: Implementing the broad-based innovation strategy, COM (2008) 652 of 17.10.2008, <http://ec.europa.eu/enterprise/policies/innovation/policy/clusters/>, p. 3

⁴ Ibid., p. 2

⁵ Christian Ketels, 2010: Cluster Policy: A Guide to the State of the Debate, in: Knowledge and Economy, Springer Publishing, forthcoming

concentration of relevant actors. Policy interventions should therefore be focused on making a region attractive for companies, e.g. through tax rebates or free infrastructure. Another approach sees competitiveness as the key policy lever. In this understanding increased competitiveness will result in the geographic concentration of relevant actors as the cluster becomes more attractive for new stakeholders. Policy interventions should therefore be targeted on geographic concentrations that have already passed the early stages of development. As in these environments the fundamental conditions for economic success are in place, collaboration between relevant stakeholders should be supported through policy interventions, e.g. funding.⁶

In order to facilitate the discussion about cluster policy through further insights into the characteristics of clusters and cluster policy intervention, the Danish Ministry of Science, Technology and Innovation, supported by the German Federal Ministry of Economics and Technology and its national cluster program “Initiative Kompetenznetze Deutschland”, the Nordic Council of Ministers and the Nordic Innovation Centre (NICe), has initiated the project „NGPExcellence – Cluster Excellence in the Nordic Countries, Germany and Poland“. The overall objective of this project is to contribute to the development of outstanding clusters through excellent management and excellent cluster programs.

Further partners in this project were VINNOVA (Sweden), Tillväxtverket (Sweden), the Finnish Funding Agency for Technology and Innovation (TEKES), the Finnish Ministry of Employment and the Economy, Innovation Norway, the Icelandic Centre for Research (RANNIS), Innovation Centre Iceland, the Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology (Germany) and the Polish Agency for Enterprise Development (PARP).

The objective of this project is aligned with the work of the European Cluster Policy Group that was formed by the European Commission in October 2008. The European Cluster Policy Group consisted of 22 independent experts who were tasked to improve the Commission’s and Member States’ understanding of modern policy responses in support of cluster excellence and to make recommendations on how to better design cluster policies in the Community.⁷

This project pays particular attention on the characteristics of cluster management organizations and their effects on cluster development. More than 140 cluster management organizations from nine European countries were benchmarked to base the analysis on a comprehensive comparative portfolio. As many cluster management organizations are supported through national funding programs the project also analyzed 16 cluster programs from nine countries in a benchmarking exercise to facilitate a better understanding of successful strategies and mutual learning between the program owners.

The project, which started in September 2010 and ended in July 2011, addressed two target groups: On the one hand, managers and staff of the cluster and network organizations from the participating countries, and on the other hand, program owners and policy makers responsible for national cluster and network programs and policies. Benefits are new insights and findings that can promote cluster management excellence and the development of quality of cluster and network services for enterprises. Furthermore, the project provides new insights, findings and best practice that can improve the quality of the national cluster and network programs and policy initiatives.

⁶ Ibid.

⁷ Commissions Decision of 22 October 2008 setting up a European Cluster Policy Group (2008/824/EC). For further details on the European Cluster Policy Group see www.proinno-europe.eu/ECPG



NGP Cluster Excellence Conference in May 2011

The findings of the project were presented at the NGP Cluster Excellence Conference on May 26th and 27th, 2011 in Copenhagen. More than 450 participants from 27 countries participated in this event and discussed the results of the project as well as many other cluster-related topics in numerous workshops.

For the conference and workshop documentation please see www.clusterexcellence.org.

Clusters (which are sometimes also referred to as regional networks) are, as already indicated, geographic concentrations of interconnected companies and institutions in a particular field. Both innovation and economic development policy makers consider them as instruments to raise innovation and productivity in numerous ways. Companies and research actors benefit from sharing knowledge about best practices and reduce costs by jointly sourcing services, suppliers and knowledge; increased interaction facilitates innovation. Frequent interactions facilitate formal and informal knowledge transfer and promote efficient and effective collaboration between institutions with complementary assets and skills. Once a cluster has gained a certain critical mass it attracts further companies, investors, services and suppliers as well as skilled labor forces.

In both developed countries and emerging economies enormous efforts and investments have been made in the past two decades to promote economic growth and competitiveness through the development of clusters. In many cases impressive progress has been achieved, although structures, objectives and framework conditions of clusters as well as level and nature of collaboration between the cluster stakeholders differ considerably. Although yet not counted in detail, nowadays several thousand clusters or would-be clusters seem to exist in Europe.

Whereas in the past considerable efforts have been made in many European countries to set up clusters, today policy makers and cluster stakeholder have to tackle the challenge that clusters become and remain competitive in a globalized economy. Only excellent clusters that can compete and grow in the global economic environment can meet the expectations from policy makers and cluster stakeholders. In other words: cluster excellence matters. It contributes to more prosperity for regions, better competitiveness for companies and more return of investment for investors. Cluster excellence also matters when seeking more value for money for research and innovation public support. Excellence is needed at different levels, including the levels of cluster policies, cluster programs and cluster management organizations.

There is an emerging consensus that cluster excellence can support the development of so-called world-class clusters.⁸ The hypothesis is that enterprises benefit from favorable “eco-systems” that foster competition as well as collaboration – thus providing gateways to knowledge, finance and markets. This concept can be built around three dimensions of a cluster. It has become common sense that these three dimensions are of high importance for cluster development and have to be addressed by (cluster) policy intervention (see Figure 1):

⁸ See e.g. the Europa InterCluster White paper on “The emerging of European world-class clusters” at www.intercluster.eu/images/stories/white_paper/white_paper_the_emerging_of_european_world_class_clusters.pdf

- **The dimension of framework conditions:** In a competitive environment clusters need to develop within favorable framework conditions to support the activities of cluster companies. There are general framework conditions that are important for all clusters. Examples of such include specific infrastructures, labor force skills or institutions, but also regulatory issues such as work migration or taxation. Stability-oriented macroeconomic reforms and structural reforms are also important elements of favorable framework conditions.
- **The dimension of cluster actors:** Within a cluster there have to be strong companies and strong interaction between the actors that constitute the cluster. This strength is a combination of critical mass of companies in a given geographical space, individual company characteristics and behavior and the dynamics of interactions and cooperation between companies and other relevant stakeholders such as research institutions and universities.
- **The dimension of the cluster management organization:** The quality of cluster management is critical to support strong dynamics among companies and other relevant stakeholders of the cluster.

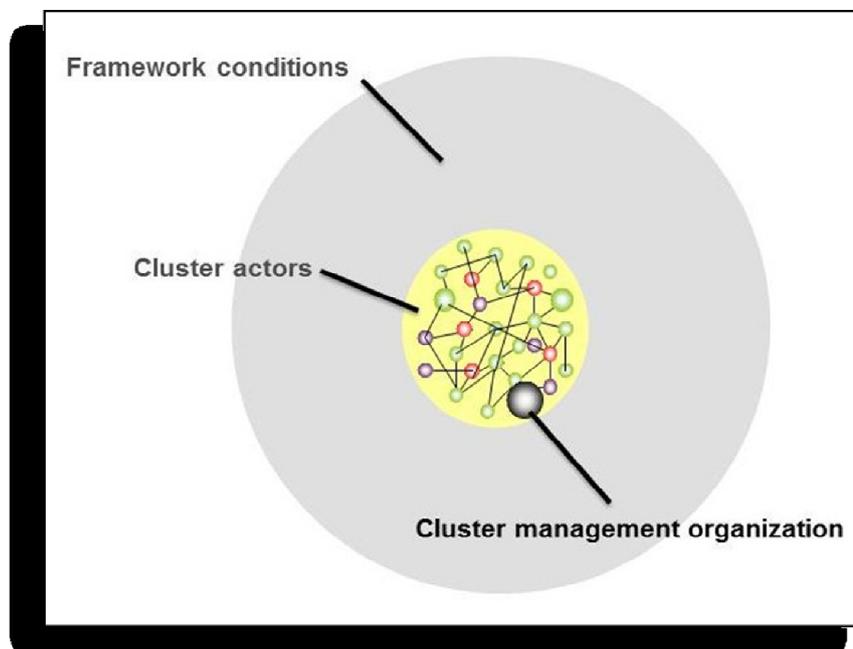


Figure 1: The nutshell model of cluster intervention (VDI/VDE-IT 2010)

These three dimensions of “world-class clusters” reflect a wider concept that aims at capturing the conditions that are conducive for the development of global competitive advantages. As a consequence, the European Commission, among others, has called for the creation of more world class clusters. Although this demand sounds very logical, it is no easily turned into practice. For public authorities involved in cluster policy issues as well as for cluster practitioners, this would mean a considerable change of paradigm which may have a significant impact on future support of clusters. The need to promote cluster excellence has gained a lot of attention, political acceptance and widespread support from stakeholders in the context of the implementation of the EU’s “broad-based innovation strategy”.⁹ Most importantly, the recent Europe 2020 Strategy explicitly mentions

⁹ The Council of the European Union: Conclusions on the Commission communication "Towards world-class clusters in the European Union: implementing the broad-based innovation strategy", December 2008, http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/intm/104407.pdf or Presidency Con-

clusters under the flagship initiative “An industrial policy for the globalization era” as important elements to improve the business environment, especially for SMEs.¹⁰ This suggests that cluster policies should not only be seen as a powerful policy instrument to promote innovation, but also as an integral part of industrial policy that aims at preparing Europe for global competition. This aspect is also reflected in the final report and policy recommendations of the high-level European Cluster Policy Group.¹¹

1.2 Focus of the Report: Excellence of Cluster Management Organizations and its Promotion of Cluster Programs

This report deals mainly with the third dimension of a cluster, the cluster management organization, and its interaction with the second dimension, the cluster actors. This dimension has been underestimated over years as Porter’s cluster approach did not regard this success factor for different reasons. Many of the cluster programs in Europe focus on the establishment and development of cluster management organizations. Clear evidence has evolved in the past couple of years that cluster management excellence plays a decisive role for the successful development of clusters.

In the context of the “world-class cluster” concept, cluster management excellence depends on

- The existence and implementation of a strategy for the further development of the cluster;
- The provision of professional services that address the needs of the cluster members through the cluster management;
- Sustainable financing of the cluster management organization and appropriate staffing of the organization;
- Additionality.

In order to provide further insight into cluster management excellence and the opportunities of its promotion through cluster programs this report presents the results of the benchmarking

- Of more than 140 cluster management organizations in Denmark, Finland, Germany, Iceland, Norway, Poland, Sweden and Austria in terms of their status of development and activities;
- Of 16 cluster programs from Denmark, Finland, France, Germany, Greece, Iceland, Norway, Poland and Sweden programs in terms of their strategies, objectives and instruments.

Cluster management organizations were selected for benchmarking if they were or are supported by a national cluster program whose program agency was a partner of the NGPExcellence project.¹² Participation was voluntarily. The selection of cluster programs was based either on the participation of the corresponding program agency in the NGPExcellence project consortium or on voluntary expressions of interests from program agencies.

clusions of the Brussels European Council (13/14 March 2008), http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/99410.pdf

¹⁰ Communication from the Commission: Europe 2020. A strategy for smart, sustainable and inclusive growth, COM (2010) 2020 final, http://ec.europa.eu/eu2020/index_en.htm

¹¹ European Cluster Policy Group, 2010: Final Recommendations – A Call for Policy Actions and European Policy Group, 2010: Consolidated Set of Policy Recommendations on Four Themes, reports are available at www.proinno-europe.eu/ecpg/newsroom/ecpg-final-recommendations

¹² One Austrian cluster has participated in the benchmarking, although it is not supported by one of the cluster programs that were part of the NGPExcellence project consortium. This cluster participated to test the interview guideline in the preparation phase of the project.

The data was collected through individual benchmarking interviews with cluster managers and program owners from the participating countries. In addition to this report each cluster has received an individual report analyzing its individual strengths and weakness. These reports, which are confidential and only made available to the cluster management organization, also give individual recommendations for improvement.

1.3 Methodology

Benchmarking is a comparative analysis of structures, processes, products and services. It compares an entity to peers that are active in the same area and/or best practices from entities in other areas (comparative portfolio). Peers and other suited entities can be compared with each other if they share similarities. The objective of benchmarking is to learn from better performing peers or other entities in order to improve its own structures, processes, products and services. Although benchmarking identifies best-performing entities (the benchmark) it is neither a tool for rankings nor can it substitute evaluations. Benchmarking is a widely accepted methodology that provides the opportunity for mutual learning through the comparison of quantitative indicators.

Benchmarking relies on information provided by the interviewee to an external benchmarking expert. The expert does not have any detailed justification or proof of the received information available. Therefore, interviewees are expected to provide correct answers. Benchmarking is a self-assessment and therefore cannot be compared with an evaluation. Furthermore, benchmarking does not qualify for any rankings and does not give any information whether specific characteristics of cluster management organizations or cluster programs can be considered as good or poor.

The methodology of this particular benchmarking exercise has been developed by the Agency Kompetenznetze Germany (Competence Networks Germany), which is hosted by VDI/VDE Innovation + Technik GmbH. The methodology for cluster benchmarking incorporated also new insights and developments from the European Cluster Excellence Initiative (www.cluster-excellence.eu, a project funded by DG Enterprise and Industry of the European Commission).

Data for the benchmarking of cluster management organizations was collected in structured face-to-face interviews with cluster managers at their premises. The interviews were conducted either by experts of VDI/VDE Innovation + Technik GmbH or by experts from project partners in collaboration with VDI/VDE Innovation + Technik GmbH. A standardized procedure of data analysis ensures comparability of results and allows drawing conclusions on an aggregated level.

The benchmarking of cluster management organizations focused on five different dimensions covering 34 indicators (see Table 1). Cluster management organizations were benchmarked both with their peers from the same technology field and with the complete comparative portfolio. The collected data can be used to describe and analyze a cluster in terms of its structure, management and governance, financial aspects, services that are offered by the cluster management as well as in terms of the achievements and recognition of the cluster management organization respectively the cluster.

Dimensions	Indicators
Structure of the cluster	Age of the cluster organization
	Legal form of the cluster organization
	Nature of the cluster: driving forces
	Nature of the cluster: degree of specialization
	Composition of the cluster membership (Committed members)
	Regional concentration of the cluster members (Committed members)
	Utilization of regional growth potential
	International members of the cluster
	Nature of cooperation between cluster members
Cluster management and governance/Strategy of the cluster organization	Assignment of tasks/clarity of role definitions of the cluster management and the cluster members
	Number of cluster members per employee (full-time equivalents) of the cluster organization
	Human resource competences and development in the cluster organization
	Strategic planning and implementation processes
	Thematic and geographical priorities of the cluster strategy
Financing of the cluster management	Current sources of financing of the cluster organization
	Share of private financing of the cluster organization in relation to the age of the cluster
	Financial sustainability of the cluster organization
Services provided by the cluster organization (Spectrum and intensity)	Acquisition of third party funding
	Collaborative technology development, technology transfer or R&D without third party funding
	Information, matchmaking and exchange of experience among members
	Development of human resources
	Development of entrepreneurship
	Matchmaking and networking with external partners/promotion of cluster location
	Internationalization of cluster members
Achievements and recognition of the cluster organization	Intensity of external requests for cooperation
	Origin of external cooperation requests
	Geographical dimension of the external cooperation requests
	Characteristics of cooperation with foreign clusters
	Media appearances
	Impact of the work of the cluster organization on R&D activities of the cluster members
	Impact of the work of the cluster organization on business activities of the cluster members
	Impact of business-oriented services of the cluster organization on business activities of the SME members
	Degree of internationalization of cluster members
	Impact of the work of the cluster organization on international activities of the cluster members

Table 1: Benchmarking of cluster management organizations: dimensions and indicators

A similar approach was followed with regard to the benchmarking of cluster programs. In addition to structured face-to-face interviews with program owners that were conducted by experts of VDI/VDE Innovation + Technik GmbH, further data was collected through an online survey and the analysis of program documents. The benchmarking of cluster programs focused on two dimensions covering ten indicators (see Table 2). The collected data can be used to describe the strategy of a program in terms of its objectives, instruments, target groups and implementation as well as in terms of its effects (output, results and impacts). Further attention was paid to the coordination of the cluster programs with other relevant programs.

Dimensions	Indicators
Strategic set up of programs	Objectives of the program
	Beneficiaries
	Technological and scientific focus
	Program budget
	Funding priorities
	Instruments
	Output, results and impact of the program (e.g. in terms of R&D, business development and internationalization of cluster members)
	Implementation procedures
	Monitoring and evaluation
Context of the program	Coordination with other relevant programs

Table 2: Benchmarking of cluster programs: dimensions and indicators

2 Results of the Benchmarking of Cluster Management Organizations

In order to understand the characteristics of cluster management organizations and their interaction with cluster actors in more detail, more than 140 cluster management organizations were benchmarked in terms of the structure of the cluster, cluster management and cluster governance, financing, services provided by the cluster management organization and achievements and recognition of the cluster management organizations.

This chapter presents the results of the benchmarking of cluster management organizations. The comparative portfolio is explained in chapter 2.1, while chapter 2.2 introduces the findings of the benchmarking in terms of the general characteristics of cluster management organizations and clusters. Chapter 2.3 presents five key findings that provide further insight into the characteristics of cluster management organizations and clusters. Chapter 2.4 presents key determinants for the impact of a cluster on business activities of cluster members.

Key findings were made with regard to the difference between research- and industry-driven clusters, the impact of cluster management organizations on the cluster in terms of business and R&D activities, the effect of the technology area on cluster characteristics and the impact of services provided by the cluster management organization on the development of the cluster.

2.1 Comparative Portfolio

The comparative portfolio of this benchmarking project includes a total number of 143 clusters from eight countries (see Figure 2). The majority of the clusters were located in Germany (55 clusters), Denmark (26 clusters) and Poland (20 clusters).



Figure 2: Number of clusters per participating country

Table 3 shows the distribution of the clusters according to technology areas:

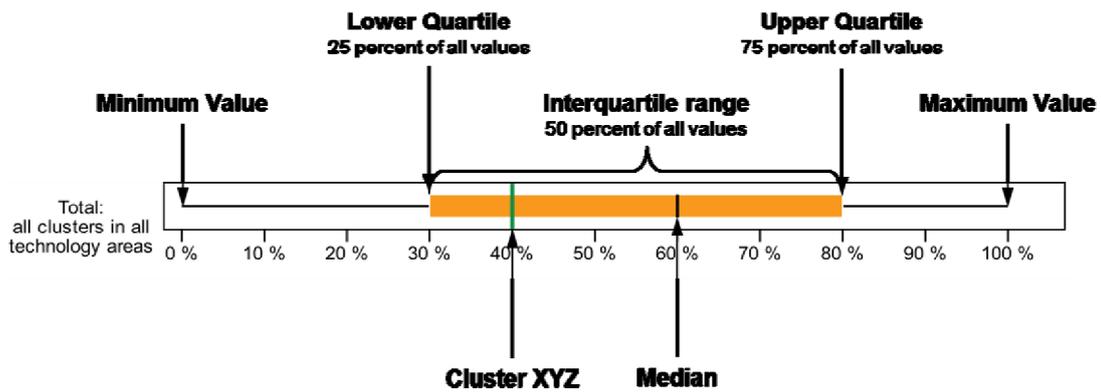
Technology areas	Number of clusters	Share
Aviation and space	5	3.5 %
Biotechnology	7	4.9 %
Construction/building sector	3	2.1 %
Energy and environment	23	16.1 %
Food industry (non-biotech)	11	7.7 %
Health and medical science	9	6.3 %
Humanities/social sciences, media, design and service innovation	15	10.5 %
Information and communication	20	14 %
Micro, nano and optical technologies	16	11.2 %
New Materials and chemistry	11	7.7 %
Production and engineering	17	11.9 %
Transportation and mobility	6	4.2 %
Total	143	100 %

Table 3: Number of clusters per technology area

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

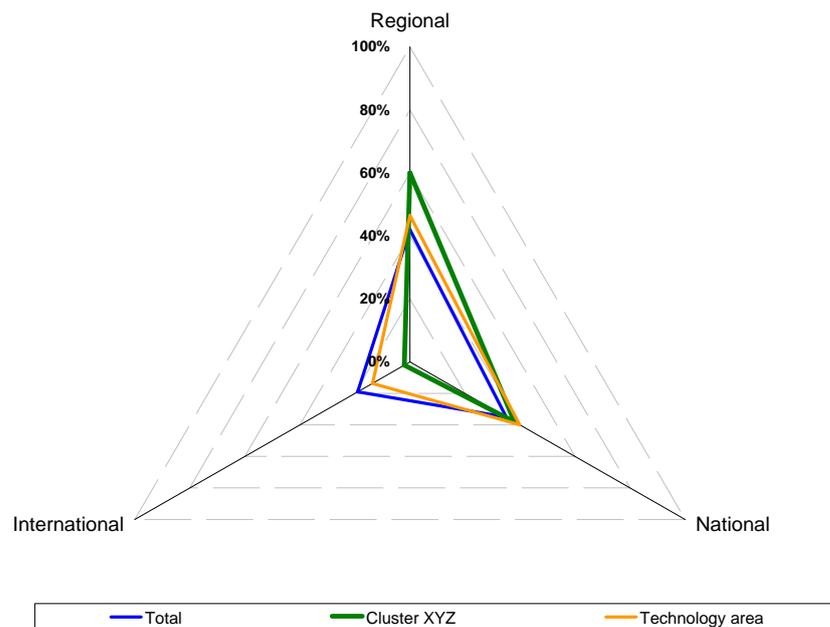
Boxplot

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 inter-quartile 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).



2.2 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. The overview includes data on

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

2.2.1 Age of the Cluster Management Organizations

The establishment of the majority of cluster management organizations started in Germany and Finland already at the end of the 1990s followed by Denmark, Norway, Sweden, Poland and Iceland (see Figure 3).

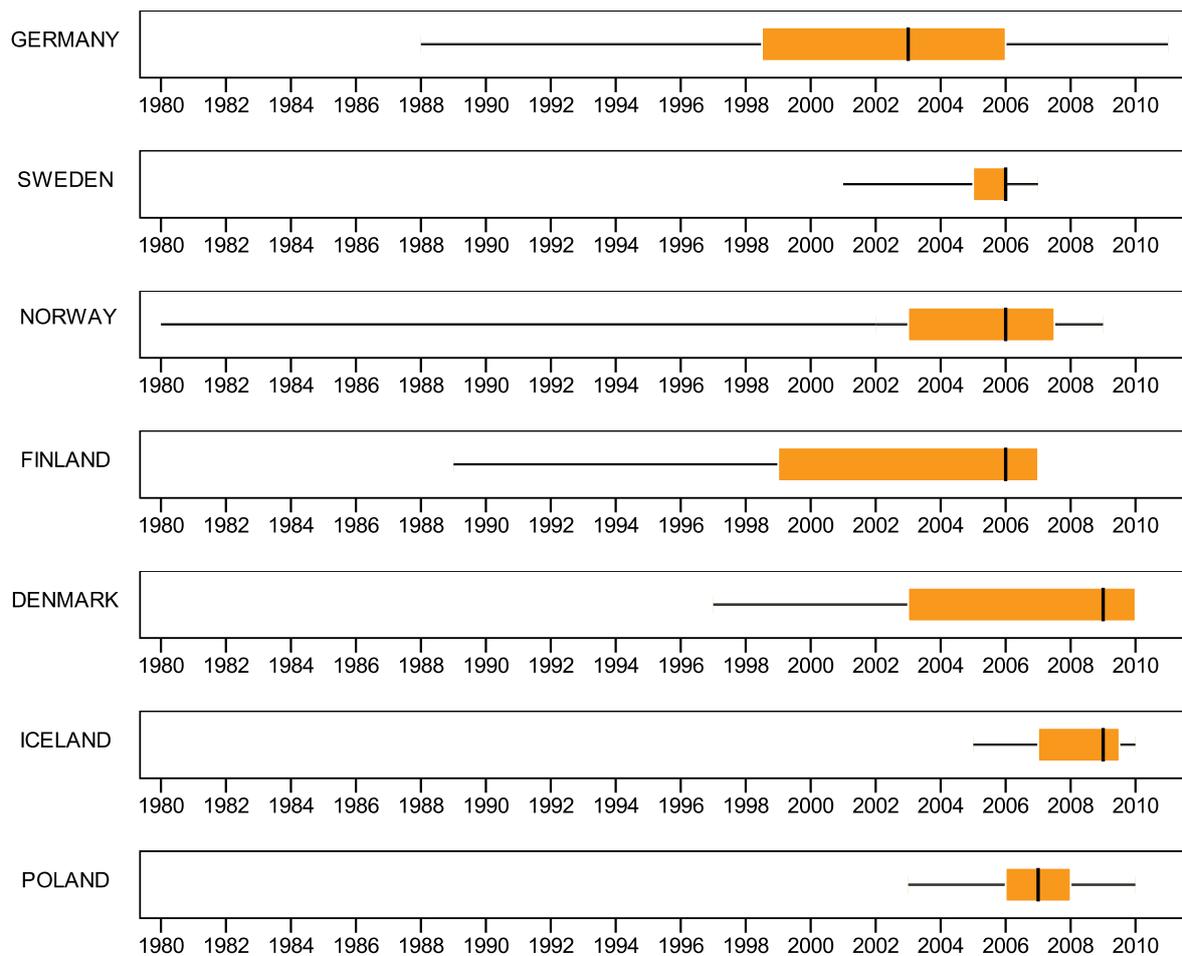


Figure 3: Age of cluster management organizations

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.

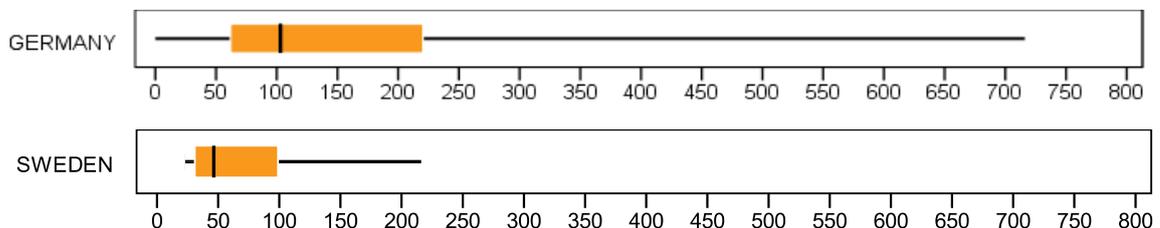
An interesting observation concerns the length of cluster institutionalization processes. While the majority of clusters in Germany were established during an eight-year period between 1998 and 2006, and in Finland between 1999 and 2007, the length of these processes was much shorter in other countries, 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, it is most likely that other dynamics such as specific developments in individual industries also had an effect on the date of establishment.

2.2.2 Size of Clusters

For the purpose of this project the size of clusters was measured in terms of numbers of members who are committed to the work of the cluster management organization. A committed member is a member who meets at least one of the following criteria:

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

Figure 4 presents the composition of the membership of clusters in terms of total number of members. The total number includes members from the following categories: SME¹³, 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 members that is important.



¹³ 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.

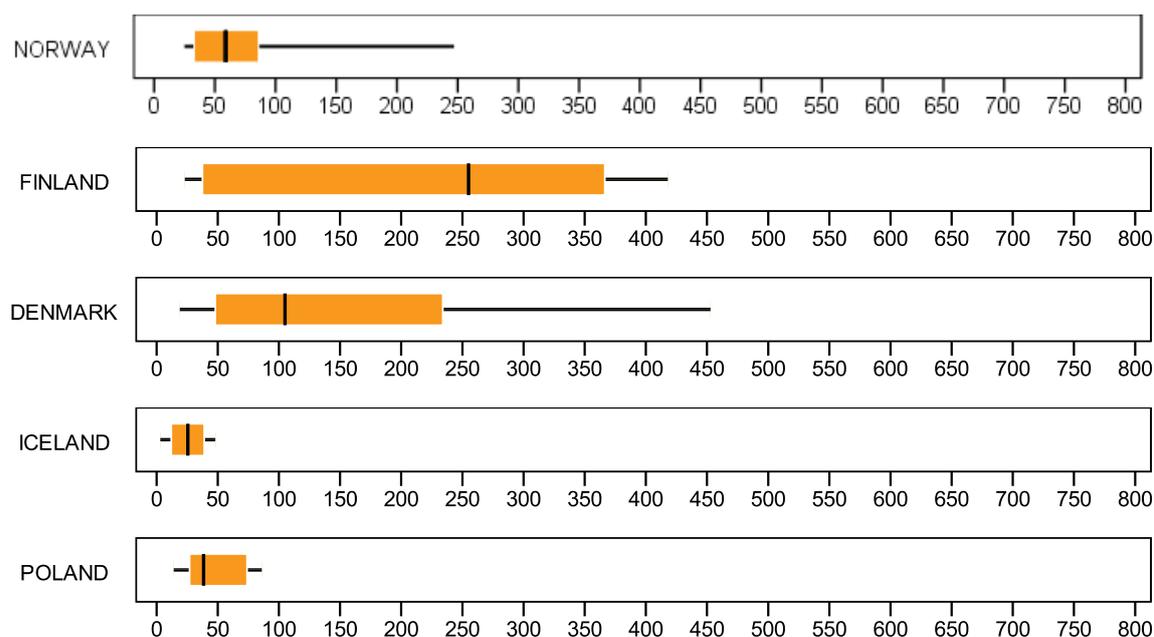


Figure 4: Size of clusters (total number of committed members)

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 sizes of Finnish 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.

2.2.3 Composition of Membership

Figure 5 displays the typical composition of the cluster membership for each country (only with regard to the clusters that have participated in the benchmarking project).

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 (93 per cent, SME: 88 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 13 per cent of all stakeholders), followed by Denmark (10 per cent), Sweden (10 per cent), Norway (10 per cent), Poland (8 per cent) and Finland (3 per cent). The composition of the membership can depend on the specific requirements of the national cluster programs.

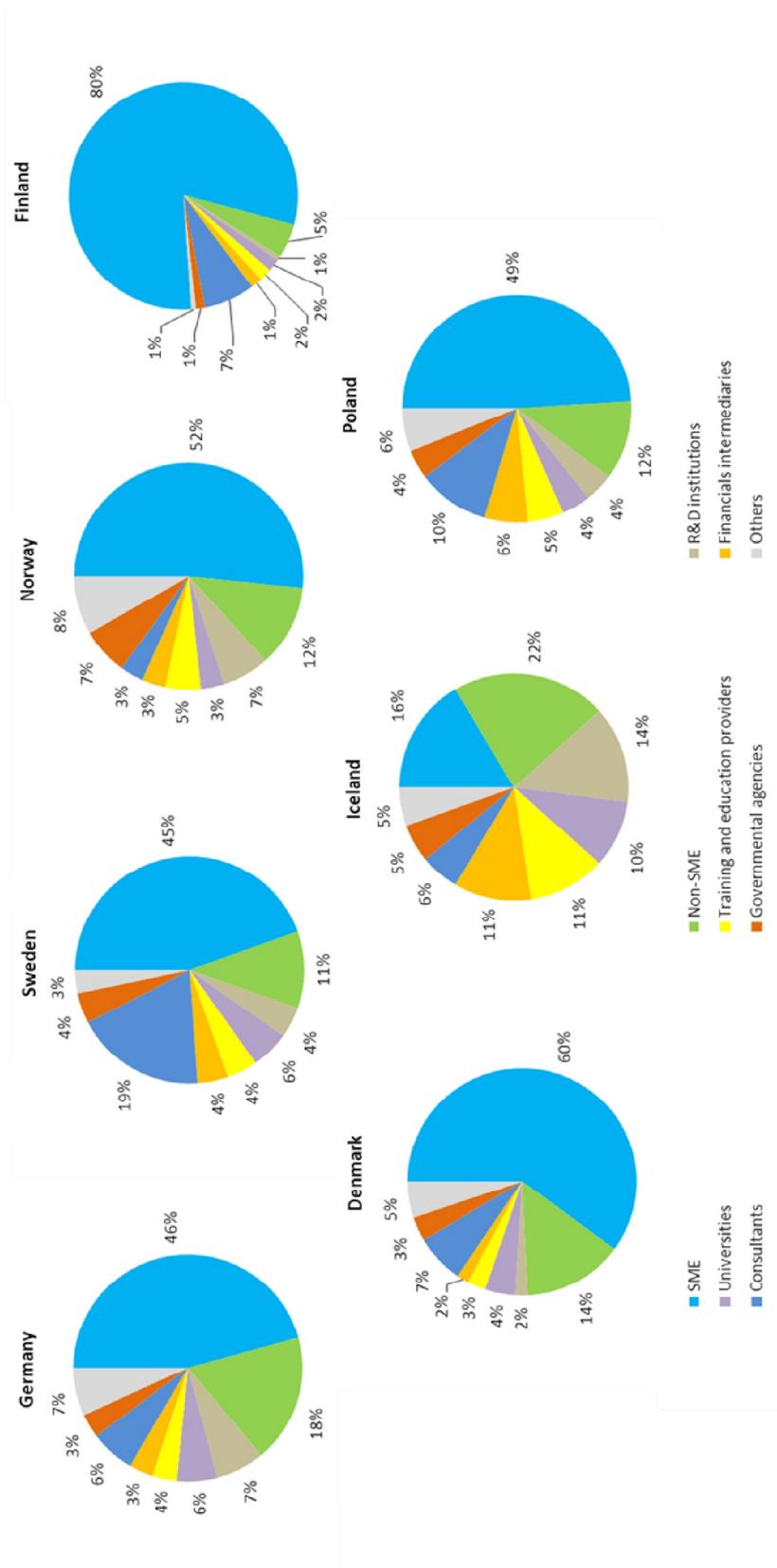


Figure 5: Composition of membership (median value)

2.2.4 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”.¹⁴ 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 develop and implement 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 6 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.

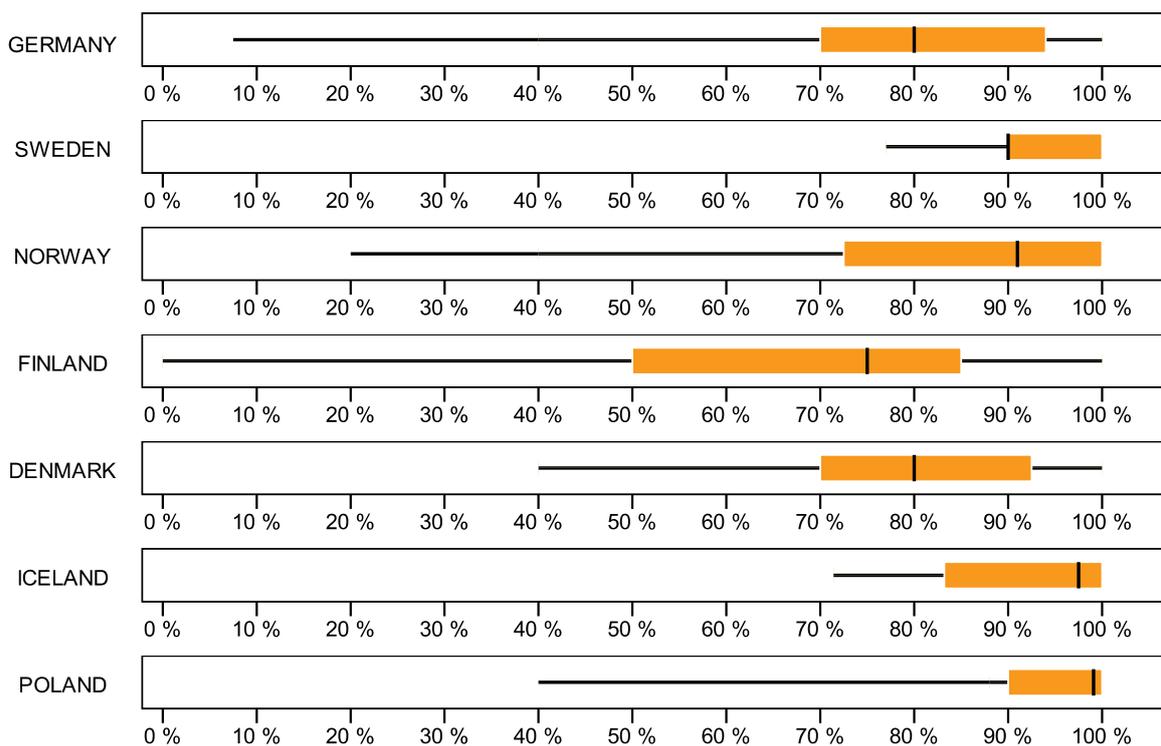


Figure 6: Regional concentration of clusters

¹⁴ Michael E. Porter, 1998: Clusters and the New Economics of Competition, in: Harvard Business Review, November/December 1998, p. 78

2.2.5 Financing of Cluster Management Organizations

Many cluster management organizations depend on public funding to finance staff and other resources, such as office space and equipment (see Figure 7). Sources of public funding can be project-based grant funding or institutional funding, e.g. through the secondment of public servants to the cluster management office or the provision of office space. 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 (if there is one). Cluster management organizations can be funded from different regional, national and European funding programs.

The small share of public funding in 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).

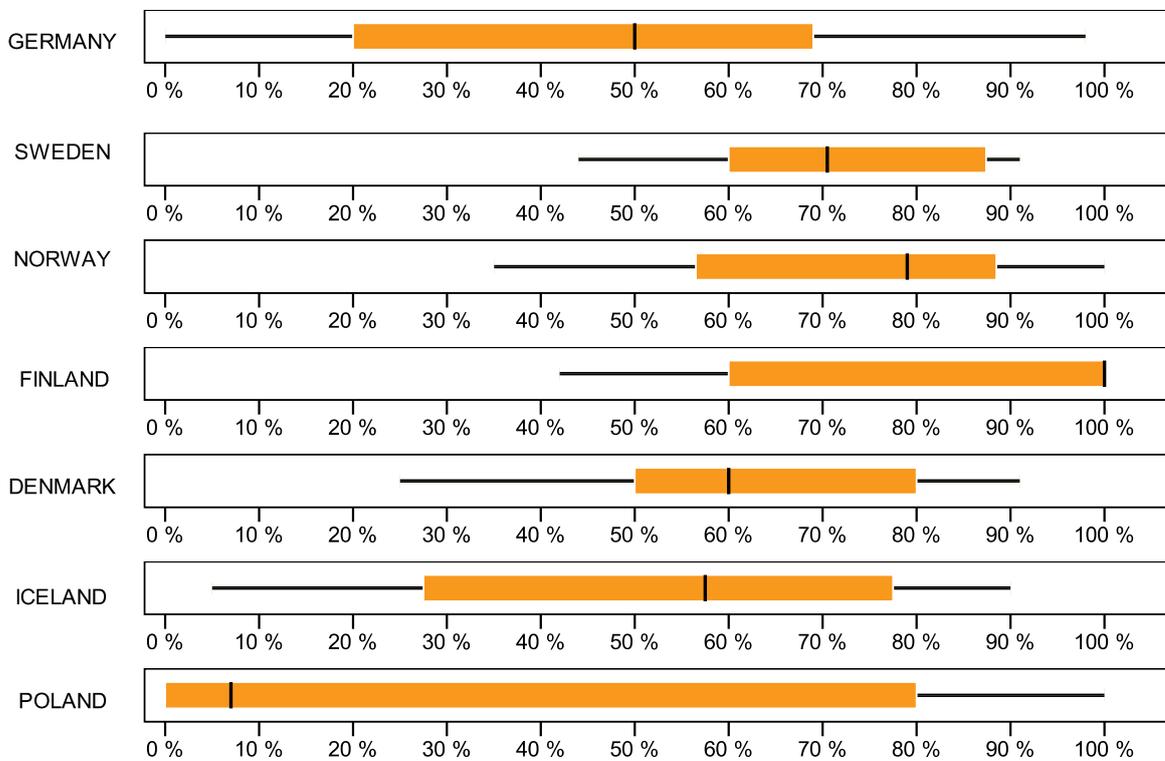


Figure 7: Share of public funds in total budget of cluster management organizations

The majority of cluster management organizations (77 out of 143 cluster management organizations) depend to more than 60 per cent on public funding. The budget of 43 cluster management organizations (roughly one third of the comparative portfolio) depends to more than 80 per cent on public funding. Only 29 cluster management organizations depend to less than 19 per cent on public funding (see Table 4).

Share of public funding in total funding	0 – 19 %	20 – 39 %	40 – 59 %	60 – 79 %	> 80%
Number of clusters	29	11	26	34	43

Table 4: Share of public funding in total funding of cluster management organizations

2.3 Key Findings

The analysis of the data that was gathered through the benchmarking of 143 cluster management organizations has yielded five key findings which are further detailed in this chapter. The key findings (see Table 5) give further insight into the characteristics of clusters, particularly with regard to the difference between research- and industry-driven clusters, the impact of cluster management organizations on the cluster in terms of business and R&D activities, the effect of the technology area on cluster characteristics and the impact of services provided by the cluster management organization on the development of the cluster. With regard to the key findings there is no country-specific analysis as there are no significant differences that can be explained by country-specific variables.

Key findings	
1.	Research-driven clusters are much more similar to industry-driven clusters than expected
2.	Clusters with a low or high share of public funding are similar in terms of structure and governance, but different in terms of impact
3.	The visibility and attractiveness of a cluster and the impact of the cluster management organization on SME development depends on its size, age, institutionalization and degree of industrial orientation
4.	The characteristics of a cluster depend on the technology field it is operating in
5.	Clusters with a high impact on business activities of SME feature an active cluster management

Table 5: Overview of key findings

2.3.1 Research-driven Clusters are much more similar to Industry-driven Clusters than Expected

Research-driven clusters whose objectives and activities are set by research-actors such as research institutions or universities are much more similar to industry-driven clusters whose agenda is set by companies than previous research suggested.

Between these two types of clusters there are no or only minor differences in terms structural factors such as financing, governance, legal form, regional concentration and degree of specialization. R&D-driven clusters are a little bit smaller in terms of numbers of members than industry-driven clusters. They are also significantly younger than industry-driven clusters (see Figure 8).

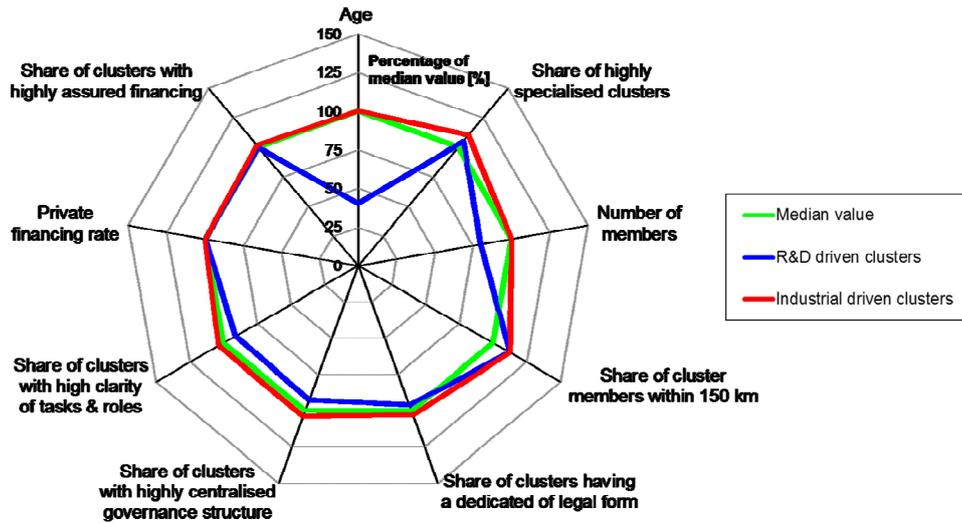


Figure 8: Comparison of R&D- and industry-driven clusters in terms of structural factors

Although research-driven and industry-driven clusters are similar in terms of structural factors, they are different in terms of output and impact (see Figure 9). While both types of clusters are rather similar when it comes to the initiation of successful cooperation, they are very much different when it comes to the impact on cluster members. Industry-driven clusters have a bigger impact on R&D activities and business activities of SME than R&D-driven clusters have. In contrast, the impact on R&D activities of research institutions is bigger in R&D-driven clusters. This implies that the specific impact of a cluster on business or R&D activities of its members depends on the agenda setter: if companies set the agenda they benefit more, if research institutions or universities set the agenda they benefit more.

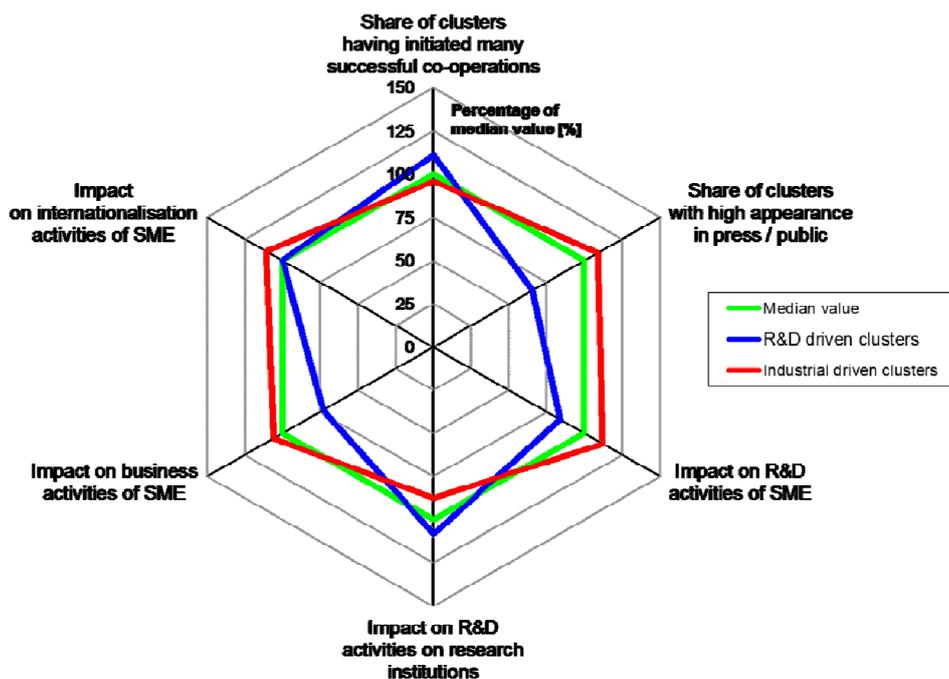


Figure 9: Comparison of R&D- and industry-driven clusters in terms of output and impact

Research-driven clusters show much lesser impact on business activities of SME than industry-driven clusters, while the difference is a little bit smaller when it comes to the impact on R&D activities. This can be explained by the specific focus of companies in research-driven clusters on product development. Companies in biotechnology clusters for example spend a lot of efforts on the development of drugs and less on sales and marketing because they first have to develop a product that meets pharmaceutical or other standards before they can market it. Often less attention is therefore paid to sales and marketing issues.

The rather similar performance of both types of clusters in terms of their impact on internationalization activities of SME can be explained by the specific nature of research-driven clusters. Their company members often put less emphasis on sales and marketing than on product development which they often do in the context of international collaborations. Again, the biotechnology sector is a very good example for this pattern. Clusters in this area are typically research-driven and their SME members typically either collaborate with international partners in R&D projects or do contract research for large pharmaceutical corporations that are headquartered abroad, e.g. in Switzerland. Data from the benchmarking backs this hypothesis, which can be developed also for other sectors such as micro, nano and optic or energy and environment (for further details see chapter on the effect of the technology domain on the performance of clusters).

Research-driven clusters appear less frequently in media than industrial-driven clusters do. This may be attributed to cluster-specific interests in the extent of press and media coverage. Industry-driven clusters and their members have a larger interest in a wide press and media coverage than research-driven clusters and their members have. A wide press and media coverage is essential for sales and marketing, thus industry-driven clusters promote their activities, products and services more actively. In contrast, R&D-driven clusters and their members tend to limit their efforts to scientific journals and are less interested in a broader “more public” press and media coverage as they are more interested in “discussing research results than in selling products”.

2.3.2 Clusters with a Small or High Share of Public Funding are Similar in Terms of Structure and Governance, but Different in Terms of Impact

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 10).

There are more clusters with a high industrial orientation 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), their governance structure is more often centralized 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 report a financial situation for the next three years that is less secured compared to cluster management organizations that are funded to a large extent by public means.
- Cluster management organizations that are funded to a large extent by private means are often older.

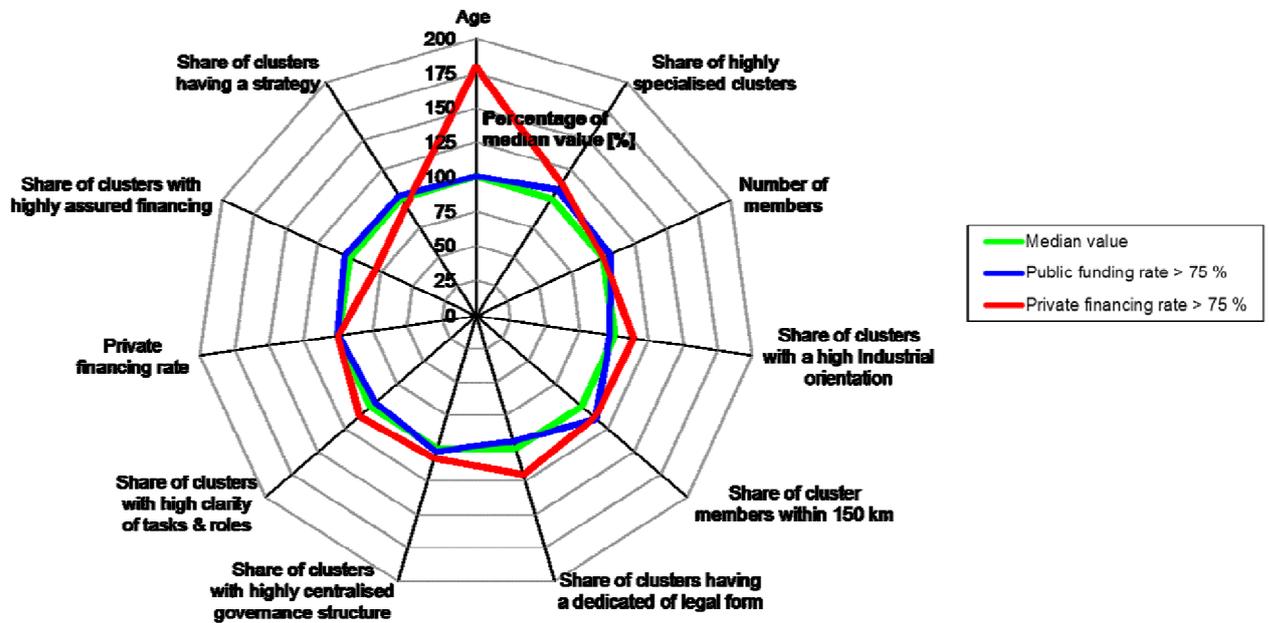


Figure 10: Characteristics of clusters with a small or a high share of public funding

When it comes to impact of cluster management organizations, those with a high share of private funding perform better (see Figure 11). Cluster management organizations that depend to a large degree on private funding have a larger impact on R&D activities of SME, R&D activities of research institutions, business activities of SME and internationalization activities of SME. The explanation for this pattern is quite obvious: private financiers have a pronounced expectation of a return of investment. Public funding organizations also expect a return of investment, but they impose less pressure upon beneficiaries, particularly in the case of grant funding. It is much easier for a private financier to terminate his financial support in case of non-performance than it is for a program owner. Private support is normally based on a contract that clearly outlines results and deliverables as well as sanctions for non-performance. In contrast, a typical grant program also defines results and deliverables, but lacks sanctions for non-performance.

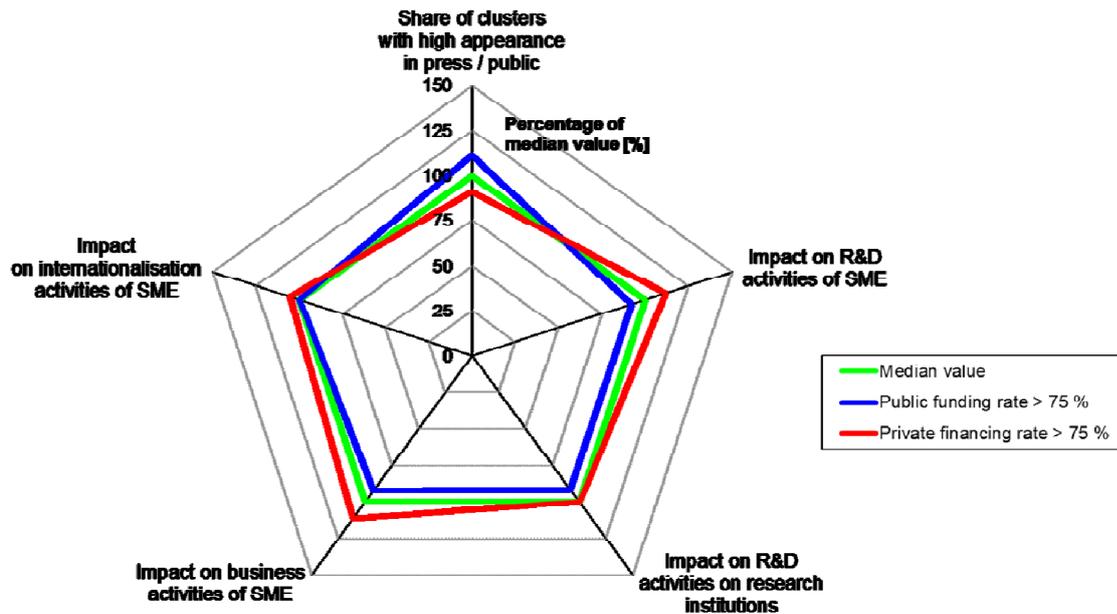


Figure 11: Impact of clusters with a small or high share of public funding

2.3.3 The Visibility and Attractiveness of a Cluster and the Impact of the Cluster Management Organization on SME Development Depends on Certain Determinants

There is a strong correlation between the age and the size of a cluster and the impact 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 cooperations and therefore have a larger impact. This is also an indicator for the cluster's attractiveness and its visibility in terms of press and media coverage (see Figure 12). Apparently, larger and matured clusters provide a much better environment for results and impacts as an effect of activities of a cluster management organization.

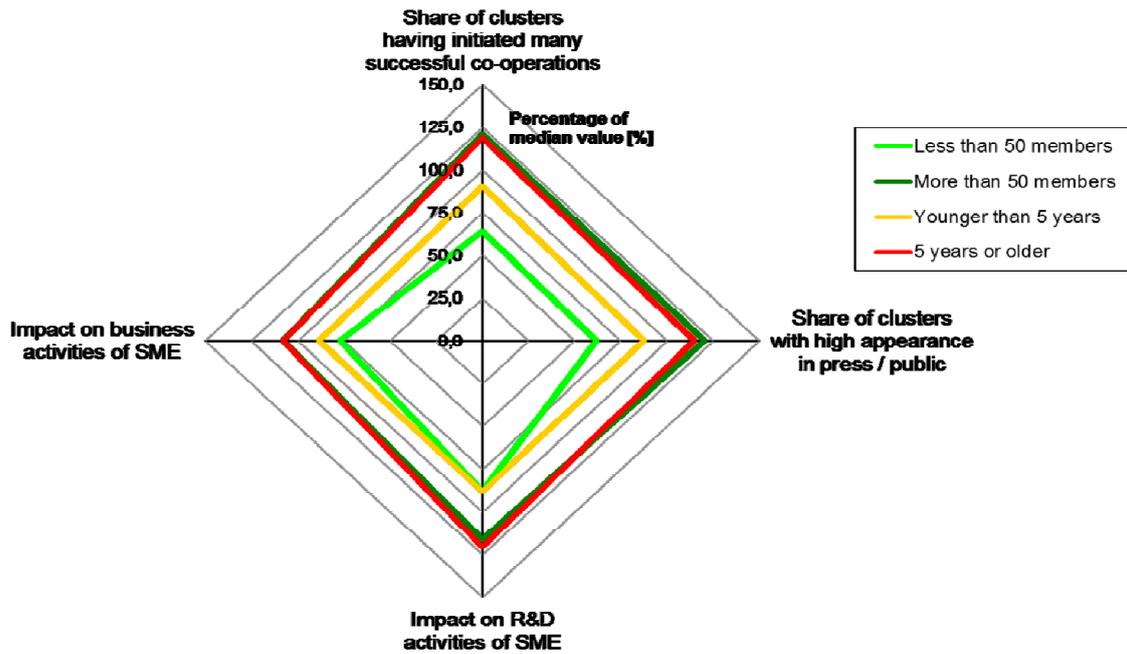


Figure 12: Effect of age and size on the impact

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 13).

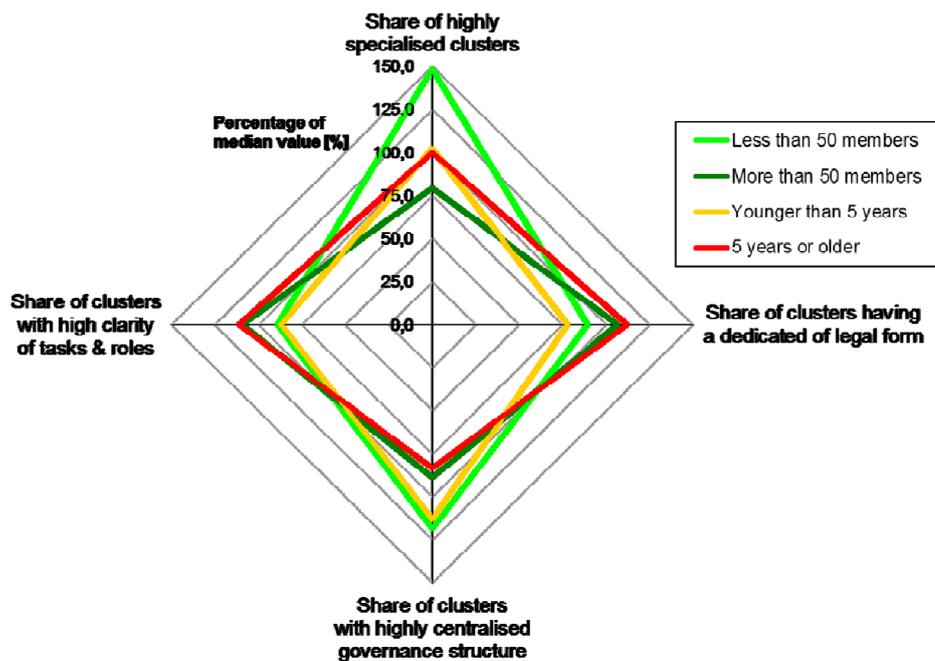


Figure 13: Effect of age and size on the institutionalization of a cluster

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 trustful relationships between the partners, it is not surprising that old and large institutionalized clusters show a higher impact for example on business and R&D activities of SME than small and young cluster do.

The increased institutionalization of rules and processes also affects the governance structure. While in young and small clusters with a less-developed institutional structure the cluster management organization apparently acts as the hub of the cluster and the main initiator of activities in a centralized governance structure, the cluster management organization in a large and older cluster still has a significant influence, but is not any longer the main initiator of activities. The larger and older a cluster is, the lesser its governance structure is centralized and collaboration between the cluster members can be described as decentralized. In such an environment institutions become more and more relevant as they provide orientation for the cluster members. The successful performance of the cluster management organization in terms of its impact on members depends in a decentralized governance environment eventually on the existence of widely accepted institutionalized roles and responsibilities.

Another interesting pattern is that the smaller clusters are, the more they are specializing in a particular field (see Figure 13). 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 14 shows that clusters that have a high impact 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 have more often a clear assignment of tasks and responsibilities of their actors compared to the median value of all analyzed clusters. They also show a higher industrial orientation and higher regional concentration of its members.

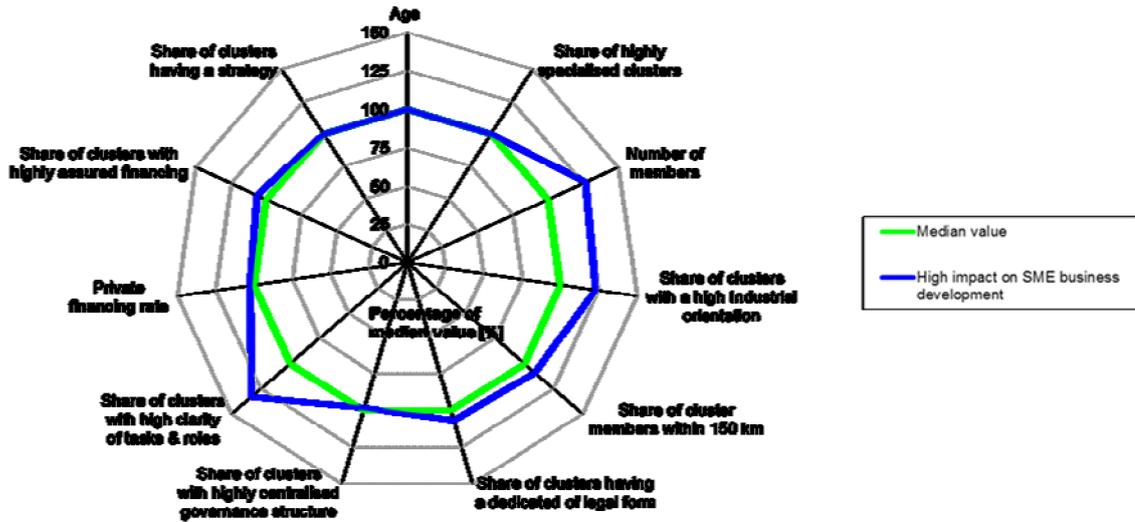


Figure 14: Characteristics of clusters with a high impact on business activities of SME

2.3.4 The Characteristics of a Cluster Depend on the Technology Field it is operating in

The characteristics of a cluster depend very much on the technology field it is operating in. Figure 15 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 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.

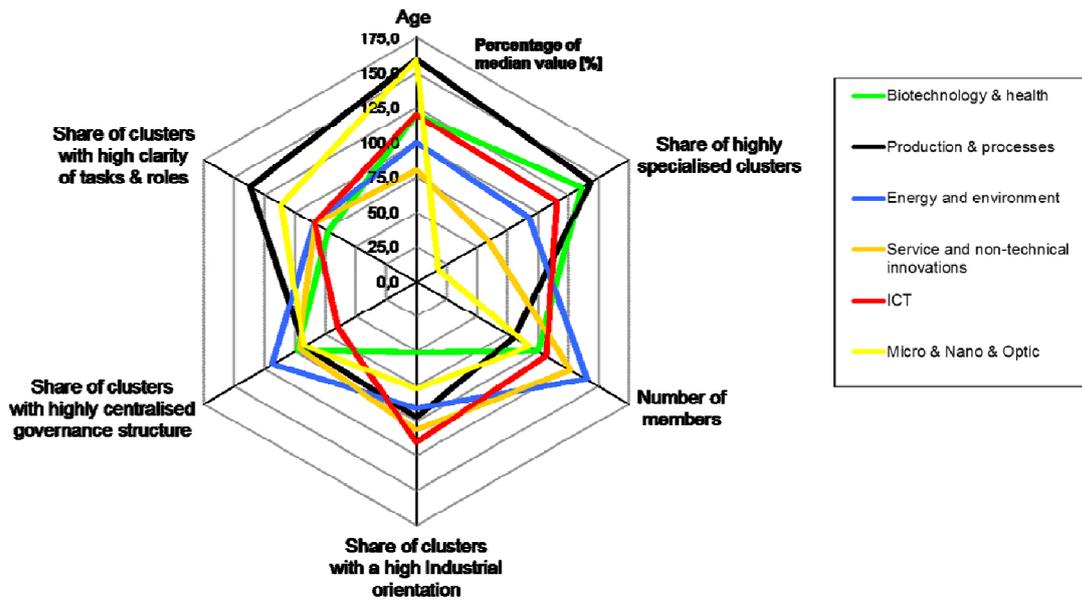


Figure 15: Structural characteristics of clusters in different technology fields

There are also huge 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 16).

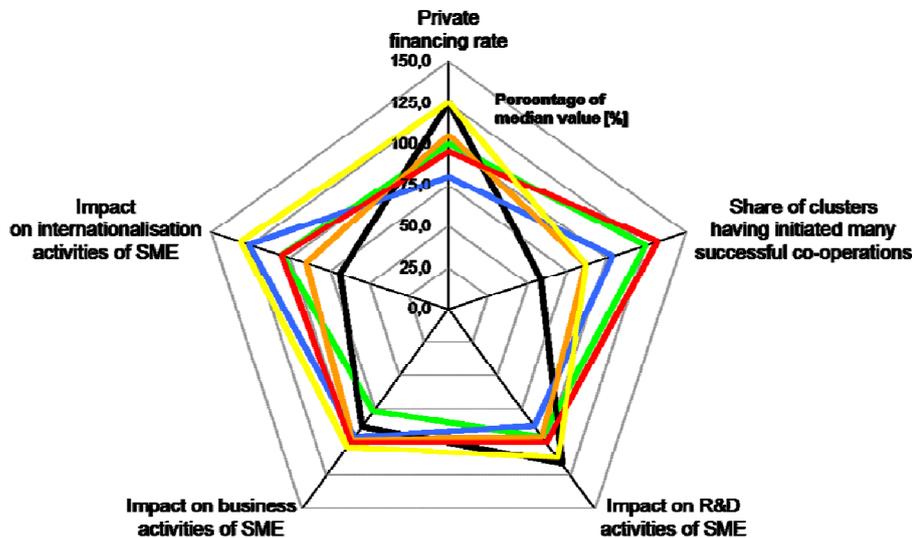


Figure 16: Impact and private funding of clusters in different technology areas

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.

2.3.5 Clusters with a High Impact on Business Activities of SME Feature an Active Cluster Management

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 17 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.

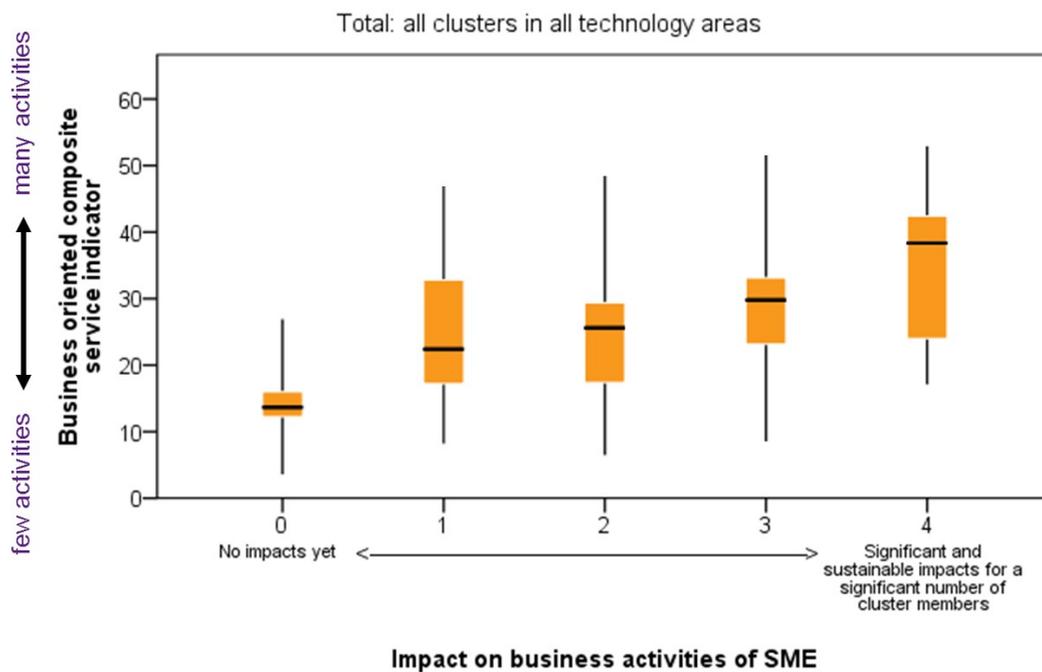


Figure 17: Impact of spectrum and intensity of services on business activities of SME (1)

The analysis of this pattern for specific types of clusters provides further interesting insights into this correlation (see Figure 18):

- Larger clusters with more than 50 members, clusters that are driven by industry and clusters whose cluster management organization is largely funded by private means (share of private funding in total budget is higher than 75 per cent) feature a high spectrum and intensity of business-oriented-services and impact of the cluster management organization’s work on the business activities of SME. In these types of clusters the cluster management organization is very active in developing and providing services for SME in order to support their business activities.
- Smaller clusters with less than 50 members, clusters that are driven by R&D stakeholders and clusters whose cluster management organization is largely funded by public means (share of

public funding in total budget is higher than 75 per cent) feature a small spectrum and intensity of business oriented-services and a low impact of the cluster management organization’s work on the business activities of SME. In these types of clusters the cluster management organization is not very active in developing and providing services for SME in order to support their business activities.

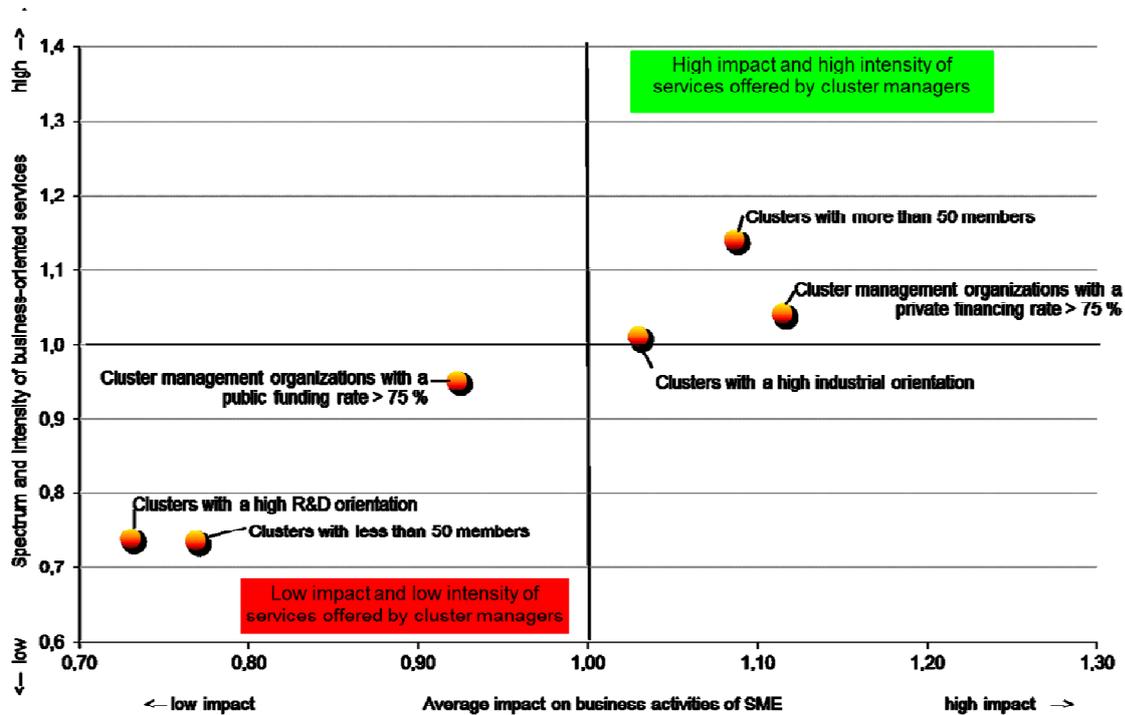


Figure 18: Impact of spectrum and intensity of services on business activities of SME (2)

Against the backdrop of the other key findings the difference can be explained by the specific nature of the different types of clusters with regard to the source of funding of the cluster management and the agenda setters, but also with regard to the size:

- The more a cluster management organization depends on private funding, the more it has to respond to the interests of their financiers, which are mostly businesses that have a pronounced expectation of a return of investment.
- The more cluster members are interested in making business instead of R&D, the more they are interested in receiving corresponding services from the cluster management. Therefore, it is not very surprising that R&D-driven clusters, whose members are rather interested in R&D than in sales and marketing, feature a cluster management that provides fewer services for business support because there is no or only limited demand for it.
- The size of a cluster matters in so far that the larger a cluster is in terms of numbers of members the more the demand for coordination activities arises from the cluster members. The cluster management organization has to respond to this through offering corresponding services.

2.4 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 share of private funding in the total budget of the cluster management organization as well as 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 19 displays the causal relationship of structural factors and agenda setters, services and impacts: 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.

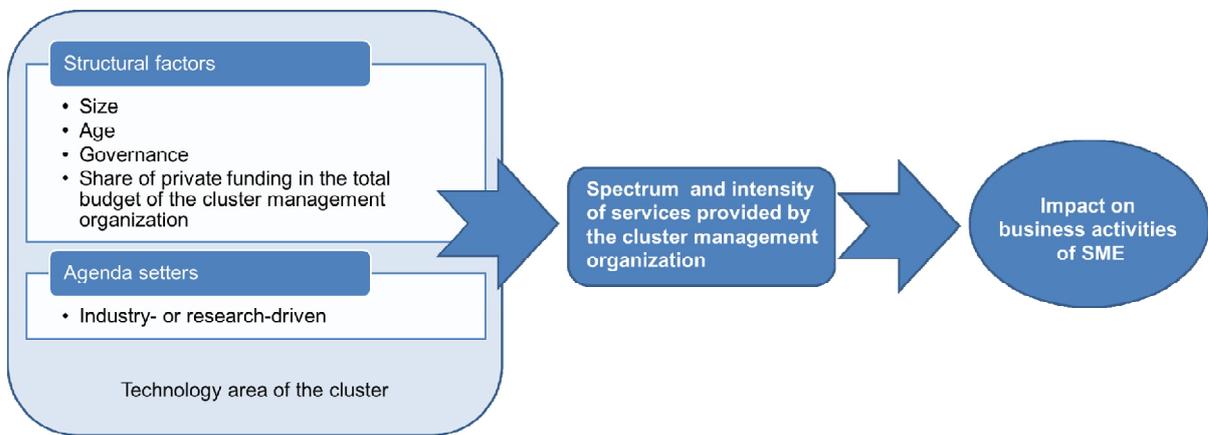


Figure 19: Key determinants for impact on business activities of cluster members

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 impact 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.¹⁵ 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)	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Regular meetings, get-togethers, thematic events/workshops for cluster members • Internal newsletters, databases etc.
Development of human resources	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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

Table 6: Services of cluster management organizations

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

¹⁵ 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

3 Results of the Benchmarking of Cluster Programs

In recent years cluster policies and cluster programs have increasingly gained weight on the political agenda. 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 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.

This chapter presents the results of the benchmarking of cluster programs. Chapter 3.1 introduces the comparative portfolio, which consists of 16 cluster programs from nine 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, 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 cluster, the relevance of cluster management excellence in the programs, monitoring and evaluation practices and lessons learned by the program owners. Chapter 3.4 outlines a perfect cluster program with regard its overall strategic set up, target group, instruments and implementation.

3.1 Comparative Portfolio

The cluster program benchmarking covered 16 cluster programs from Denmark, Germany, Norway, Sweden, Finland, Iceland, Poland, France and Greece (see Table 7). 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.

Country	Name of program	Internet
Denmark	Innovation Networks Denmark (Innovations-netværk Denmark)	www.innovationsnetvaerk.dk
Germany	Competence Networks Germany (Initiative Kompetenznetze Deutschland)	www.kompetenznetze.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
Norway	Norwegian Centres of Expertise (NCE)	www.nce.no

	Arena Program (Arena-programmet)	www.arena-programmet.no
Sweden	Vinnväxt	www.vinnova.se/en/activities/vinnvaxt
	Regional Cluster Program (Regionalt klusterprogram)	www.tillvaxtverket.se
Finland	Centre of Expertise Program (OSKE, Osaamiskeskusohjelma)	www.oske.net
	Strategic Centres for Science, Technology and Innovation (SHOK, Strategisen huippuosaamisen keskittymät)	www.tekes.fi
Iceland	Strategic Research Program for Centres of Excellence and Research Clusters (The Icelandic Centre for Research (Rannsóknamiðstöð Íslands))	www.rannis.is
	Regional Growth Agreements (Vaxtarsamningur)	www.vaxtarsamningur.is
Poland	Polish Cluster Support Schemes: Support for the development of Supra-Regional Clusters and Cluster Creation in Eastern Poland	www.parp.gov.pl
France	Grappe d'entreprises	www.territoires.gouv.fr/grappes-entreprises
Greece	Corallia Cluster Initiative „Semiconductor-Nano/Microelectronics-Embedded Systems in Greece“	www.corallia.org

Table 7: Overview of cluster programs

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”.

3.2 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

3.2.1 Overall Objectives of the Cluster Programs

The cluster programs that have participated in the benchmarking feature a diverse set of overall objectives (see

Table 8). 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 (for further details on this see chapter “3.3.1 Different Types of Cluster Programs Serve Different Purposes”).

Name of the program	Overall objectives
Innovation Networks Denmark	<ul style="list-style-type: none"> 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
Competence Networks Germany	<ul style="list-style-type: none"> 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
Norwegian Centres of Expertise (NCE)	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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
Vinnväxt	<ul style="list-style-type: none"> To promote sustainable growth in regions by developing competitive research and innovation environments within specific growth fields
Regional Cluster Program	<ul style="list-style-type: none"> Strengthening of regional systems of innovation through the support of cluster initiatives that are looking to strengthen their renewal capacity and competitiveness by means of commercial collaboration, cluster expansion and networking
OSKE – Centres of Expertise Program	<ul style="list-style-type: none"> To create new innovations, products, services, companies and jobs based on top-class expertise To support inter-regional 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	<ul style="list-style-type: none"> 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
Polish Cluster Support	<ul style="list-style-type: none"> Increased competitiveness of the Polish economy through

	the support of the establishment and development of clusters at the national and regional level
Cluster Offensive Bayern	<ul style="list-style-type: none"> To support the global competitiveness of the Bavarian economy
Cluster Policy Strategy of Hamburg	<ul style="list-style-type: none"> Medium and long term support of economic growth and employment
Regional Growth Agreements (Vaxtarsamningur)	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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
Grappe d'entreprises	<ul style="list-style-type: none"> Development of business clusters in economic sectors with weak R&D activity
Corallia – Hellenic Technology Clusters Initiative (Aid Measure for Microelectronics and Embedded Systems)	<ul style="list-style-type: none"> Development of the Greek semiconductor-nano/microelectronics-embedded systems sector by utilizing and supporting a clustering framework
Zentrales Innovationsprogramm Mittelstand – Netzwerkprojekte (ZIM NEMO)	<ul style="list-style-type: none"> Development of innovation capacities and competitiveness of SME through the support of innovation networks

Table 8: Overall objectives of the cluster programs

3.2.2 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 (see Table 9). 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 “Competence Networks Germany” and “Cluster Offensive Bayern”, the Norwegian programs “Norwegian Centres of Expertise” and “Arena” and the Icelandic program “Strategic Research Program for Centres of Excellence and Research Clusters” – 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.

Name of the program	Establishment of new cluster organizations	Further development of already existing matured cluster organizations
Innovation Networks Denmark	X	X
Competence Networks Germany		X
Norwegian Centres of Expertise (NCE)		X
Arena Program	X	
Vinnväxt	X	X
Regional Cluster Program	X	X
OSKE – Centres of Expertise Program	X	X
SHOK – Strategic Centres for Science, Technology and Innovation	X	X
Polish Cluster Support	X	X
Cluster Offensive Bayern		X
Cluster Policy Strategy of Hamburg	X	X
Regional Growth Agreements (Vaxtarsamningur)	X	X
Strategic Research Program for Centres of Excellence and Research Clusters	X	
Grappe d'entreprises	X	X
Corallia – Hellenic Technology Clusters Initiative (Aid Measure for Microelectronics and Embedded Systems)	X	
Zentrales Innovationsprogramm Mittelstand – Netzwerkprojekte (ZIM NEMO)	X	

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

3.2.3 Strategic Objectives in Terms of Numbers of Clusters etc.

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 (see Table 10).

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. Innovation Networks Denmark, the Norwegian Centres 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.

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?
Innovation Networks Denmark	Yes	No	Yes
Competence Networks Germany	No	No	No
Norwegian Centres of Expertise (NCE)	Yes	No	Yes
Arena Program	No	No	Yes
Vinnväxt	No	No	No
Regional Cluster Program	No	No	No
OSKE – Centres of Expertise Program	Yes	Yes	Yes
SHOK – Strategic Centres for Science, Technology and	No	No	No

Innovation			
Polish Cluster Support	No	No	No
Cluster Offensive Bayern	No	Yes	No
Cluster Policy Strategy of Hamburg	No	Yes	Yes
Regional Growth Agreements (Vaxtar-samningur)	No	No	No
Strategic Research Program for Centres of Excellence and Research Clusters	No	No	No
Grappe d'entreprises	No	No	No
Corallia – Hellenic Technology Clusters Initiative (Aid Measure for Microelectronics and Embedded Systems)	n.a.	n.a.	n.a.
Zentrales Innovationsprogramm Mittelstand – Netzwerkprojekte (ZIM NEMO)	No	No	No

Table 10: Strategic objectives of cluster programs in terms of numbers of clusters to be supported etc.

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”.¹⁶ 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 (see chapter 2.3.5 for further details about the link between services and impact) would be one of the results of

¹⁶ Michael E. Porter, 1998: Clusters and the New Economics of Competition, in: Harvard Business Review, November 1998, p. 78

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.

3.2.4 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 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 re-orientation.

There is only one cluster program, the “Cluster Offensive Bayern”, which follows a dedicated top-down approach. 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.

Name of the program	Top-down	Bottom-up
Innovation Networks Denmark	X	X
Competence Networks Germany	n.a.	n.a.
Norwegian Centres of Expertise (NCE)		X
Arena Program		X
Vinnväxt	X	X
Regional Cluster Program		X
OSKE – Centres of Expertise Program		X
SHOK – Strategic Centres for Science, Technology and Innovation	X	X

Polish Cluster Support		X
Cluster Offensive Bayern	X	
Cluster Policy Strategy of Hamburg	X	X
Regional Growth Agreements (Vaxtarsamningur)		X
Strategic Research Program for Centres of Excellence and Research Clusters		X
Grappe d'enterprises		X
Corallia – Hellenic Technology Clusters Initiative (Aid Measure for Microelectronics and Embedded Systems)	X	X
Zentrales Innovationsprogramm Mittelstand – Netzwerkprojekte (ZIM NEMO)		X

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

3.2.5 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. “Competence Networks Germany” is the only program that provides no grant funding, 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'enterprises).

The extent to which technical assistance can be provided depends on the resources available to the programs. While Competence Networks Germany 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.

Name of the program	Funding	Technical assistance (e.g. provision of training and consultancy services)
Innovation Networks Denmark	X	X
Competence Networks Germany		X
Norwegian Centres of Expertise (NCE)	X	X
Arena Program	X	X
Vinnväxt	X	X
Regional Cluster Program	X	X
OSKE – Centres of Expertise Program	X	
SHOK – Strategic Centres for Science, Technology and Innovation	X	
Polish Cluster Support	X	X
Cluster Offensive Bayern	X	X
Cluster Policy Strategy of Hamburg	X	
Regional Growth Agreements (Vaxtarsamningur)	X	
Strategic Research Program for Centres of Excellence and Research Clusters	X	
Grappe d'entreprises	X	
Corallia – Hellenic Technology Clusters Initiative (Aid Measure for Microelectronics and Embedded Systems)	X	n.a.
Zentrales Innovationsprogramm Mittelstand – Netzwerkprojekte (ZIM NEMO)	X	

Table 12: Instruments of cluster programs

3.2.6 Technical Details: Term and Financial Aspects of Cluster Programs

Table 12 provides an overview for each cluster program about its term, budget, 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 aspects¹⁷

	Innovation Networks Denmark	Competence Networks Germany	Norwegian Centres of Expertise (NCE)	Arena Program	Vinnväxt
Term of the program	Year of inception: 2005, no date of termination	Since 1997	Year of inception: 2006, no termination date	Year of inception: 2002, no date of termination yet	2002-2015
Budget	EUR 10 million p.a.	EUR 1 million p.a.	EUR 8.3 million p.a.	EUR 5 million p.a.	EUR 8.8 million (SEK 79 million)
Type of funding	Grant funding and technical assistance	Only the management agency is funded to provide technical assistance. No funding of individual clusters.	Grant funding and technical assistance	Grant funding and technical assistance	Grant funding and technical assistance
Does the program have a specific technology focus?	No	No	No	No	No
Maximum funding period for a project	Up to four years (but can be extended after a positive evaluation)	n.a.	Ten years.	Up to five years.	Ten years
Is there a maximum amount of funding an applicant can apply for?	No	n.a.	Max. EUR 770.500 p.a.	Max. EUR 300,000 p.a.	Max. EUR 1.1 million p.a.
Financing structure of projects	Max. 50 % national government co-financing	n.a.	50% funding from the NCE program	Max. 50% funding from the program	Max. 50% funding from the program

¹⁷ The Cluster Policy Strategy of the Free and Hanseatic City does not feature in this overview as it is no funding program in the narrow sense. It incorporates a wide array of different funding programs from different ministries and governance levels. For an introduction to the Cluster Policy Strategy please see the appendix of this report.

	Regional Cluster Program	OSKE – Centres of Expertise Program	SHOK – Strategic Centres for Science, Technology and Innovation	Polish Cluster Support	
				Innovative Economy Operational Program, Measure 5.1 “Support of the Development of supra-regional clusters”	Operational Program Development of Eastern Poland 2007-2013, Priority 1.4 “Promotion and cooperation” with Measure 1.4 “Cooperation – cluster creation and development”
Term of the program	2005-2010	2007-2013	Since 2006	2007-2013	2009-2015
Budget	EUR 6.8 million	n. a.	EUR 180 million p.a.	EUR 104 million	EUR 11 million
Type of funding	Grant funding and technical assistance	Grant funding	Grant funding and loans	Grant funding	Grant funding
Does the program have a specific technology focus?	No	No	Yes	No	No
Maximum funding period for a project	Three years plus an extension of two years.	One year	Five years	There is no maximum funding period.	There is no maximum funding period.
Is there a maximum amount of funding an applicant can apply for?	EUR 150,000 p.a.	EUR 140,000	There is no maximum amount.	EUR 5 million	There is no maximum amount.
Financing structure of projects	Max. 50 % funding from the program	Max. 50% from the OSKE program	Up to 75% contribution from the SHOK program for the establishment of the centres and research carried out by them.	Up to 100% funding from the program	Up to 75% funding from the program.

	Regional Growth Agreements (Vaxtarsamningur)	Strategic Research Program for Centres of Excellence and Research Clusters	Grappe d'entreprises	Zentrales Innovationsprogramm Mittelstand – Netzwerkprojekte (ZIM NEMO)	Cluster Offensive Bayern	Corallia – Hellenic Technology Clusters Initiative (Aid Measure for Microelectronics and Embedded Systems)
Term of the program	2010-2013 (current period)	2009-2015	2009, no date of termination	2008-2013	Since 2006	2008-2013
Budget	EUR 3.8 million	EUR 6.8 million	EUR 24 million	EUR 52.2 million	EUR 7 million p.a.	EUR 33 million
Type of funding	Grant funding	Grant funding	Grant funding	Grant funding	Grant funding and technical assistance	Grant funding
Does the program have a specific technology focus?	No	No	No	No	No	Yes
Maximum funding period for a project	There is no maximum funding period.	Seven years	Three years	Four years	There is no maximum funding period.	There is no maximum funding period.
Is there a maximum amount of funding an applicant can apply for?	There is no maximum amount of funding.	EUR 3.4 million	EUR 500,000	EUR 350,000	There is no maximum amount.	There is no maximum amount.
Financing structure of projects	Max. 50 % funding from the program	Max. 25% funding from the program	Max. 25% funding from the program	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 decreased in three steps in the course of the project duration when the network concept is implemented (70% → 50% → 30%).	Max. 75 % funding from the program, share will be decreased in the course of implementation as clusters are expected to increase the share of private co-financing in the course of time	Max. 75 % funding from the program

3.3 Key Findings

The benchmarking of cluster programs has yielded seven 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.

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

Table 14: Overview of key findings

3.3.1 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:

- ***1) 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"¹⁸ that do not have to be congruent with administrative regions and their borders. In this context the rationale of developing regional systems of innovation¹⁹ is explicitly stressed by some programs (the Swedish Vinnväxt and Regional Cluster Program of Tillväxtverket).

¹⁸ 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 sub-division 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).

¹⁹ 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 compet-

- **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 centres 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 benchmarking can be structured according to the different categories of programs as follows:

Type of cluster program	Name and country of cluster program
Cluster programs that focus on regional economic development	<ul style="list-style-type: none"> • Cluster Offensive Bayern (Germany) • Cluster Strategy of Hamburg (Germany) • Vinnväxt (Sweden) • Regional Cluster Program of Tillväxtverket (Sweden) • Arena (Norway) • Polish Cluster Support (Poland) • Regional Growth Agreements (Vaxtarsamningur) (Iceland)
Cluster programs that focus on the	<ul style="list-style-type: none"> • Innovation Networks Denmark

tiveness (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).

development of national industries	<ul style="list-style-type: none"> • OSKE – Centre of Expertise Program (Finland) • Competence Networks Germany • Norwegian Centres of Expertise (Norway) • Corallia – Hellenic Technology Cluster Initiative (Greece) • Polish Cluster Support (Poland) • Grappe d’entreprises (France)
Cluster programs that focus on the commercial exploitation of the R&D potential of a country’s economy	<ul style="list-style-type: none"> • Strategic Research Program for Centres of Excellence and Research Clusters (Iceland) • Strategic Centres of Excellence (SHOK) (Finland)
Network programs to support the competitiveness of national industries	<ul style="list-style-type: none"> • Zentrales Innovationsprogramm Mittelstand - Netzwerkprojekte (ZIM-NEMO) (Germany)

Table 15: Different categories of cluster programs

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 Competence Networks Germany are supported by different regional cluster programs of the Federal States in Germany. Furthermore, many members of Competence Networks Germany 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).²⁰ Some clusters of Competence Networks Germany 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.²¹ 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 Competence Networks Germany 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).

²⁰ 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.

²¹ Four out of the ten current Spitzencluster are member of Kompetenznetze Deutschland. For more information about the Spitzencluster-Wettbewerb (Leading-edge cluster competition) please see www.bmbf.de/en/10726.php.

- 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 Grappe d'entreprises-clusters with links to Pôle de compétitivité-clusters.

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.

3.3.2 Most Cluster Programs Feature High on the Government's Agenda

Asked how important their program features in the overall national or regional policy context²² 9 out of 15 program officials 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.

The two Swedish programs are a very good example for this: The Regional Cluster Program of Tillväxtverket was set up to coordinate the regional strategies for cluster development, innovation and sustainable growth. A similar finding is valid for the Swedish Vinnväxt program that was set up to promote sustainable development in regions by developing internationally competitive research and innovation environments within specific growth fields.

However, a small budget as in the case of the Vinnväxt program and Regional Cluster Program, the Icelandic Strategic Research Program for Centres of Excellence and Research Clusters or the Bavarian Cluster Offensive sets limits in terms of numbers and size of clusters that can be supported and thus in terms of impact on economic development; or as one of the interviewees put it: “You are not able to move mountains with a small budget in your cluster program.”

²² 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.

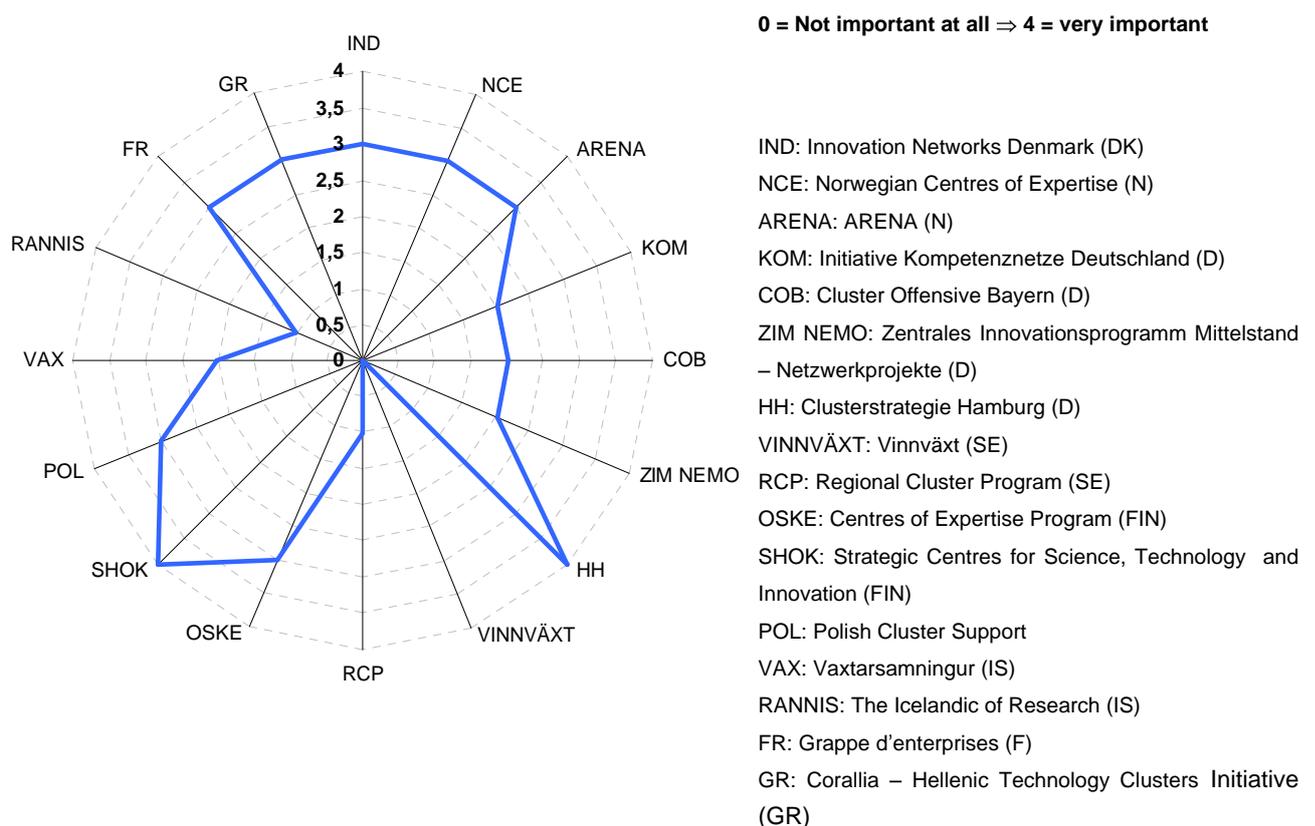


Figure 20: How important is the cluster program in relation to the overall national or regional economic/industrial development strategy?

3.3.3 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 national R&D programs than 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 detail²³, 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, busi-

²³ To give two examples: A program such as the Regional Cluster Program of Tillväxtverket that focuses predominantly on business-driven regional economic development might not necessarily have to be well coordinated with R&D support programs. In the design of e.g. the VINNVÄXT-program the coordination with other national and regional programs promoting innovation and growth was intended to take place in the implementation of the program and not in the process of program formulation. Thus, the evaluation of the applications favored cluster initiatives with strong connections to other national initiatives, for instance centres of excellence or other types of R&D or business development funding. The cluster initiatives are also expected to co-ordinate their activities with other national or regional initiatives. This explains the low score for VINNVÄXT in the figures.

ness 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.

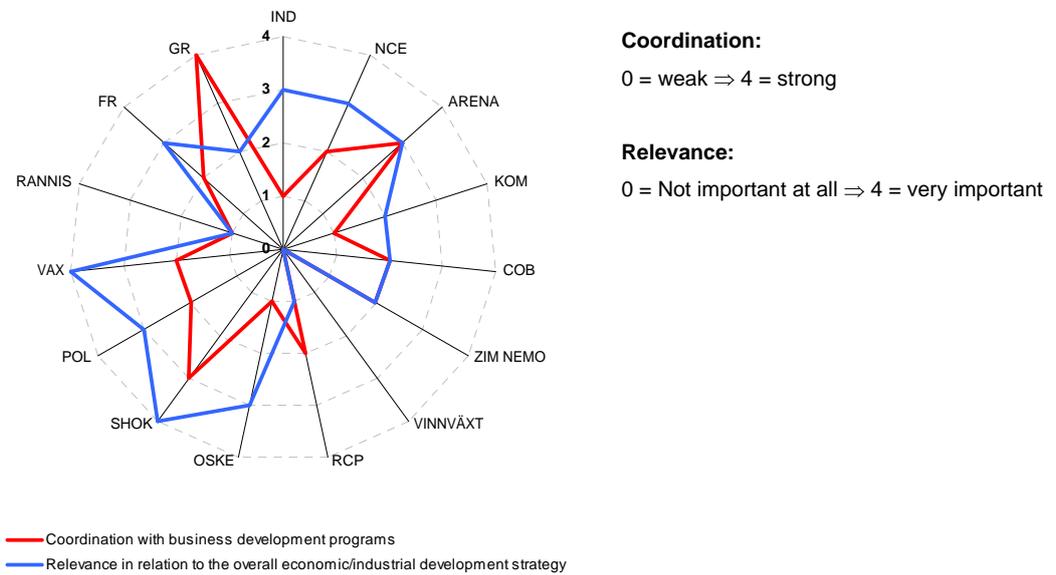


Figure 21: Coordination of cluster programs with other national business development programs

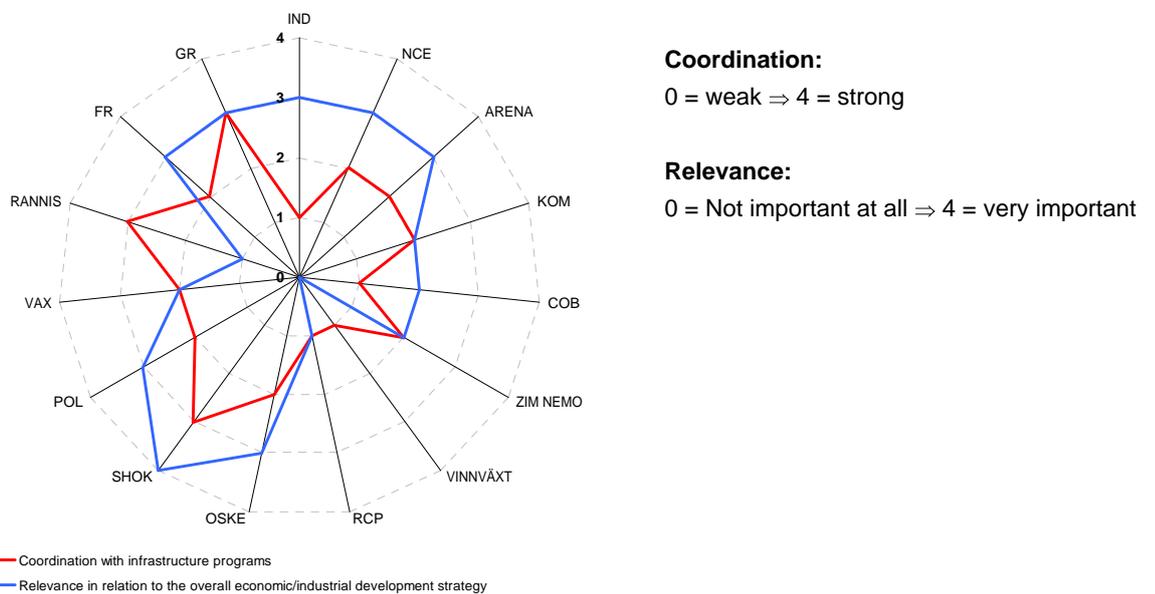


Figure 22: Coordination of cluster programs with national infrastructure programs (e.g. support of universities and other educational institutions)

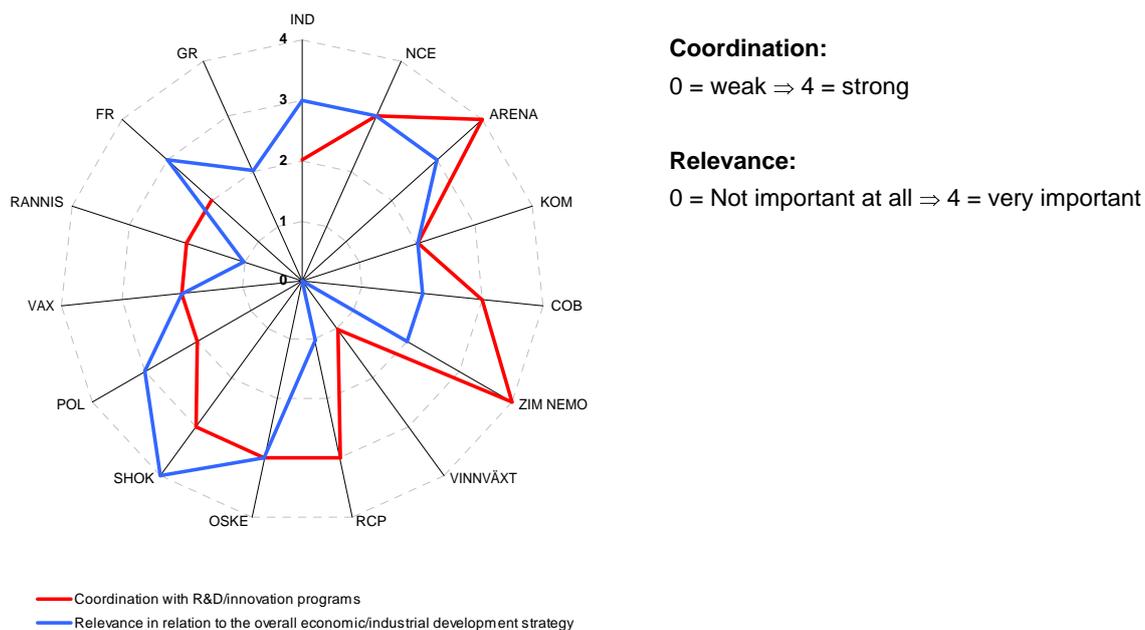


Figure 23: Coordination of cluster programs with other national R&D/innovation support programs

3.3.4 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 be 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 in terms of the relevance attached to the support of international activities. They were asked to indicate on a scale from 0 to 4 how prominent the support of internationalization features in their program:

Relevance	Name of the program
High (3 to 4)	Norwegian Centres of Expertise
	Polish Cluster Support
	Grappe d’entreprises (France)
	Cluster Offensive Bayern (Bavarian Cluster Initiative)
	Competence Networks Germany

Medium (2)	Innovation Networks Denmark
	Vinnväxt (Sweden)
	Regional Cluster Program of Tillväxtverket (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)
Low (1)	ZIM NEMO – Zentrales Innovationsprogramm Mittelstand - Netzwerkprojekte
Not at all (0)	--

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

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

Name of the program	Instruments to support internationalization activities of clusters				
	Training	Funding	Matchmaking and study trips	Support through export promotion agencies or other offices abroad	Cooperation with other funding initiatives
Norwegian Centres of Expertise	X		X	X	
Polish Cluster Support	X	X	X		
Cluster Offensive Bayern (Bavarian Cluster Initiative)	X	X	X	X	
Competence Networks Germany	X		X		X
Innovation Networks Denmark	X	X	X	X	
Vinnväxt (Sweden)			X	X	
Regional Cluster Program of Tillväxtverket (Sweden)			X	X	
ARENA (Norway)				X	
OSKE – Centre of Expertise Program Finland				X	

Regional Growth Agreements (Vaxtar-samningur) (Iceland)			X	X	
ZIM NEMO – Zentra-les Innovationspro-gramm Mittelstand - Netzwerkprojekte			X		

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

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

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 Centres of Expertise and Competence Networks Germany:

- Based on an international strategy the Norwegian Centres 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 Competence Networks Germany is based on an international strategy: The program shall support the global marketing of the “Innovation Hub Germany” (Innovationsstandort Deutschland) through networking between industry and research to develop internationally visible clusters. The program does not provide grant funding to cluster managements, but supports the exchange of experiences between clusters and the development of cluster management services and strategies through technical assistance offered by a dedicated management agency. With regard to the support of cluster internationalization this includes specific workshops and working groups (e.g. just recently in April 2011 a workshop on collaboration with partners from emerging economies was organized), but also networking events with clusters from other countries; e.g. in October 2010 Competence Networks Germany and the Norwegian Centres of Expertise program hosted a joint workshop on internationalization activities for clusters from the two programs. The program also cooperates with other funding initiatives that are supporting internationalization of companies, e.g. with the Energy Efficiency Export Initiative of the Federal Ministry of Economics and Technology.

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 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 Swedish Regional Cluster Program of Tillväxtverket 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 and Tillväxtverket 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 recent survey of international activities of clusters.²⁴ The survey analyzed clusters from different European countries including clusters that are supported in the programs Competence Networks Germany, 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

²⁴ 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

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.

3.3.5 Program Owners Take over a More Active Role towards Developing Individual Clusters

The majority of the interviewed program owners 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 programs Vinnväxt and Tillväxtverket, the Norwegian programs Norwegian Centres of Expertise and ARENA, the German Initiative Competence Networks 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, the Regional Cluster Program of Tillväxtverket, Norwegian Centres of Expertise and ARENA, Cluster Offensive Bayern, Competence Networks Germany 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 Competence Networks Germany.
- Competence Networks Germany also offers 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 is out of the ordinary compared to other cluster programs as it does 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 fora, 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, the Finnish OSKE – Centres of Expertise Program and the Swedish Regional Cluster Program of Tillväxtverket) are typical instruments to facilitate inter-cluster cooperation for the benefit of cross-fertilization.

3.3.6 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. But only a few programs are involved in developing such cluster excellence labels: Competence Networks Germany and Innovation Norway (as the program management agency of the Norwegian Centres of Expertise and ARENA programs) participate 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.²⁵
- 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, 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. 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.

3.3.7 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 officials consider evaluations as useful tools to improve the governance of a program and its effectiveness and efficiency. In this context many program officials 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 of collaboration projects, usage of services (e.g. matchmaking)

²⁵ 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.

offered by the cluster managements, etc.²⁶ 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).²⁷

All programs, except the French program Grappe d'entreprises for which indicators are currently developed, have an indicator system in place to measure the performance of the program in terms of output, results and impact. The indicator systems differ between the programs in terms of the numbers of indicators that are used as well as in terms of comprehensiveness of the indicator set. There is no one-and-only indicator system that is characteristic for a cluster program as indicators always depend on the objectives of a specific program. Thus, which indicators are used and how they are measured depends on the individual program.

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.

²⁶ Danish Agency for Science, Technology and Innovation, 2011: Innovation Network Denmark. Performance Accounts 2011, Innovation: Analyse og evaluierung 08/2011

²⁷ 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

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 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.

Benchmarking has been used by Competence Networks Germany already since 2008 to support cluster organizations in their development. This approach, which formed the foundation of the cluster benchmarking exercise in the context 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.

3.4 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).

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 18: Lessons learned with regard to the program strategy

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

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

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 on-going or upcoming elections may have an impact on the program configuration.

3.5 Main Elements of a Perfect Cluster Program

The European Cluster Policy Group recommended three core principles with respect to the role of cluster programs in the overall policy mix and the nature of cluster programs. While the third principle called for the deliverance of cluster programs in an integrated policy framework that features a clear assignment of roles and responsibilities both for the European Commission and the EU Member States, the two other principles address the relevance that cluster programs should have in the overall policy context and the target group of cluster programs.

Further to the European Cluster Policy Group “cluster programs need to be integrated into the broader context of economic policy, in particular with efforts to improve framework conditions. Stronger framework conditions support the emergence and growth of clusters, and thus increase the returns from cluster programs. [...] Cluster programs are not a substitute to upgrading framework conditions, but a complement that delivers its full value only if structural reforms are pursued in parallel”.²⁸ The European Cluster Policy Group also concluded that “cluster programs will have the highest return, if they target at clusters that show the strongest ability and willingness to renew and upgrade. [...] The EU and the Member States need to reorient their cluster programs away from capacity building and compensating for poor economic performance. Instead, they need to move towards identifying those clusters and cluster-based activities where government engagement will create the largest improvements”.²⁹

Asked how a perfect cluster program should look like from their personal perspective program officials responded with a comprehensive catalogue of ideas that are in line with the recommendations of the European Cluster Policy Group. Summarized in four broader categories (overall strategic set up, target group, instruments and implementation) the following principle outline of a perfect cluster program can be developed from the responses:

- I. With regard to the **overall strategic set up** a cluster program should be based on eight key principles:
 1. The program should be aligned with overall economic and innovation policy priorities.
 2. A cluster program should have a long-term perspective of at least 5 years and be based on the long-term commitment of relevant political stakeholders.
 3. Clusters should be utilized to develop economic sectors that are relevant for the future development of the national economy. The support of emerging industries, but also the utilization of clusters to address specific challenges in matured industry sectors was mentioned as a rationale.
 4. The development of a cluster program should follow a bottom-up approach to accommodate the development needs of industry.
 5. Knowledge-based growth and commercialization of R&D results has to be the primary focus of a cluster program.

²⁸ European Cluster Policy Group, 2010: Final Recommendations – A Call for Policy Action, p. 5

²⁹ Ibid., p. 6

6. Internationalization of clusters should be an integral part of the program strategy in order to support the global competitiveness of the national economy.
 7. Support should focus on cluster excellence and depend on the performance of the cluster.
 8. Ideally, there should be just one cluster program: Less is more – fewer programs would translate into less coordination and in turn into increased efficiency and effectiveness, which is of particular importance in times of tight public budgets.
- II. The **target group of a cluster program** should be the national cluster champions and in particular the cluster management organizations.
- III. When it comes to the **instruments of a cluster program** it was stated that direct financial support through grants is not sufficient to promote the development of excellent clusters. Clusters, in particular cluster management organizations, require also hands-on support through capacity development. Workshops, seminars, tool boxes and networking between clusters (both to exchange best practice and to promote cross-fertilization) that are tailor-made to the needs of cluster management organizations are important instruments to facilitate the development of world-class organizations capable of taking their cluster members further in the global competition. Instruments such as labeling and benchmarking are also considered by program officials as important tools to support cluster development. Support should always go in hand with a review of the cluster performance.
- IV. The nature of **implementation of a cluster program** has an impact on the performance of clusters. Five key aspects should be considered when setting up a cluster program:
1. Program officials indicated that a program has to be smart and simple in order to avoid administrative burdens for cluster organizations that may have an impact on the performance of their daily operations.
 2. Program requirements and processes should not only be less bureaucratic, but also flexible enough to respond quickly to changing economic and technological environments in which clusters are operating.
 3. Program implementation should be supported by a knowledge-based support infrastructure including the program agency and specialized partners such as universities and consultants in order to assist clusters with their specific needs in an adequate manner.
 4. From the very beginning the program should be based on clear targets that can be measured through a purposeful indicator system that provides information that is relevant to the implementation processes. However, many program officials indicated that this is one of the bigger challenges when setting up a program.
 5. The implementation of a program should be accompanied by a formative evaluation which provides recommendations for program adaptation on a continuous basis. Most of the program officials did not consider an ex-post evaluation as useful to improve the performance of a program because the results are only available after the termination of the program and therefore can only be used to develop new programs.

This outline of an ideal cluster program reflects the interest of program officials to take cluster support programs to the next level. Clear ideas – which are in line with the recommendations of the

European Cluster Policy Group - are on the table and have been already realized in some of the programs.

The benchmarking of the different cluster programs revealed many starting points for learning from each other. Just to give a couple of examples:

- The Norwegian Centres of Expertise Program and the Swedish Vinnväxt program are good examples of how to combine a long-term support perspective with performance-based funding;
- With its “Early-Stage Innovation Systems” subprogram of 2008 Vinnväxt also provides best practice on how to support embryonic innovation systems from which new industries can emerge;
- Competence Networks Germany is a best-practice example of a program that provides a comprehensive set of tailor-made services for cluster management development instead of funding;
- The Polish cluster support scheme as well as the Danish, Norwegian and Swedish programs provides examples how grant funding for the establishment of cluster management organizations is coordinated with a range of technical assistance instruments such as training for cluster managers and benchmarking exercises.

Which of those ideas can be implemented in the different countries depends on the national policy context. However, as there was a broad consensus of the program owners with regard to the above described elements of a perfect cluster programs the chances of implementation are promising.

4 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 143 cluster management organizations from Austria, Denmark, Finland, Germany, Iceland, Norway, Poland and Sweden.

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 favorable framework 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 16 cluster programs from Denmark, Finland, France, Germany, Greece, Iceland, Norway, Poland and Sweden demonstrate that there are many good cluster programs in the Member States of the European Union. All these programs support the above briefly sketched objectives forward looking cluster programs should have. However, there is 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.

The following eight policy recommendations are based on the findings of the cluster and cluster program benchmarking. They provide guidance for future developments of cluster programs and shall contribute to the evolution of outstanding “world class” 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 programs that target different types of clusters. With a limited number of cluster 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 labor 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 framework condi-

tions 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 grant funding of cluster management organizations is less important than supporting those through targeted, need-focused services such as relevant workshops and seminars, benchmarking as well as a continuous strategic dialogue to question and further develop strategies and activities. Labeling 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. **Technical assistance instruments are important for the promotion of international activities of clusters.** Although public financial support is certainly useful to support international projects of cluster management organizations and/or cluster members, it is not the financial assistance that matters in the first place, but rather the availability of technical assistance, e.g. through workshops and trainings to support strategy development and competencies such as language or cross-cultural skills. Further support in this regard can be also provided through national export promotion agencies.
8. **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 internationalizing 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.

The Authors



Thomas Lämmer-Gamp is a consultant at the international technology cooperation and cluster policy department of VDI/VDE Innovation + Technik GmbH in Berlin, Germany. Being an expert for the development and implementation of public funding programs, he has been working with regional and economic development policy topics for more than twelve years. Thomas has gathered his experience at two international consultancy companies and the Saxonian State Ministry of Economic Affairs and Labor (German Federal State Government). Prior to his current engagement he served for two years as a technical advisor for international cooperation at the Department of Science and Technology of the Republic of South Africa. Thomas holds a Master's degree in political science, law and sociology from the University of Göttingen and is a PhD fellow at Freie Universität Berlin.

Email: tlg@vdivde-it.de



Dr. Gerd Meier zu Köcker earned his PhD in material science in 1995 and took over the Department for International Technology Transfer within the Federal Institute for Material Research and Testing (BAM). Since 1999 he has been working for VDI/VDE Innovation + Technik GmbH remaining active in the same field. As the Director of the Agency Competence Networks Germany he is responsible for the management of the Initiative on behalf of the Federal Ministry of Economics and Technology (BMWi). In 2007 he became also Director of the Institute for Innovation and Technology in Berlin (IIT Berlin). He is member of different cluster advisory groups and of the European Cluster Policy Group. He has been involved in various innovation, competitiveness and international technology transfer projects.

Email: mzk@vdivde-it.de



Dr. Thomas Alslev Christensen has been working as Head of the Department for Innovation Policy at the Danish Ministry for Science, Technology and Innovation since 2005. He is head of the secretariat of The Danish Council for Technology and Innovation and responsible for Danish innovation policy programs such as the Innovation Networks Denmark Program, the Danish Program for Innovation Projects, the Danish Industrial PhD Program, the Danish Incubator Program and the Danish GTS-system (Danish RTO institutes). Thomas has previously worked at the Nordic Council of Ministers, the Ministry of Economic Affairs and the Prime Minister's Office. He has also been external associate professor at the University of Copenhagen. He holds a Master's degree in economics from the University of Copenhagen and a PhD degree in international economics from Copenhagen Business School.

Email: tac@fi.dk

APPENDIX: Description of Cluster Programs

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1 Introduction

The benchmarking of cluster programs in the context of the project “NGPExcellence – Cluster Excellence in the Nordic Countries, Germany and Poland” covered 16 programs from Denmark, Germany, Norway, Sweden, Finland, Iceland, Poland, France and Greece. While different in terms of rationales, objectives and instruments all these programs have the support of clusters through the establishment and/or development of cluster management organizations in common.

General characteristics of these programs and key findings from the benchmarking are presented in chapter “3. Results of the Benchmarking of Cluster Programs” of this report. The appendix gives a more detailed overview of each program in terms of

- Objectives and rationale;
- Target group;
- Term of the program, financial aspects and application procedure;
- Instruments;
- Results and impact;
- Monitoring and evaluation system;
- Context.

The information was collected through an online survey for program officials (in November-December 2010), telephone interviews with program officials (March-April 2011) and the analysis of program guidelines and evaluation reports that were provided by program officials.

2 Overview of Cluster Programs

2.1 Denmark

2.1.1 Innovationsnetværk Danmark (Innovation Networks Denmark)

Name of program	Innovationsnetværk Danmark (Innovation Networks Denmark)
Country	Denmark
Contact details	Danish Agency for Science, Technology and Innovation (DASTI) Thomas Alslev Christensen, PhD Head of Division Bredgade 40 DK-1260 Copenhagen Tel.: +45 33 92 93 73 Email: tac@fi.de
Internet	www.innovationsnetvaerk.dk

2.1.1.1 Objectives and Rationale of the Program

Innovation Networks are a key instrument in supporting private sector research and development activities in order to ensure that Danish companies and public institutions are among the most innovative in the world. In this context Innovation Networks serve **two overall objectives**:

- 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.

In order to meet these overall objectives the following **operational objectives** have to be fulfilled by Innovation Networks:

- Establishing environments for knowledge development and knowledge sharing between companies, knowledge institutions and other relevant players, which can strengthen innovation and growth in areas that show commercial growth and development potential.
- Establishing effective matchmaker functions that can serve as an easy way for companies to gain access to research and knowledge in a specific professional area from a range of existing knowledge institutions.
- Creating permanent cooperation between companies and knowledge institutions and any other relevant partners (for example in the public sector) in order to increase the use of research-based knowledge in business and industry.

- To a greater extent coordinating and designing the knowledge institutions' research and education in line with the needs of business and industry.
- Bringing relevant knowledge from abroad to Denmark.

2.1.1.2 Target Group of the Program

There are two primary target groups for innovation networks:

- Companies within the network's focus area, especially small and medium-sized enterprises.
- Research and knowledge institutions and technological intermediaries that operate within the network's focus area. Vocational university colleges and other educational establishments will also be able to join networks.

The secondary target group is national or regional business promotion players, the regional authorities, municipalities, industry organizations, professional organizations, etc. that can contribute to supporting the development in the primary target group.

It is up to each innovation network to define the exact target group for the network. The target group must have critical mass in terms of the number of companies.

2.1.1.3 Term of the Program, Financial Aspects and Application Procedure

Term of the program	Year of inception: 2005, no date of termination
Budget	EUR 10 million p.a.
Type of funding	Grant funding and technical assistance
Does the program have a specific technology focus?	No
Are there calls for proposals?	Yes, once every second year. Calls do not have a specific thematic focus.
Is there a dialogue with applicants about the improvement of their application prior to the final submission of the application?	Yes
Maximum funding period for a project	<ul style="list-style-type: none"> • Innovation Networks may receive funding for up to four years. Funding is granted initially for two years. Funding for further two years depends on a positive evaluation. • After four years an Innovation Network can apply for the continuation of funding from the program; but this will be in competition with other Innovation Networks or proposals from new applicants.
Is there a maximum amount of funding an applicant can apply for?	No

Financing structure of projects	<ul style="list-style-type: none"> • Max. 50 % national government co-financing (Innovation Network Denmark) • Min. 40% private sector co-financing • Other co-financing, e.g. from other public sources (local, regional or EU)
Most important evaluation criteria for project proposals	<ul style="list-style-type: none"> • Impact on industry sector and companies • SME focus/SME participation in activities • Knowledge and/or technology transfer • Budget (incl. share of private co-financing) • Structure and members of consortia

2.1.1.4 Instruments

Beside grant funding that is intended for the establishment and management of the Innovation Network and to carry out network activities the Danish Agency for Science, Technology and Innovation has set up a dedicated agency, NETMATCH that is expected to support the further development of the individual Innovation Networks.

The **grant funding** is provided for

- The establishment and management of a secretariat of the Innovation Network. Activities that can be supported in this context include i.a. preparation of strategies and analysis within the focus area of the network, networking activities and public relations.
- Matchmaking and knowledge dissemination activities, including i.a. identification of cooperation partners, conferences, seminars and other events, advice on public innovation support programs and preparation of application.
- Development projects. Within the framework of the innovation network a number of concrete cooperation or development projects can be established. The projects must focus on strengthening innovation and growth potential in the target group for the innovation network, and on strengthening the companies' interaction and exchange of knowledge with research and knowledge institutions.

With the establishment of **NETMATCH** (www.netmatch.nu) by the Danish Agency for Science, Technology and Innovation in the beginning of 2010 a dedicated **agency for technical assistance** to the Innovation Networks was created. NETMATCH is expected to develop and provide services for the networks that support their further development. A particular focus of NETMATCH activities lies on supporting the networks as national points of contact within their area of expertise, branding of the Innovation Networks as well as supporting the networks in their international activities.

2.1.1.5 Results and Impact of the Program

Today there are 23 Innovation Networks in a vast array of industry areas, including energy/environment, food, ICT, fashion and design, experience economy/entertainment, production

technology and new materials, health/pharma/biotechnology, transport as well as in cross-disciplinary fields.³⁰

In recent years the number of networks has been actively decreased by the Danish Agency for Science Technology and Innovation from 36 in 2007 to 22 in 2009 in order to increase the size of the networks for the benefit on an increased efficiency.³¹ Program officials reported for 2009 some 3,700 members of the 23 Innovation Networks; including 3,059 SME, a number which has increased by 50 per cent in the period 2007-2009.

The figure below indicates the program performance in terms of the results achieved in 2009 based on an assessment made by program officials. The figure shows a very good performance of the program particularly in regard to the growth of the cluster in membership, new products, services and/or processes, growth of turnover of companies and skills development of cluster members. According to information provided by program officials 114 R&D projects of companies and research institutions were supported by the program in 2009.

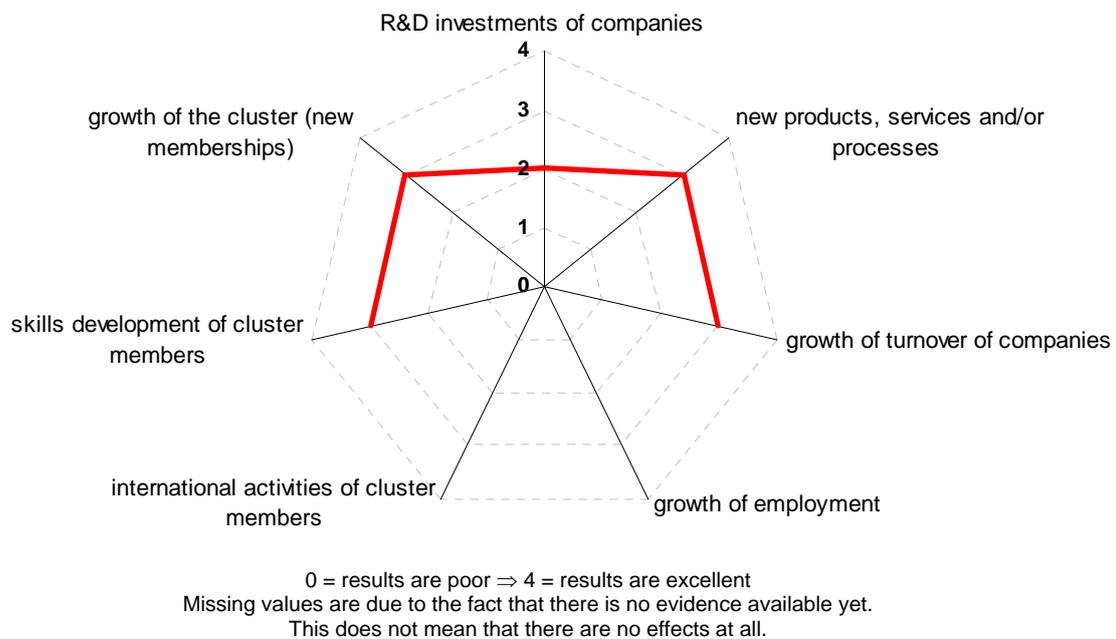


Figure 24: Results of the program that were achieved in 2009

The assessment is backed by the findings of the 2009 Performance Account of the program which report impressive effects on innovation-driven business activities. Public investments of EUR 8 million (DKK 59.6 million) in basic network grants in 2008 triggered an estimated annual increase of sales of EUR 214,517 million (DKK 1.6 billion). Out of 924 companies that participated in partnership projects 408 companies have developed new products and services, 466 companies generated innovation ideas on which they will work in the future and further 632 companies have bene-

³⁰ For a full list of the Danish Innovation Networks please see <http://en.fi.dk/innovation/innovation-networks-denmark/the-danish-innovation-networks-and-clusters.pdf>

³¹ Danish Agency for Science, Technology and Innovation, 2009: Competence Networks in Denmark. Performance Accounts 2009, p. 17

fited from the participation in the Innovation Networks by developing skills or obtaining specific methods or tools which significantly increase their ability to work with innovation.³²

2.1.1.6 Monitoring and evaluation system

Monitoring of the program performance is a key element of the Danish program. A performance report which is based on an elaborated system of indicators³³ is published on an annual basis.

The following main indicators are used to measure the performance of the program:

Indicators	
Output	<ul style="list-style-type: none"> • Numbers of networks • Share of private co-financing • Share of public co-financing • Relevant combination of partners (research institutions, private companies, public partners)
Results	<ul style="list-style-type: none"> • Numbers of collaborative R&D projects • Numbers of participating private companies in networking activities (and share of SME in these) • Numbers of participating private companies in joint R&D projects with research institutions (and share of SME in these) • Numbers of companies that are developed
Impact	<ul style="list-style-type: none"> • Increase in turnover of the participating companies.

Beneficiaries are monitored by means of regular written reports and independent benchmarking exercises.

Independent evaluations of the program are carried out every 5 years.

2.1.1.7 Context of the program

Asked to assess the importance of the program on a scale from 0 (not important at all) to 4 (very important) in relation to the overall economic/industrial development strategy and in relation to other R&D/innovation programs the program authority assigned a 3 to each of the two dimensions (see table below). Being an element of the overall national development strategy the program is an important element of the Danish economic and R&D support policy.

³² Ibid., pp. 23, 28 and 35

³³ Ibid., pp. 64-66

How important is the cluster program in relation to...	0	1	2	3	4
...the overall national economic/industrial development strategy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
...other R&D/innovation programs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>

0 = not important at all ⇒ 4 = very important

Table 20: Relevance of Innovation Networks Denmark in the overall policy setting

Although the program is of high importance in the context of overall policies its coordination with other programs is rather suboptimal. Asked about the coordination of the cluster programs with other support programs of the country program officials indicated that it is rather weak (see figure below).

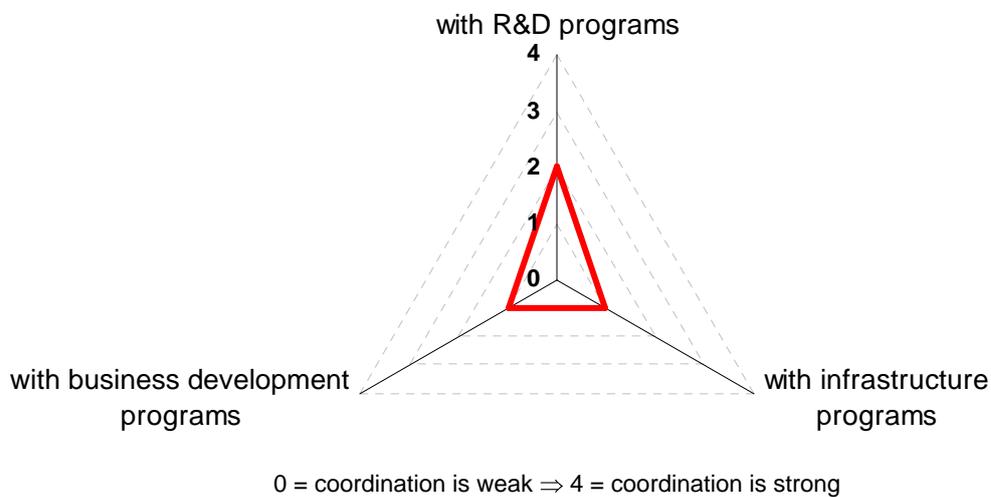


Figure 25: Coordination of Innovation Networks Denmark with other Danish funding programs

2.2 Germany

2.2.1 Initiative Kompetenznetze Deutschland (Competence Networks Germany)

Name of program	Initiative Kompetenznetze Deutschland (Competence Networks Germany)
Country	Germany
Contact details	Management Agency Competence Networks Germany VDI/VDE Innovation + Technik GmbH Dr. Gerd Meier zu Köcker Steinplatz 1 D-10623 Berlin Tel. +49 30 31 00 78 118 Fax +49 30 31 00 78 222 Email: mzk@vdivde-it.de
Internet	www.kompetenznetze.de

2.2.1.1 Objectives and Rationale of the Program

The underlying rationale of the Competence Networks Germany is to create a “League of the best innovation networks of Germany”. Being member of this initiative as a cluster is a quality label. The **overall objective** of the program is to

- Facilitate intensive networking between industry and science to increase the innovation capacity and international competitiveness of German industry;
- Increase international visibility of the clusters and by this market Germany as an international innovation hub.

To put this into practice the Federal Ministry of Economics and Technology (BMWi) has established a dedicated management agency that supports members of the program with tailor-made services. The specific feature of the program is that it does not provide funding or any other kind of financial assistance to clusters or cluster management organizations. Support of clusters and in particular cluster management organizations is provided by the management agency through a wide array of different services and technical assistance measures. They include for example working groups and individual support, workshops and conferences, benchmarking, marketing and public relations and support with internationalization activities. Services and technical assistance measures are offered only to the members of the program and are provided free of charge.

In order to become a member cluster management organizations have to apply for membership. Criteria for membership are history and development momentum of the cluster, a clear thematic focus, degree of institutionalization, tasks and activities of the cluster management organization, composition and interaction of members and degree of internationalization.³⁴ Members can also be

³⁴ For a detailed overview of membership criteria please see www.kompetenznetze.de/initiative/die-aufnahme/aufnahmekriterien_initiativekompetenznetzedeuutschland.pdf

excluded from the program if they do not meet the quality standards. The decision, whether membership is granted or not, is taken once a year by an independent advisory council whose members are appointed by the Federal Ministry of Economics and Technology (BMW). Members are well-respected representatives from industry and research. The advisory council also participates in the strategic development of the program as such.

2.2.1.2 Target Group of the Program

The target group of the program are well-developed and matured clusters represented by a cluster management organization that have a sound potential for innovation and growth.

2.2.1.3 Term of the Program, Financial Aspects and Application Procedure

Term of the program	Since 1997
Budget	EUR 1 million p.a. for the operation of the management agency
Type of funding	Technical assistance
Does the program have a specific technology focus?	No
Are there calls for proposals?	n.a.
Is there a dialogue with applicants about the improvement of their application prior to the final submission of the application?	n.a.
Maximum funding period for a project	n.a. as the program does not support clusters through direct funding
Is there a maximum amount of funding an applicant can apply for?	n.a. as the program does not support clusters through direct funding
Financing structure of projects	n.a. as the program does not support clusters through direct funding
Most important evaluation criteria for project proposals	n.a.

2.2.1.4 Instruments

The program does provide neither grant funding, nor any other kind of financial assistance to clusters or cluster management organizations. It provides only technical assistance for cluster management organizations and cluster members through its management agency. The wide range of technical assistance support includes the following measures:

- Thematic working groups on financing (e.g. service development, controlling), innovation Management (development of a tool box for innovation management), ICT Clusters (international competence atlas), cluster management excellence and quality and impact assessment of clusters in the field of energy and environment. The working groups meet on a regular basis

and respond to the interests expressed by the cluster management organizations. The program is flexible and can set up additional working groups any time.

- Individual support for cluster management organizations, including support with strategy development, advise on restructuring and mergers and cooperation.
- Workshops and conferences on topics such as public relations, further education and training, cluster management excellence, intellectual property rights, sustainability of cluster development or cluster cooperation with emerging economies. Like the working groups workshops and conferences respond to the interests expressed by the cluster management organization.
- International networking with other clusters or relevant stakeholders; recent examples include a joint workshop of Competence Networks Germany with the Norwegian Centres of Expertise on internationalization of clusters, participation in the South Korea – Korean Scientific Cooperation Network with the European Research Area (KORANET), a meeting with an economic delegation from Shanghai, presentations of competence networks at international conferences, cooperation with other funding initiatives, e.g. Energy Efficiency Export Initiative of the Federal Ministry of Economics and Technology, and ad-hoc contact brokering for members of competence networks.
- Benchmarking and quality labeling since 2007. The program is also participates through its management agency in the European Cluster Excellence Initiative.
- Publications and studies, e.g. on cluster management excellence, development of cluster management organizations and internationalization activities.³⁵

2.2.1.5 Results and Impact of the Program

Today there are 97 clusters members of the program. They are represented by their cluster management organizations; through the clusters more than 450 Non-SME and more than 6,000 SME, more than 1,600 R&D institutions and universities and more than 1,000 service providers benefit from the program.

The program has a number of positive effects that contribute to the achievement of the program objectives. An evaluation of the program arrived at the following conclusions:³⁶

- The quality of the cluster management organization's work has improved and has contributed to an improved collaboration between the cluster members through exchange of information and guidance.
- The reputation of individual members and of the cluster as whole improved which translated into a greater visibility and recognition among policy makers and potential partners.

³⁵ For a list or download of publications that are available in English see www.kompetenznetze.de/the-service/order-service.

³⁶ Federal Ministry of Economics and Technology, 2009: Endbericht Evaluation von Konzeption und Wirkungen der BMWi-Initiative "Kompetenznetze Deutschland", pp. 37-41

- Cooperation with other clusters and stakeholders both from Germany and abroad has increased.
- Members of the cluster experienced a boost of their motivation and contribute more actively to the work of the cluster.

2.2.1.6 Context of the program

Although the program is an important cluster program of the Federal Government its relevance in the overall policy context is, according to program officials, rather limited (see Table 21), which also reflects in its coordination with other funding programs (see Figure 26).

How important is the cluster program in relation to...	0	1	2	3	4
...the overall economic/industrial development strategy?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
...other R&D/innovation programs?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>

0 = not important at all ⇒ 4 = very important

Table 21: Relevance of Kompetenznetze Deutschland in the overall policy setting

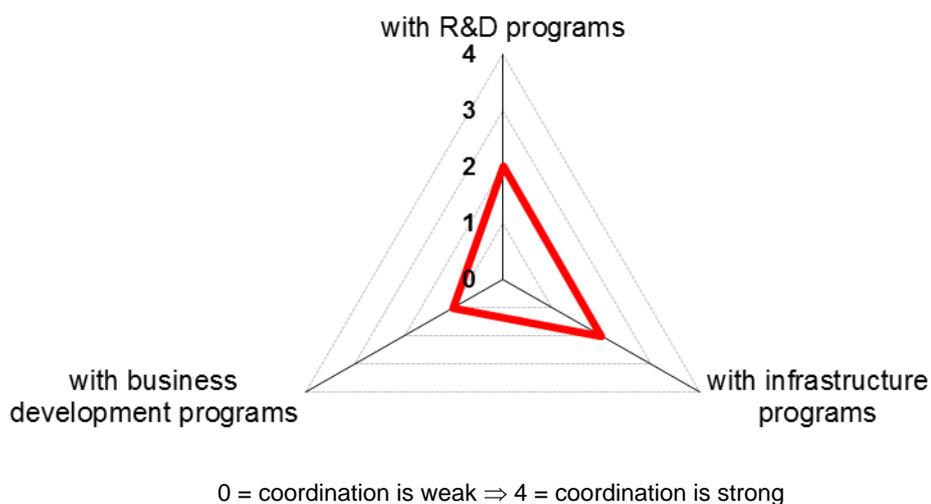


Figure 26: Coordination of Kompetenznetze Deutschland with other funding programs

2.2.2 Zentrales Innovationsprogramm Mittelstand – Fördermodul Netzwerkprojekte (ZIM-NEMO) (Central Innovation Program SME – Funding Module Network Projects (ZIM-NEMO))

Name of program	Zentrales Innovationsprogramm Mittelstand – Fördermodul Netzwerkprojekte (ZIM-NEMO) (Central Innovation Program SME – Funding Module Network Projects (ZIM-NEMO))
Country	Germany
Contact details	Project Agency of the Federal Ministry of Economics and Technology (BMWi) VDI/VDE Innovation + Technik GmbH Ute Bornschein Steinplatz 1 D-10623 Berlin Tel. +49 30 31 00 78 382 Email: bornschein@vdivde-it.de
Internet	www.zim-bmwi.de

2.2.2.1 Objectives and Rationale of the Program

The Zentrale Innovationsprogramm Mittelstand (Central Innovation Program SME) was incepted by the Federal Government in 2008 to cushion the effects of the global economic crisis by supporting SME in their efforts to maintain and develop international competitiveness. As a result of the support SME are expected to increase their near-to-market R&D activities and to commercialize R&D results in a shorter period of time. Furthermore, an increased collaboration between SME and research institutions is also expected as a result of the program.

The program consists of three funding modules, including the support of collaborative projects of SME (ZIM-KOOP), the support of individual projects of SME (ZIM-SOLO) and the support of network projects (ZIM-NEMO). The latter funding module, ZIM-NEMO, will be presented by this chapter in more detail as it supports the development of clusters.

The **overall objective** of ZIM-NEMO is to support the development of innovative networks that consists of at least six companies. In the context of this program networks are defined as contract-based collaboration between companies and institutions that support and complement each other in technology development activities.

2.2.2.2 Target Group of the Program

Target group of the program are SME that collaborate with other SME or research institutions in a network project.

2.2.2.3 Term of the Program, Financial Aspects and Application Procedure

Term of the program	2008-2013
Budget	EUR 52.2 million
Type of funding	Grant funding
Does the program have a specific technology focus?	No
Are there calls for proposals?	Project applications can be submitted at any time
Is there a dialogue with applicants about the improvement of their application prior to the final submission of the application?	Yes
Maximum funding period for a project	Three years
Is there a maximum amount of funding an applicant can apply for?	EUR 350,000
Financing structure of projects	Financial support from the program is declining in the course of the project: in the initial phase the project can be co-funded by public means with up to 90% of eligible costs to develop a network concept, but the share of public funding will be decreased in three steps in the course of the project duration when the network concept is implemented (70% → 50% → 30%).
Most important evaluation criteria for project proposals	<ul style="list-style-type: none"> • Impact on industry sector and companies • SME focus or SME participation in activities • Knowledge and/or technology transfer • Budget (including share of private co-funding) • Structure and members of consortium • Market opportunities for innovation

2.2.2.4 Instruments

ZIM-NEMO provides grant funding for management services that are related to the development of a network concept and for its implementation. The support can be granted for activities such as acquisition of network partners and corresponding contract negotiations, analysis of strengths and weaknesses of network partners, coordination of R&D projects and market research.

R&D projects that are direct result of these activities can be funded under the funding modules ZIM-KOOP and ZIM-SOLO of the Zentrale Innovationsprogramm Mittelstand (Central Innovation Program SME).

2.2.2.5 Results and Impact of the Program

There are no evaluation results available at the moment. Until 2009 50 network organizations have received financial support. They represent a total number of 29 Non-SME, 515 SME, 29 universities, 39 R&D institutions and 18 other stakeholders.

2.2.2.6 Monitoring and evaluation system

The program is evaluated on a regular basis.

The following indicators are used to monitor the performance of the program:

Indicators	
Output	<ul style="list-style-type: none"> • Number of networks • Number of participants • Activities • Work plan • Number of R&D projects • Continuation of the network after funding terminates
Results	<ul style="list-style-type: none"> • Realized work plan • Number of R&D projects which resulted in new products, technical services and processes
Impact	<ul style="list-style-type: none"> • Market position and economic development: <ul style="list-style-type: none"> ○ Increased turnover and profit ○ Increased turnover and export of products that were developed in the course of the project ○ Number of created jobs

Beneficiaries are monitored by regular written reports prepared by the beneficiary.

2.2.2.7 Context of the program

Although the program does not feature high in the overall policy context (see Table 22), its coordination with other R&D programs is excellent (see Figure 27).

How important is the cluster program in relation to...	0	1	2	3	4
...the overall economic/industrial development strategy?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
...other R&D/innovation programs?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>

0 = not important at all ⇒ 4 = very important

Table 22: Relevance of ZIM-NEMO in the overall policy setting

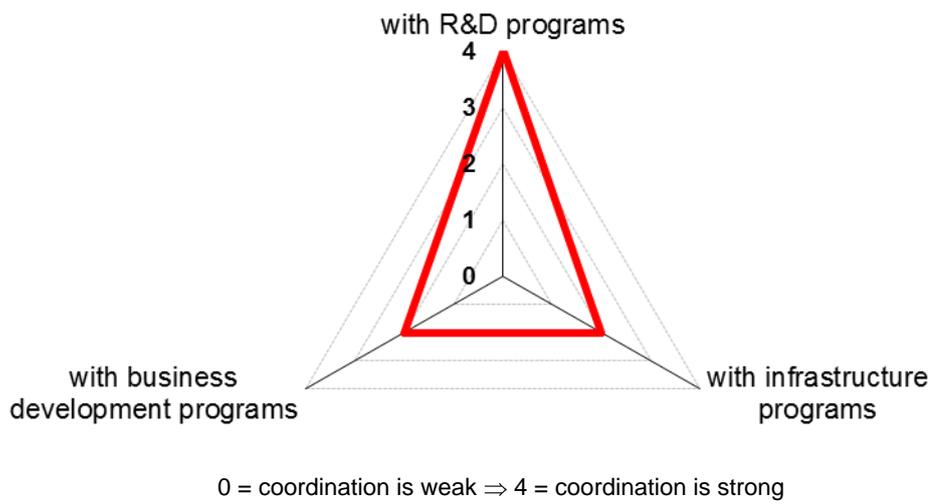


Figure 27: Coordination of ZIM-NEMO with other funding programs

2.2.3 Cluster Offensive Bayern (Bavarian Cluster Initiative)

Name of program	Cluster Offensive Bayern (Bavarian Cluster Initiative)
Country	Germany, Free State of Bavaria (Federal State)
Contact details	Bavarian Ministry for Economic Affairs, Infrastructure, Transport and Technologie Dept. for Cluster Initiatives and Fraunhofer Society Dr. Rolf Bommer Prinzregentenstr. 28 D-80538 München Tel. 0049 89 2162 22 79 Email: rolf.bommer@stmwivt.bayern.de
Internet	www.cluster-bayern.de

2.2.3.1 Objectives and Rationale of the Program

Through the Cluster Offensive Bayern the regional government of the Federal State Free State of Bavaria supports the establishment and development of cluster management organizations in 19 industry fields that are key sectors of the Bavarian economy.

The **overall objective** of the program is support the global competitiveness of the Bavarian economy. This is to be achieved by pursuing the following **operational objectives**:

- Strengthening of the innovation capacity and dynamic through cooperation and improved and faster knowledge and technology transfer between science and industry for the benefit of commercialization of R&D results
- Increased productivity through cooperation and competition
- Strengthening of the attractiveness of the Free State of Bavaria and development of a brand

As a result of a comprehensive survey involving government departments and independent experts 19 industry areas were identified for the establishment of cluster management organizations. These industry areas are clustered in thematic areas and include within

- The thematic area “Mobility”: automotive, railway technology, logistics, aviation and space and satellite navigation;
- The thematic area “Material development”: new materials, chemicals and nanotechnology;
- The thematic area “Human being and environment”: biotechnology, medical engineering, energy technologies, environmental technologies, wood and food;
- The thematic area “ICT and electrical engineering”: ICT, sensor technology, power electronics, mechatronics and automation;

- The thematic area “Services and media”: financial services and media.

Potential organizations for cluster managements were approached by the government in 2005/2006. In 2006 19 cluster organizations were established as a result of this top-down-process. No further cluster organizations have been established since then and it is planned to reduce the number by barring underperforming cluster managements from future funding.

2.2.3.2 Target Group of the Program

Target group of the program are companies that are located in the Free State of Bavaria.

2.2.3.3 Term of the Program, Financial Aspects and Application Procedure

Term of the program	Year of inception: 2006, no date of termination
Budget	EUR 7 million p.a.
Type of funding	Grant funding and technical assistance
Does the program have a specific technology focus?	No
Are there calls for proposals?	There are no calls for proposals.
Is there a dialogue with applicants about the improvement of their application prior to the final submission of the application?	n.a.
Maximum funding period for a project	There is no maximum funding period.
Is there a maximum amount of funding an applicant can apply for?	No
Financing structure of projects	<ul style="list-style-type: none"> • Max. 75 % funding from the program, share will be decreased in the course of implementation as clusters are expected to increase the share of private co-financing in the course of time
Most important evaluation criteria for project proposals	<ul style="list-style-type: none"> • Impact on industry sector and companies • Share of private co-financing • Structure and members of consortium

2.2.3.4 Instruments

The key element of the program is **grant funding** for the operation of a cluster management organization. This includes financial support for staff and material costs as well as travel expenses and events. The program also included a preferential access for clusters to R&D money provided by a special cluster fund.

In addition to the grant funding the program owner is very active in accompanying the development of the individual cluster initiatives through different **technical assistance and advisory** measures. Meetings with cluster managers are held every two months to discuss challenges and progress of the clusters; in addition all cluster managers gather with the program owner for several days at an annual break away. The program owner also relies on external consultancy services, e.g. a workshop on internationalization activities for cluster managers.

2.2.3.5 Results and Impact of the Program

The program is evaluated on a regular basis. An evaluation is currently underway to analyze the performance of the cluster organizations and to provide guidance for the further development of the program until 2015. The mid-term evaluation of 2008 attests a good performance of the program. After two years of support the majority of the cluster organizations had yielded results in terms of the establishment of network structures and improved collaboration between industry stakeholders. The clusters played also an important role for the local respectively regional economic development.³⁷

According to the program owners the program shows good results in terms of the growth of the clusters (which reflects their attractiveness for economic and research players), new products, services and/or processes as well as growth of turnover of companies (see figure below).

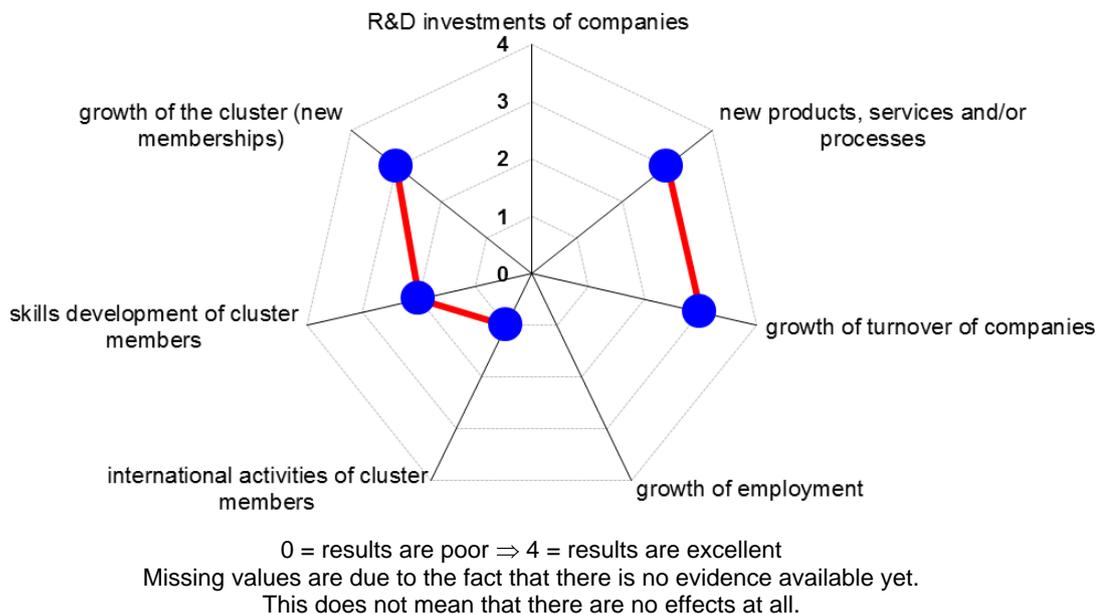


Figure 28: Results of the program that were achieved in 2009

³⁷ Fraunhofer Institut für System- und Innovationsforschung, 2008: Zwischen-Evaluation der Cluster-Offensive Bayern. Abschlussbericht Dezember 2008

2.2.3.6 Monitoring and evaluation system

The program is evaluated by independent consultants on a regular basis. A mid-term evaluation was carried out in 2008, followed by an evaluation in 2011.

The following indicators are used to monitor the performance of the program:

Indicators	
Output	<ul style="list-style-type: none"> • Number of members • Number of conferences and participants • Number of projects, participants and project volume • Acquired federal and EU funds • Number of meetings with members • Website visits
Results	<ul style="list-style-type: none"> • Share of self-financing • Success stories
Impact	<ul style="list-style-type: none"> • --

Beneficiaries are monitored by regular written reports prepared by the beneficiary, IT-based monitoring through the program owner, regular independent evaluations and benchmarking exercises.

2.2.3.7 Context of the program

The program is part of the innovation policy strategy of the regional government of the Free State of Bavaria. However, program officials assessed its relevance rather as average due to the relatively small budget of the program compared to its scope and duration.

How important is the cluster program in relation to...	0	1	2	3	4
...the overall economic/industrial development strategy?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
...other R&D/innovation programs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>

0 = not important at all ⇒ 4 = very important

Table 23: Relevance of Cluster Offensive Bayern in the overall policy setting

Asked about the coordination of the program with other funding programs program officials reported a good coordination with other R&D and business development programs, while the coordination with infrastructure programs was assessed as rather weak.

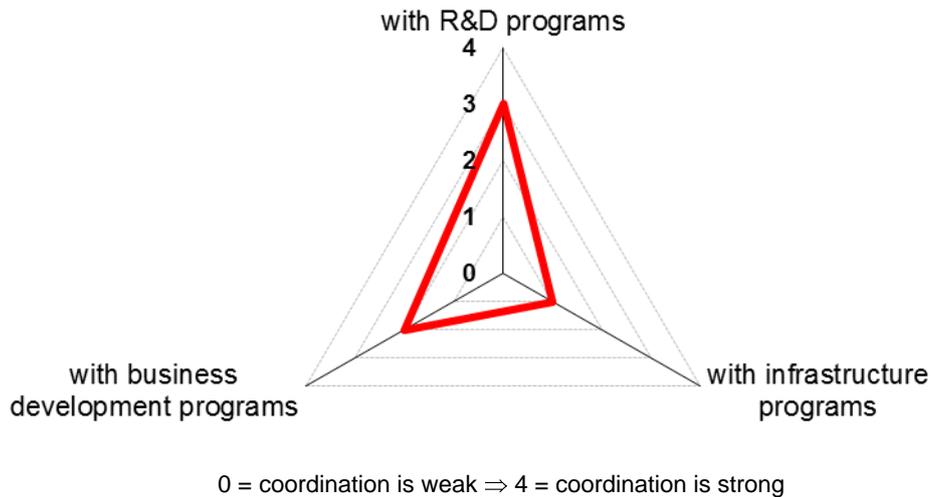


Figure 29: Coordination of Cluster Offensive Bayern with other funding programs

2.2.4 Cluster Policy Strategy of the Free and Hanseatic City of Hamburg (Germany)

Name of program	Clusterpolitische Gesamtstrategie (Cluster Policy Strategy)
Country	Germany, Free and Hanseatic City of Hamburg (Federal State)
Contact details	Behörde für Wirtschaft, Verkehr und Innovation der Freien und Hansestadt Hamburg (Ministry of Economics, Transport and Innovation) Stabsstelle Clusterpolitik (Staff Unit Cluster Policy) Gönke Tetens Alter Steinweg 4 20459 Hamburg Tel: +49 40 428 41 1429 Email: goenke.tetens@bwvi.hamburg.de
Internet	www.hamburg.de/cluster

The foundation for The Free and Hanseatic City of Hamburg’s cluster policy strategy was laid in 2002 in the overall concept of economic development “Metropole Hamburg – Wachsende Stadt” (Metropolis of Hamburg – A Developing City). This long-term concept calls for the further development of those cluster initiatives which were already established in 1997 (cluster initiative “IT and Media”) and in 2001 (cluster initiative “Aerospace”) as public-private-partnerships of the city’s government and stakeholders from the science sector and industry. The Life Science and Logistics cluster initiatives were founded in 2004 respectively 2006. As a result of the further development of the overall concept of economic development in 2008 (new title: “Hamburg. Wachsen mit Weitsicht” (Hamburg. Growth with Foresight), further cluster initiatives were established in 2009 (Health Care industry), 2010 (Creative Industries and Renewable Energies) and 2011 (Maritime Industries). All eight cluster initiatives are public-private-partnerships and are focused on industries - both traditional (such as maritime and aerospace) and new (such as creative industries) - that are considered to be key industrial sectors for the future economic development of the city of Hamburg.

In April 2010 the Senate (cabinet) of the Free and Hanseatic City of Hamburg approved the “Clusterpolitische Gesamtstrategie” (Cluster Policy Strategy) to utilize cluster initiatives for economic

development even more. To achieve the overall objective of the strategy - medium and long term support of economic growth and employment - the strategy consists of six elements that are displayed in the figure below:

Cluster Policy Strategy					
Guidelines for cluster initiatives	Standardized evaluation system	Further development of the cluster initiative portfolio	General cluster policy public relations	Cross-cluster networks	Cross-cluster projects

Source: Behörde für Wirtschaft, Verkehr und Innovation, 2011

Figure 30: Elements of the cluster policy strategy

According to responsible government officials, cluster policy is a very important element both in the context of the overall economic development strategy of the City of Hamburg and with regard to the existing R&D and innovation programs (see table 8 below).

How important is the cluster program in relation to...	0	1	2	3	4
...the overall regional economic/industrial development strategy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
...other R&D/innovation programs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

0 = not important at all ⇒ 4 = very important

Table 24: Relevance of the cluster policy strategy in the overall policy setting

Responsibility for cluster policy is shared between different government ministries within the Free and Hanseatic City of Hamburg (see figure below). While technical steering and financing of the cluster initiatives lies with various government ministries, overall coordination of cluster policy is the responsibility of the Staff Unit Cluster Policy within the Ministry of Economics, Transport and Innovation. To coordinate activities and facilitate best-practice sharing between the different government departments and cluster initiatives, a working group was established in 2010, chaired by the Staff Unit Cluster Policy of the Ministry of Economics, Transport and Innovation. The working group focuses in particular on thematic issues such as R&D and innovation, training and education, internationalization and strategy and controlling. It further coordinates inter cluster-projects to facilitate cross-fertilization for the development of new innovations and markets.

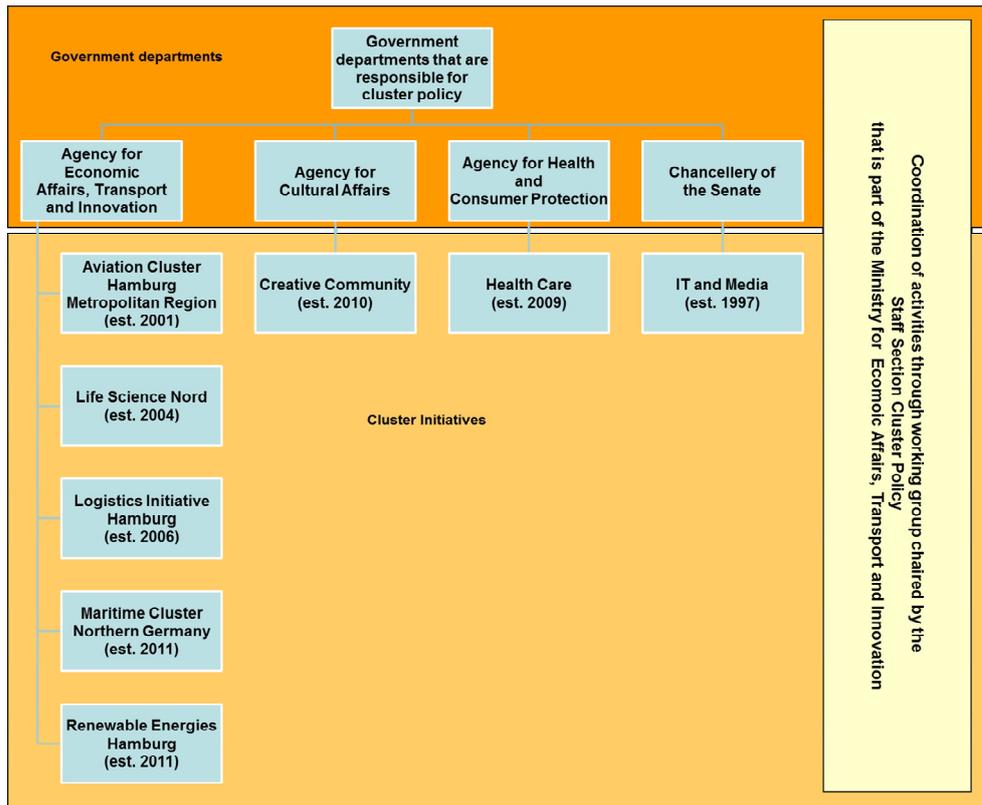


Figure 31: Organizational Framework of Cluster Policy in the Free and Hanseatic City of Hamburg

Cluster initiatives defined within the context of the cluster policy strategy are generally public-private-partnership projects involving the respective government department and relevant stakeholders from science and industry. While this opens access to funding e.g. for cluster management agencies, cluster projects are financed either through other cluster specific or non-cluster specific programs from the Free and Hanseatic City of Hamburg, the Federal Government or the European Union; or they are financed and supported by other means. An excellent example is the Hamburg Centre of Aviation Training (HCAT) of the Aviation Cluster Metropolitan Region Hamburg (www.hcat-hamburg.de), which is funded in cooperation between government ministries and industry.

Financing cluster projects through coordinated efforts of government and cluster stakeholders – illustrated by the example of the Hamburg Centre of Aviation Training (HCAT)

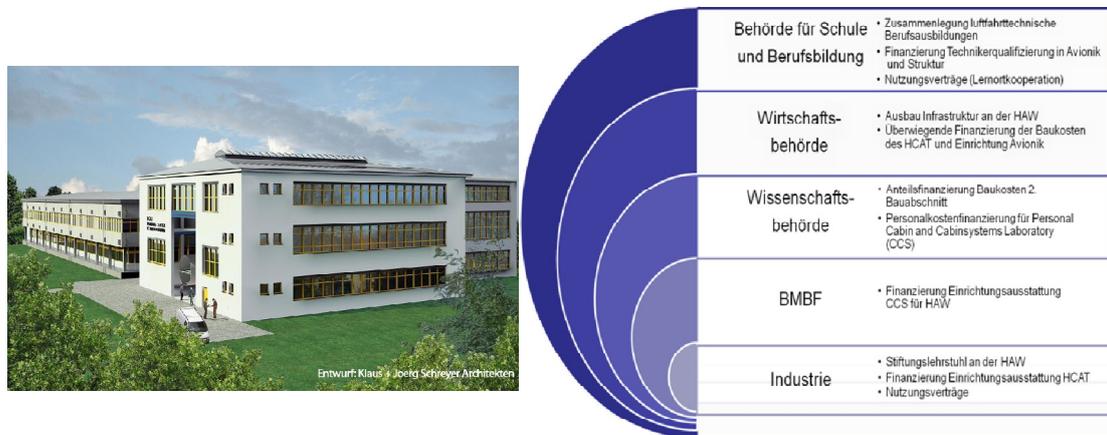


Figure 32: Financing cluster projects through coordinated efforts of government and cluster stakeholders – illustrated by the example of the Hamburg Centre of Aviation Training (HCAT)

The Ministry of Economics, Transport and Innovation has developed a standardized evaluation system to evaluate cluster policy, cluster initiatives and cluster management – the implementation of the system is expected to start in 2012.

2.3 Norway

2.3.1 Norwegian Centres of Expertise (NCE)

Name of program	Norwegian Centres of Expertise (NCE)
Country	Norway
Contact details	Innovation Norway Olav Bardalen P.O. Box 448 Sentrum NO-0104 Oslo Tel.: +47 958 58 649 Email: olav.bardalen@innovasjon norge.no
Internet	www.nce.no

2.3.1.1 Objectives and Rationale of the Program

The program is directed towards regional clusters that are company-based and have a potential for international growth. The clusters should function as drivers for industry development by creating regional business environments through cooperation between companies, researchers and public authorities.

In this context, the **overall objective of the NCE program** is 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. The overall objective is supported by the following **operational objectives of the program**:

- The program will create interest and commitment for development of clusters with growth potential.
- The program will contribute to clear effects through: a markedly improved cooperation and infrastructure within the cluster, increased innovation capabilities, higher level of internationalization, higher level of attractiveness and increased competitiveness and value-creation for the cluster.
- The program will contribute important insights into cooperation-based development processes in regional clusters, resulting in development of operational models and improved policy learning.

In order to contribute to the achievement of the program objectives NCE clusters have to perform according to the following **cluster-specific objectives**:

- Increased cooperation between participants within a cluster and between the cluster and external individuals, companies, organizations, etc.

- Increased innovation capabilities and activities, based on cooperation between businesses and R&D.
- Increased international involvement in the form of expansion into international markets, increased cooperation with knowledge hubs; foreign investments, etc.
- Development of the numbers and composition of participants in the cluster, including the number of new companies established.
- Increased level of competitiveness and value-creation based on innovation and internationalization processes

Each NCE cluster is defined by the following criteria:

1. Business and technological focus:

Each individual NCE shall be established around a cluster's technological and business-related core activities. Focused on continued innovation-based growth nationally and internationally, these activities are related to a well-positioned current competitive position that can be continually developed. Core activities may be based on:

- A particular type of technology or field of expertise, or combinations of both, with established or potential applications in one or more market segments.
- A defined business sector, or combinations of one or more such sectors, directed at a defined market segment.
- Cooperation within an efficient value chain.

2. Geographical concentration:

Each individual NCE is established within a geographically limited cluster. This close proximity shall reflect:

- A physical concentration of the most important companies and related development organizations and institutions in the cluster.
- A naturally functionally interplay between cluster participants, specific cooperative relations, and within a natural community area/radius
- A natural common culture for dialogue and cooperation, common social networks – in other words, a socio-cultural network between cluster members/participants.

3. Groups of cluster participants:

Each NCE is based on a concentration of companies and relevant support functions with a broad composition. With this as a fundamental principle, clusters are additionally defined on the basis of:

- The number of companies and the composition of company groups
- Relevant suppliers of research, education and other knowledge-related services
- Relevant financial institutions
- Relevant government/public developmental bodies and agencies
- Established relations between such cluster participants, including intermediary institutions

2.3.1.2 Target Group of the Program

Main target group of the program are groups of companies that form the core of a regional cluster. This includes in particular companies representing the major proportion of innovation activities and value creation in each cluster's core area of business and that are the key drivers of the cluster. In addition to these so-called "core companies" the main target group also includes "related companies" that supply goods and services to the "core companies".

In addition to the main target group the program also supports organizations that directly contribute to the development of the cluster. This secondary target group includes R&D institutions, educational institutions (schools and institutions from the junior level upwards), institutions that support cooperation within the cluster, government agencies and developmental bodies as well as the financial sector.

2.3.1.3 Term of the Program, Financial Aspects and Application Procedure

Term of the program	Year of inception: 2006, no termination date
Budget	EUR 8.3 million p.a. (NOK 65 million p.a.)
Type of funding	Grant funding and technical assistance
Does the program have a specific technology focus?	No
Are there calls for proposals?	There were calls for proposals in 2006, 2007 and 2009. They did not have specific thematic foci.
Is there a dialogue with applicants about the improvement of their application prior to the final submission of the application?	No
Maximum funding period for a project	10 years. The project period is divided into three contract periods (3.5, 3 and 3.5 years). At the end of

	each contract period an external evaluation is carried out as a basis for renewal of the contract period of the following period.
Is there a maximum amount of funding an applicant can apply for?	Yes, max. EUR 770.500 p.a. (NOK 6 million p.a.)
Financing structure of projects	<ul style="list-style-type: none"> • 50% funding from the NCE program • 50% private means (can be provided through value-in-kind contributions from participating companies)
Most important evaluation criteria for project proposals	<ul style="list-style-type: none"> • Impact on industry sector • Impact on society (non-economic effects) • Knowledge and/or technology transfer • Structure and members of consortium • International orientation • Focus on innovation • Existing linkages

2.3.1.4 Instruments

Beside grant funding for the establishment and management of the NCE cluster organization the program also offers technical assistance to individual NCE clusters.

Grant funding is provided for the following activities:

- **Process management:** This is comprised of people engaged to manage processes, implement agreed activities, as well as document and report regarding activities and results.
- **Network-building:** Activities designed with the goal of strengthening the dialogue and cooperation of companies and knowledge environments within the individual cluster and in relation to the external environment.
- **Analysis and strategy processes:** Processes aimed at developing insight into and specific fundamental aspects of NCE project work.
- **Communication:** Marketing and communication activities directed towards potential new members for each individual cluster; as well as potential customers, knowledge environments (education, research) and investors.
- **Learning & Education Activities:** Development of various competence-building activities in cooperation with educational institutions and other knowledge environments.
- **Project ideas and suggestions** can be developed within the NCE program up to the point when an owner for the project is designated and the project can be evaluated for financing from ordinary financing sources. This can include development of concept and pre-projects for collaborative based innovation projects or for new business ideas; development of application for larger research.

In addition to the grant funding **technical assistance** is provided by experts of Innovation Norway. The target group consists mainly of project managers and teams of the cluster organization, but company groups or knowledge/education/R&D participants may also benefit from special services. Key elements of the technical assistance are:

- Organizing and coordination of a regular joint meeting place for dialogue and cooperation development between NCE projects.
- Planning and staging of courses and seminars; also developing projects related to key topics in conjunction with NCE project activities.
- On-going dialogue with and follow-up of individual NCEs by the program management.
- Facilitating communication with relevant national and international services in the agency system.
- Facilitating communication with relevant international specialist networks.
- Standardized management and reporting tools.
- Communication and information through a common website.
- Active national and international profiling through the agencies' various channels.

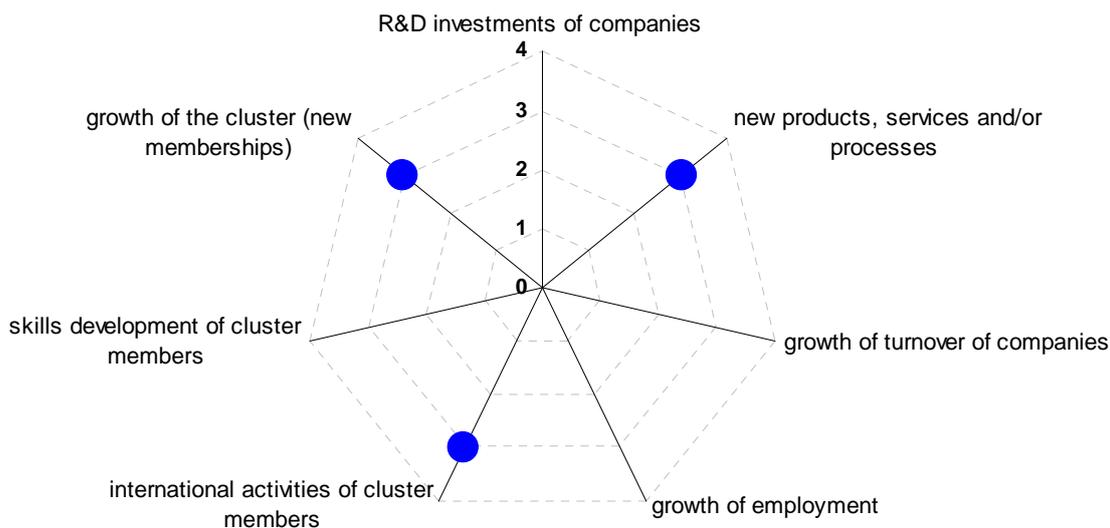
2.3.1.5 Results and Impact of the Program

Today there are 12 Norwegian Centres of Expertise in different industry fields, including instrumentation, maritime, micro and nanotechnology, production and engineering, health, oil and energy, tourism and aquaculture.³⁸

In 2009 530 companies (of which were 480 SME), 10 universities, 60 R&D institutions (almost all of them specializing in applied research), 20 training and education providers, 10 financial intermediaries, 20 consultants and 30 public entities such as municipalities or hospitals participated in one of the Norwegian Centres of Expertise. Only in 2009 the NCE program supported 100 R&D projects jointly implemented by companies and R&D institutions respectively universities. About half of them would not have existed without the activities of the cluster managements.

The figure below indicates the program performance in terms of the results achieved in 2009 based on an assessment made by program officials. The figure shows a very good performance of the program. It had significant effects with regard to the development of new products, services and/or processes, the growth of the clusters and international activities of cluster members.

³⁸ For further details on the Norwegian Centres of Expertise please see http://ekstranett.innovasjon Norge.no/templates/Page_Meta___56536.aspx.



0 = results are poor ⇒ 4 = results are excellent
 Missing values are due to the fact that there is no evidence available.
 This does not mean that there are no effects at all.

Table 25: Results of the program that were achieved in 2009

2.3.1.6 Monitoring and evaluation system

At the program level the following evaluation activities take place:

- A process evaluation of the program is implemented to provide the program management with recommendations for improvements in the strategic development of the program on an on-going basis.
- A main evaluation will be carried out after five years of activities (planned for in 2011) to analyze the results and effects that have been achieved.
- On an annual basis a program report is published which is informed by the annual reports of the NCE clusters.

The following main indicators are used to measure the performance of the program:

Indicators	
Output	<ul style="list-style-type: none"> • Number of partners and participants (companies, R&D, others) • Number of international partners • Number of networks/foras/meeting places • Number of participants in the before mentioned activities • Number of innovation projects: a) with R&D partners and b) with international partners • Funding from R&D programs

	<ul style="list-style-type: none"> • EU funding • Number of internationalization projects • Number of competence/knowledge projects
Results	<ul style="list-style-type: none"> • Increased collaboration • Improved infrastructure for collaboration • Improved innovation capabilities • Increased international orientation • Better access to knowledge resources • Improved attractiveness for investors
Impact	<ul style="list-style-type: none"> • Increased value creation • Increased competitiveness

Beside regular meetings with the cluster initiatives their performance is monitored and evaluated as follows:

- At the end of each year projects shall submit an annual report with the following contents: project activities (based on standardized activity indicators), project results (based on standardized result indicators), specific project activities and results (based on the project plan), a self-assessment of the quality and progress of the development process (based on standardized self-evaluation procedures) and a discussion of interesting results, adapted for external presentations.
- Evaluation of the results achieved as a basis for contract renewal. The program’s renewal of contracts with individual NCE projects will take place on the basis of two reports: a) At the end of a contract period, individual NCE projects submit their own assessment of results achieved and a description of the positive effects to which the project has contributed. Those aims, strategies and activity plans which have formed the basis of the original contract will form the basis of these assessments; b) The NCE program will also implement an external evaluation of the individual project’s activities and results. The project’s own documentation will form the basis for such evaluations, but they may also gather their own data to provide a basis for their assessments.

2.3.1.7 Context of the program

Asked to assess the importance of the program on a scale from 0 (not important at all) to 4 (very important) in relation to the overall economic/industrial development strategy and in relation to other R&D/innovation programs the program authority assigned a 3 to each of the two dimensions (see table below).

The NCE program has its foundation in overall strategic policy documents. This includes in particular the Norwegian White Paper No. 20 (2004-2005) on Commitment to Research which has emphasized the stimulation of innovation through cooperation between companies and knowledge leaders within a limited geographic or business area. The NCE program is one the key initiatives in

this regard. In a 2005 status report of the government on innovation policy the program was specifically referred to as a new tool of innovation policy.

How important is the cluster program in relation to...	0	1	2	3	4
...the overall national economic/industrial development strategy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
...other R&D/innovation programs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>

0 = not important at all ⇒ 4 = very important

Table 26: Relevance of the NCE program in the overall policy setting

Asked about the coordination of the NCE program with other support programs of the country program officials reported a good coordination with R&D programs, while coordination with business development programs and infrastructure programs seems to bear potential for further improvement (see figure below).

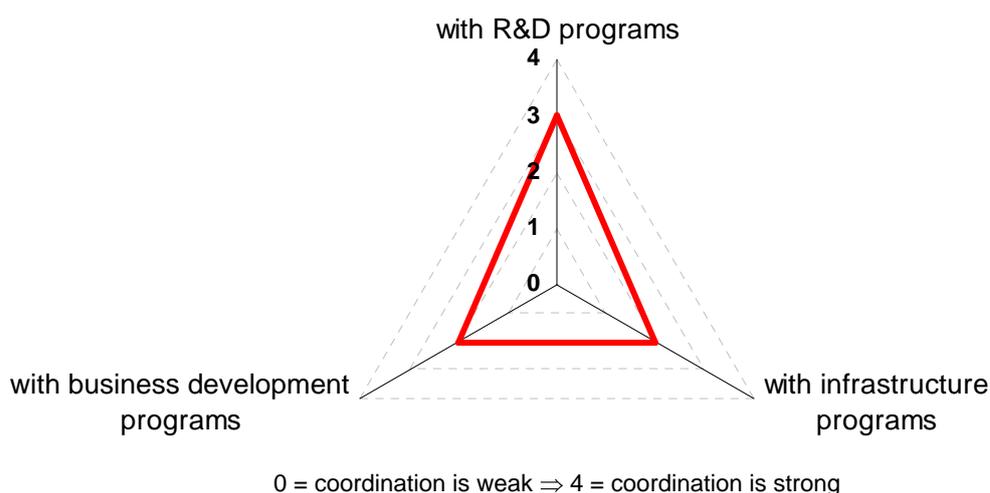


Figure 33: Coordination of the NCE program with other Norwegian funding programs

Established as a joint effort of the government agencies Innovation Norway, the Industrial Development Cooperation of Norway (SIVA) and the Research Council of Norway the NCE program enjoys as a result of this cooperation a well-developed coordination with other related cluster development programs including

- The “Centres for Research-based Innovation (SFI)” program of the Research Council of Norway which has the objective to build up and strengthen Norwegian research groups that work in close collaboration with partners from innovative industry and innovative public enterprises.³⁹ In

³⁹ The purpose of the Centres for Research-based Innovation (SFI) is to build up and strengthen Norwegian research groups that work in close collaboration with partners from innovative industry and innovative public enterprises. For further details please see www.forskningradet.no/servlet/Satellite?c=Page&cid=1224067021109&p=1224067021109&pagename=sfi%2FHovedsidemal.

some NCE clusters Centres for Research-based Innovation (SFI) are involved that are supported by the Research Council of Norway. This creates a synergy effects between an industry-oriented cluster program - the NCE program - on the one hand, and a more research-oriented program – the Centres for Research-based Innovation program - on the other hand; and

- The ARENA cluster development program, which is also a joined effort of the three agencies, but in contrast to the NCE program it supports a broader range of clusters and support is typically provided in the early stages of development of a cluster. This program can act as a qualifying arena for the NCE program for regional clusters with a development potential which have not yet developed sophisticated cooperative and strategy fundamentals.

2.3.2 Arena-programmet (The Arena Program)

Name of program	Arena-programmet (The Arena Program)
Country	Norway
Contact details	Innovation Norway Olav Bardalen P.O. Box 448 Sentrum NO-0104 Oslo Tel.: +47 958 58 649 Email: olav.bardalen@innovasjon Norge.no
Internet	www.arenaprogrammet.no

2.3.2.1 Objectives and Rationale of the Program

Originating from several regional pilot projects which pursued the objective of improving interaction between industry, R&D institutions and the public sector the Arena program was established in 2002 to support multi-annual development processes in regional business environments.

The **overall objective** of the program is 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. The overall objective of the program is supported by a number of **operational objectives** including:

1. Increased internal and external collaboration through
 - Fixed, organized conferences and meeting points,
 - Added trust and reduction in barriers between participants
 - New or strengthened relations with external participants, both nationally and internationally.

2. Focus on innovation and collaboration

- Groups working together in order to achieve innovation
- Specific innovation projects based on collaboration between several participants
- Participating companies possessing a high degree of innovative talent and activity

3. Focus on business-oriented R&D and educational institutions

- Increased involvement from the R&D institutions in development processes and development projects
- Increased involvement from educational institutions to help long-term access to qualified personnel

4. Increased awareness about the importance of long-term cooperation within the industry, educational institutions and the public sector through specific cooperative initiative and processes inspired by Arena's experience and work methods.

5. Increased expertise and involvement from the public support system

- Increased knowledge about government initiatives
- Increased interaction and use of means among the public support system
- Increased focus on cluster development within the regions

Open to project initiatives in all Norwegian regions and sectors (including cross-regional and cross-sector projects) the program can support regional business environments that are in an early development stage with respect to the market and a technology. It may also support more matured regional business environments which have an ambition to renew themselves with regard to established markets or technologies. A key selection criterion for support is the potential for development a project has and the project's possibilities to initiate and strengthen the development process.

If a project initiative originates from a well-established business sector it has to be rooted in regional development strategies. This is not required if the project initiative is in a sector or an environment which is still at an early-stage of its development.

2.3.2.2 Target Group of the Program

The target group of the program includes groups of companies, relevant knowledge providers and public institutions that form the core of a regional business cluster. The group has to be characterized by a regional concentration of its members, a common association to a business sector, a value chain, a market and an area of expertise. Its members have to identify common interests, which form a basis for increased interaction and cooperation. Companies have to be at the center of this group, while R&D and educational institutions and government institutions are supporters for the companies.

2.3.2.3 Term of the Program, Financial Aspects and Application Procedure

Term of the program	Year of inception: 2002, no date of termination yet
Budget	EUR 5 million p.a.
Type of funding	Grant funding and technical assistance
Does the program have a specific technology focus?	No
Are there calls for proposals?	Yes, once a year. Calls for proposals do not have a specific thematic focus.
Is there a dialogue with applicants about the improvement of their application prior to the final submission of the application?	Yes
Maximum funding period for a project	<ul style="list-style-type: none"> • Max. 5 years. Funding is provided for three years, but can be extended by two years.
Is there a maximum amount of funding an applicant can apply for?	Max. EUR 300,000 p.a.
Financing structure of projects	<ul style="list-style-type: none"> • Max. 50% funding from the Arena program • Min. 50% private means (can be provided through value-in-kind contributions from participating companies)
Most important evaluation criteria for project proposals	<ul style="list-style-type: none"> • Impact on industry sector and companies • Impact on society (non-economic effects) • Knowledge and/or technology transfer • Structure and members of the consortium

2.3.2.4 Instruments

Support for the development of clusters is provided by the Arena program through grant funding and technical assistance.

Grant funding is provided for the following activities:

- Management of the development processes
- Development of meeting places and networks
- Development of strategies and analytic support
- Communication and branding
- Knowledge development
- Early phase idea and project development (pre-studies and pre-projects)

Actual development processes as well as the establishment and management of physical infrastructure are not eligible under the Arena program. Funding for these activities has to be sourced from other private and public financial schemes.

Technical assistance instruments include:

- Professional meeting places for project managers/project partners, project meetings, workshops and study trips
- Support tools as handbook and working models
- Exchange of experience via the program's website and in other settings
- Advisory service for project managers including professional consultancy (one-to-one), colleague-based guidance and coaching
- Courses in cluster development (with other target groups)
- Alliances with other relevant services; nationally and internationally

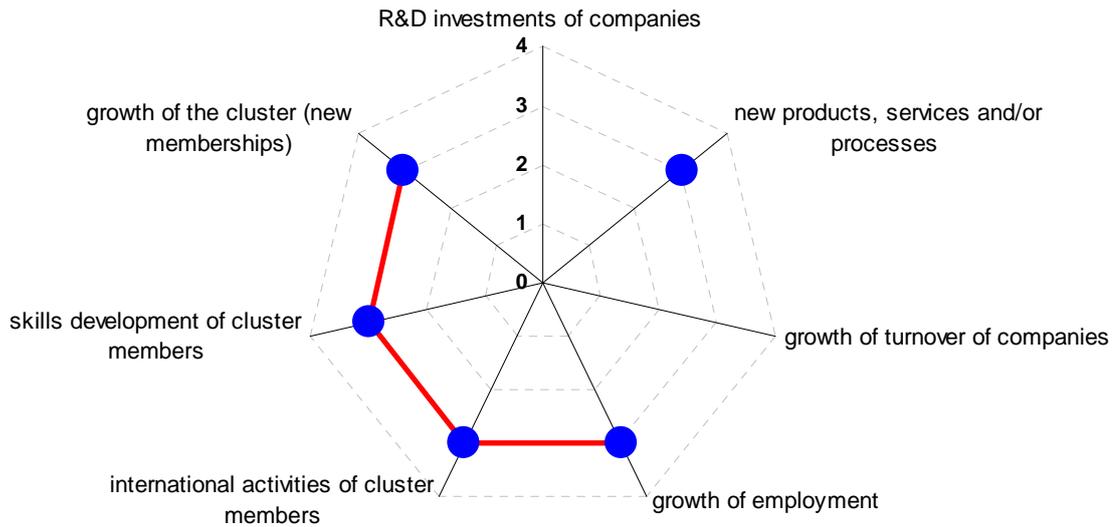
This professional support is organized through the program's "training arena".

2.3.2.5 Results and Impact of the Program

Eighteen cluster organizations, which cover a wide array of industries, are supported within the program.⁴⁰ In total more than 940 companies (of which are 900 SME), 18 universities, 100 applied research institutions, 40 training and education providers, 10 consultants/communication agencies and 50 public entities participated in 2009 in the clusters. Within the clusters 80 R&D projects involving both companies and research institutions/universities were supported by the program in 2009. In the same year 1,250 additional jobs were created by cluster members.

According to program officials the program yielded very good results with respect to new products, processes and/or services, growth of company turnover, growth of employment, international activities of cluster members, skills development of cluster members and growth of the cluster in terms of membership (see figure below).

⁴⁰ For an overview of the clusters please see www.arenaprogrammet.no.



0 = results are poor ⇒ 4 = results are excellent
 Missing values are due to the fact that there is no evidence available yet.
 This does not mean that there are no effects at all.

Figure 34: Results of the program that were achieved in 2009

2.3.2.6 Monitoring and evaluation system

The program is regularly evaluated to assess its organization, implementation and results/effects. Evaluations were conducted for the periods 2003-2005 and 2006-2007. Another evaluation has been initiated in 2010 to assess the program results and effects.

The following main indicators are used to measure the performance of the program:

Indicators	
Output	<ul style="list-style-type: none"> • Number of cluster initiatives applying for support of the program • Number of foras, networks and meeting places • Number of collaborative innovation projects/ • Number of companies • Number of internationalization projects • Number of competence/training projects • Number of communication/profiling activities
Results	<ul style="list-style-type: none"> • Reduced barriers for collaboration/increased trust within the cluster • New and stronger linkages with external partners nationally • New and stronger linkages with international partners • Increased innovation capabilities and activities in partner companies • Increased involvement from R&D institutions in the development of the cluster • Increased involvement from educational institutions/improved educational

	schemes
Impact	<ul style="list-style-type: none"> • Increased capabilities in the cluster for innovation and value creation • Increased knowledge and improved methods and tools for cluster development • Contribution to policy learning

Beside regular meetings with program officials monitoring and evaluation of the performance of the cluster initiatives is based on regular reporting. This includes:

- An annual report containing a summary and evaluation of activities and results, quantitative and standardized data about the project's participants, activities and results, as well as a report about two selected activities or results that might be of interest to others.
- A result report, as a basis for yearly renewals of funding and contracts. The result reports are focused on realization of agreed targets.
- A final report that summarizes and evaluates the project's activities and results at the end of the project. The report shall also include how the development processes can be continued after the Arena period.
- A final evaluation, which is an external evaluation of the project when finished. The evaluation is ordered and paid by the project.

2.3.2.7 Context of the program

Asked to assess the importance of the program on a scale from 0 (not important at all) to 4 (very important) in relation to the overall economic/industrial development strategy and in relation to other R&D/innovation programs the program authority assessed the program as important with regard to the overall national economic/industrial development strategy, while it is considered as being less important with regard to other R&D/innovation programs (see table below).

How important is the cluster program in relation to...	0	1	2	3	4
...the overall national economic/industrial development strategy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
...other R&D/innovation programs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

0 = not important at all ⇒ 4 = very important

Figure 35: Relevance of the Arena program in the overall policy setting

From the perspective of program officials the Arena program is well coordinated with other Norwegian funding programs, particularly with R&D programs where coordinated is rated as “excellent” (see figure below). The joint ownership of the program of Innovation Norway, the Research Council of Norway and the Industrial Development Cooperation of Norway (SIVA) is certainly an asset in this regard. As already indicated in the analysis of the Norwegian Centres of Expertise program the Arena program can act as a qualifying arena for the NCE program for regional clusters with a development potential which have not yet developed sophisticated cooperative and strategy fundamentals.

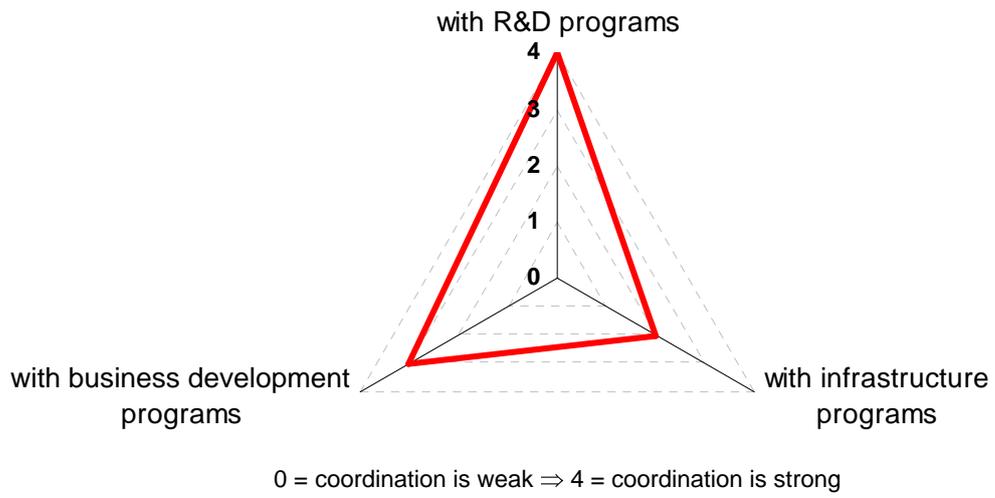


Figure 36: Coordination of the Arena program with other Norwegian funding programs

2.4 Sweden

2.4.1 VINNVÄXT (Sweden)

Name of program	VINNVÄXT
Country	Sweden
Contact details	Vinnova Göran Andersson Program Manager Mäster Samuelsgatan 56 SE-101 58 Stockholm Tel.: +46 8 473 30 83 Email: goran.andersson@vinnova.se
Internet	www.vinnova.se/en/activities/vinnvaxt

2.4.1.1 Objectives and Rationale of the Program

The **overall objective** of the VINNVÄXT program is to promote sustainable growth in regions by developing competitive research and innovation environments within specific growth fields. Cutting-edge competence of the environments shall be strengthened through needs-driven funding of R&D and strategic efforts for the development of effective regional innovation systems. Based on a competition a limited number of regions have been chosen for support. Each winner shall become internationally competitive in its field of expertise within 10 years.

To become internationally competitive the following **operational objectives** have to be achieved in each region:

- Research and education in focused growth areas in the region are developed according to high international standards.
- Interaction and mutual learning between different competences and organizations (companies, R&D institutes, colleges, universities, etc.) is effective.
- The infrastructure of the innovation system in the region is developed so that all its components are of a high standard both individually and when seen as a whole. This requires co-ordinated measures and investments from the private, public and research sectors and from the political sphere. Such measures may include support for new spin-off/hive-off companies from research institutes or companies, risk capital, technical and competence brokering, networks between companies, joint marketing activities, the recruitment of cutting-edge competence and the provision of housing, land, premises, communications etc.

In the context of the program regions are not understood as “administrative regions” (e.g. a municipality or a county), but as “functional regions”. It is the geography and not administrative boundaries that matters in terms of the development of social capital and confidence between relevant stake-

holders in regions. In the practical implementation of the program this approach applied both to the support of municipality-based initiatives (e.g. the cluster Uppsala BIO) and large regional-based initiatives (e.g. the cluster Process IT Innovations). Funding may be used for a wide array of projects and activities depending on the existing capabilities and shortcomings in the regional system of innovation.⁴¹

Following the selection of three winning initiatives in 2003 and further five in 2004, in 2008 four - in contrast to the initiatives that had been selected until then - more embryonic innovation systems were selected under a special call for proposals entitled “Early-Stage Innovation Systems”.

2.4.1.2 Target Group of the Program

Target group of the program are regional-based consortia including companies, R&D actors and public institutions (triple helix approach).

2.4.1.3 Term of the Program, Financial Aspects and Application Procedure

Term of the program	2002-2015
Budget	EUR 8.8 million (SEK 79 million)
Type of funding	Grant funding and technical assistance
Does the program have a specific technology focus?	No
Are there calls for proposals?	There were calls for proposals in 2002, 2003 and 2008. They did not have specific thematic foci.
Is there a dialogue with applicants about the improvement of their application prior to the final submission of the application?	Yes
Maximum funding period for a project	10 years. Funding is allocated for contract periods of 3.5 years and beneficiaries have to submit a status report every third year to prove their progress to be eligible in the following period.
Is there a maximum amount of funding an applicant can apply for?	EUR 1.1 million p.a. (SEK 10 million p.a.)
Financing structure of projects	<ul style="list-style-type: none"> • Max. 50% funding from the program • Min. 50% regional co-funding (cash funds or in-kind-contributions)
Most important evaluation criteria for project proposals	<ul style="list-style-type: none"> • Impact on industry sector and companies • Impact on society (non-economic effects) • SME focus or SME participation in activities • Credibility of the triple helix partnership of the applicants

⁴¹ Vinnova, 2010: VINNVÄXT at the Halfway Mark – Experiences and Lessons Learned, p. 7

2.4.1.4 Instruments

The VINNVÄXT program offers both grant funding and technical assistance (process support) to the winning regions.

Grant funding is provided for the following activities:

- For the development of the identified innovation system funding is provided for
 - Process management
 - Future-oriented processes and technological scenarios
 - Analyses and the drawing up of strategies to lift the innovation system to an international level
 - The commissioning of research and expert competence in the fields of learning, network organization and leadership
 - The development of preconditions for learning and innovations.
- For needs-driven research within the identified growth field through joint projects of colleges/universities and companies.

In the initial phase of support funding is focused on the development of the identified innovation system while needs-driven research projects are being prepared. In the course of support regions are expected to cover most of the funding for the further development of the innovation system, while VINNVÄXT funding is devoted to needs-driven research and development funding.

In addition to grant funding **technical assistance** is provided to the regions to support their efforts. This includes

- Training courses offered by the DahménInstitute⁴² to support cross-border, interdisciplinary learning about and for regional development processes, innovation systems in regions and knowledge-driven clusters.
- A Process Manager Network as a forum to exchange of experiences between process managers, consultants, researchers and other relevant stakeholder. Work of the network has focused on the development of networks, indicators for success and how to communicate ideas within a regional system of innovation. The network is also organized by the DahménInstitute.
- A resource handbook “Mobilizing for Regional Growth – Regional Development Processes, Clusters and Innovation Systems” was produced by the DahménInstitute to support both practitioners and policy makers in their work on cluster development.

⁴² The Dahmén Institute (DI) is a network organization working towards the increase of knowledge in the development of Swedish innovation policies as well as the promotion of Sweden’s regional and national economic growth. For further information please see www.dahmeninstitutet.se.

2.4.1.5 Results and Impact of the Program

Today there are 12 cluster organizations including 512 companies (of which are 411 SME), 15 universities, four applied research institutions and more than 100 public entities.

An evaluation report published by Vinnova in 2010 (“VINNVÄXT at the Halfway Mark”) that has analyzed 8 out of the 12 clusters identified the following results and impacts with regard to the overall objective of the program, the development of a regional system of innovation:⁴³

- Three out of eight cluster organizations report an increase in number of memberships. At least in these cases stakeholders perceive added value from a participation in the cluster organization which involves the payment of membership fees.
- The R&D profile of a number of regions has strengthened through the establishment of research centres in the corresponding regional focus areas. However, evaluators conclude that it is difficult to say how much the initiatives' operations have contributed to this.
- There are examples of increased investment by the public players in activities to strengthen the cluster organizations operations in the respective focus areas.
- There is evidence of a change in the mindsets of stakeholders who subordinate their personal interest to the overall interest of the cluster.

According to the 2010 evaluation report most initiatives conduct activities to promote internationalization of the cluster. Activities include i.a. export and investment promotion, participation in fairs and conferences, delegation trips as well as, in some cases, the development of internationalization strategies. The extent of internationalization activities differs between the clusters; some made the initial choice to focus first on regional activities before going international, others are very active particularly those that are operating in an international industry such as Uppsala BIO, Biomedical Development in Western Sweden and Robotdalen.⁴⁴

All initiatives have developed a portfolio of R&D projects to support the development of the regional system of innovation. The number of projects differs between the clusters; some fund quite a lot projects (which may result in the risk of subcritical funding of individual projects), while others concentrate on a small number of big projects with a large amount of individual funding. Only a few cluster initiatives appear to have a clear strategy on how their R&D project portfolio should contribute to the positioning of the regional players in an international comparison.⁴⁵

With regard to industrial development and commercialization of results the cluster initiatives conduct a number of activities. Although the cluster initiatives have varying interests in commercialization of R&D results, most of them are active in this area. Six out of the first eight winning regions reported the start-up of new companies based on their activities. The number of newly-established companies varies from one to eleven for the six clusters. Three out of the four latest competition winners reported the establishment of one new company. The performance of some regions may be influenced by an underdeveloped infrastructure for commercialization and promotion of start-up

⁴³ Vinnova, 2010: VINNVÄXT at the Halfway Mark – Experiences and Lessons Learned, pp. 34-35

⁴⁴ Ibid., pp. 23-25

⁴⁵ Ibid., p. 29

companies; but the concerned cluster organizations play an active role in developing such an infrastructure, which may help to increase the number of newly established companies.⁴⁶

The first eight VINNVÄXT cluster initiatives that were set up in 2003 and 2004 developed in total 56 new goods, 10 new services and 60 new processes for producing goods and services in 2008/2009 (Swedish financial year). However, the majority of those goods, services and processes were developed by just two initiatives.⁴⁷ The four VINNVÄXT initiatives that were set up under the “Early-Stage Innovation Systems” call in 2008 developed a total of two new goods and two new processes in 2008/2009. Half of those new developments originate from one cluster initiative.⁴⁸

2.4.1.6 Monitoring and evaluation system

The following main indicators are used to measure the performance of the program:

Indicators	
Output	<ul style="list-style-type: none"> • Activities performed by the cluster initiatives: <ul style="list-style-type: none"> ▪ Regional and national strategic processes ▪ Regional meeting arenas ▪ Communication and marketing ▪ Competence supply ▪ Funding of R&D projects ▪ Internationalization ▪ Integration of gender perspectives ▪ Needs-driven research ▪ Stimulating the formation of new enterprises ▪ Development of existing industry and/or public sector ▪ Activities for individual learning, monitoring and evaluation
Results	<ul style="list-style-type: none"> • Impact on the level of prioritization and specific actions taken by the regional actors in order to stimulate the cluster focus area: <ul style="list-style-type: none"> ▪ Number of actively involved companies ▪ Number of projects and project content ▪ Funding of development or maintenance of infrastructure for R&D processes (instruments, test beds etc.) ▪ Number of new patents/products/processes/prototypes developed in activities cofinanced by the cluster initiative ▪ Number of scientific publications and other publications (taking also into account whether they are co-published between academia and industry) ▪ Number of newly established companies as a result of or stimulated by cluster activities ▪ Number of involved researchers and examination of individual PhD stu-

⁴⁶ Ibid., pp. 30-31

⁴⁷ Ibid., p. 165

⁴⁸ Ibid., p. 171

	<ul style="list-style-type: none"> ▪ Inward investment ▪ Establishment of companies or expansion of already existing companies ▪ Number, type and content of established networks that meet regularly
Impact	<ul style="list-style-type: none"> • Impact on R&D: <ul style="list-style-type: none"> ▪ Increased supply of R&D-based knowledge relevant for the cluster through reinforced and focused R&D capacity in the region and international and national connections that are made available and that are being used • Impact on commercialization: <ul style="list-style-type: none"> ▪ Renewed/upgraded companies with increased value added based on R&D derived products ▪ Internationally competitive research and innovation environment (cluster)

No except for companies that are involved in the cluster no economic indicators are used as it is difficult to establish a resilient cause-and-effect chain between the activities of the cluster initiatives and their impact on the economy.

Beneficiaries are monitored by regular written reports, regular meetings with the program owners, IT-based monitoring, regular independent evaluations and individual contacts with representatives of the initiatives.

Independent evaluations of the program are carried out every 36 months.⁴⁹

2.4.1.7 Context of the program

Asked to assess the importance of the program on a scale from 0 (not important at all) to 4 (very important) in relation to the overall economic/industrial development strategy and in relation to other R&D/innovation programs program officials reported that the VINNVÄXT program is not important at all.(see table below). This was explained by arguing that the debate on cluster policy has started just recently in Sweden and there is no overall innovation policy framework assigning relevance to the program. The program is also very small in terms of budget. The VINNVÄXT budget of SEK 80 million equals roughly 4 per cent of the entire budget of VINNOVA which in turn accounts for some 6-7 per cent of the entire national R&D budget of Sweden.

How important is the cluster program in relation to...	0	1	2	3	4
...the overall national economic/industrial development strategy?	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...other R&D/innovation programs?	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

0 = not important at all ⇒ 4 = very important

Table 27: Relevance of the VINNVÄXT program in the overall policy setting

⁴⁹ Evaluation reports are available at www.vinnova.se/en/Activities/VINNVAXT/Publications/.

The lack of an overall coordinating policy framework also explains the very weak coordination of the VINNVÄXT program with other Swedish funding programs that was indicated by program officials. Some coordination with other programs does however exist (e.g. with the Regional Cluster Program of Tillväxtverket). The lack of coordination is to some extent due to that VINNVÄXT is not a program targeted at top down identified business or technology segments. Even if The VINNVÄXT program as such is not coordinated with other national programs, the initiatives are expected to coordinate their projects and activities with the existing innovation support system. They are also expected to identify issues to address and initiate activities e.g. to address bottlenecks, find solutions to overcome missing functions and further promote the identified potentials for innovation and growth.

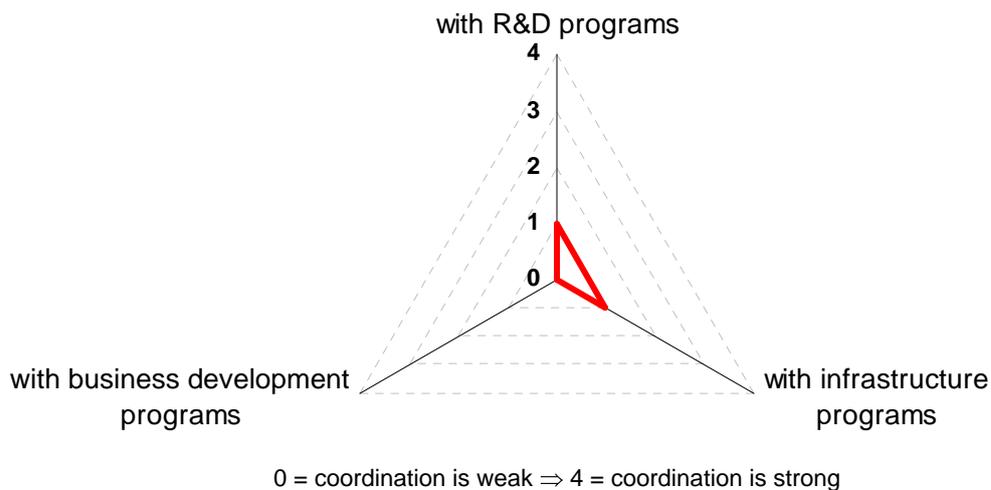


Table 28: Coordination of the VINNVÄXT program with other Swedish funding programs

2.4.2 Regionalt klusterprogram (Regional Cluster Program) (Sweden)

Name of program	Regionalt klusterprogram (Regional Cluster Program)
Country	Sweden
Contact details	The Swedish Agency for Economic and Regional Growth (Tillväxtverket) Ewa Andersson Box 4044 S-102 61 Stockholm Tel.: +46 8 681 94 51 Email: ewa.andersson@tillvaxtverket.se
Internet	www.tillvaxtverket.se

2.4.2.1 Objectives and Rationale of the Program

The Regional Cluster Program is basically aiming at the strengthening of regional systems of innovation through the support of cluster initiatives that are looking to strengthen their renewal capacity and competitiveness by means of commercial collaboration, cluster expansion and networking (**overall objective**). A successful cluster is considered to be an important generator for regional and national economic growth and a powerful tool to achieve international competitiveness. In this regard the specific **operational objectives** of the program include:

- The support of international competitiveness of cluster initiatives and their participating companies in terms of their exports, sales, number of international contacts, acquisitions, establishments, cost-reducing exports, etc.
- The contribution to a strengthened knowledge and method development of regional clusters in the sense of an increased awareness in the cluster initiatives and their regions of their potential for economic development.

The program is directed towards business driven cluster initiatives that have their operative management in Sweden. Participation of companies and their capacity for renewal of products, services and/or applications are key criteria for support. They are expected to collaborate with both local and regional actors as well as universities in order to create a platform for sustainable growth.

Since its inception the program has mainly supported matured cluster initiatives that have already featured a well-developed collaboration between the relevant stakeholders which had a national reputation in their area of expertise and were in the phase of internationalization and business development. But support has also been provided to cluster initiatives in an early stage of development if their efforts were focused on creative links between different industry sectors respectively areas of expertise. In the course of the program lifetime focus of the program agency has shifted towards linking mature clusters with one another and research and knowledge actors to support the development of new business opportunities and industry development.

2.4.2.2 Target Group of the Program

The target group of the program are business-driven cluster initiatives with companies at the core that are supported by educational institutions (e.g. universities) and public bodies.

2.4.2.3 Term of the Program, Financial Aspects and Application Procedure

Term of the program	2005 to 2010
Budget	EUR 6.8 million (SEK 61 million)
Type of funding	Grant funding and technical assistance
Does the program have a specific technology focus?	No
Are there calls for proposals?	There are no calls for proposals.
Is there a dialogue with applicants about the improvement of their application prior to the final submission of the application?	Yes
Maximum funding period for a project	Three years plus an extension of two years.
Is there a maximum amount of funding an applicant can apply for?	EUR 150,000 p.a.
Financing structure of projects	<ul style="list-style-type: none"> • Max. 50 % funding from the program • Min. 50% private sector or local/regional public, EU structural funds co-financing
Most important evaluation criteria for project proposals	<ul style="list-style-type: none"> • Impact on industry sector and companies • SME focus/SME participation in activities • Long-term commitment of regional stakeholders

2.4.2.4 Instruments

Besides **grant funding** for the establishment and management of the cluster initiatives and smaller projects (e.g. on commercialization of research results, internationalization and the promotion of the cluster organization) **technical assistance** is provided by Tillväxtverket through seminars and trainings as well as by consultancy services for individual clusters. The program owner also plays an active role in linking cluster initiatives with other initiatives and decision makers at the regional and national level; in this context Tillväxtverket cooperates for example with Reglab⁵⁰ in Sweden. According to an evaluation report of 2010 “the program’s way of working [with technical assistance instruments to support knowledge development], using an on-going dialogue with the initiatives and process managers, represents the major difference compared with other programs. This is an important reason why the method support has been so well received by the participating initiatives. [...] The increased knowledge has led to better use of various tools such as business plans and strategies.”⁵¹

⁵⁰ For further details on the activities of Reglab please see www.reglab.se.

⁵¹ Tillväxtverket, 2010: Halvtidsutvärdering Klusterprogrammet 2006-2010 (Halfway Evaluation. The Cluster Program 2006-2010), p. 19

2.4.2.5 Results and Impact of the Program

In 2010 the program supported 19 cluster initiatives originating from various industrial sectors.⁵² The clusters differ in terms of number of active members and composition of membership. The mid-term evaluation of the program (covering twelve cluster initiatives that have received funding in the period 2006-2008) concluded that in all initiatives companies, academia and public stakeholders collaborated. In the course of the program implementation the business community has gradually come to play a more and more active role in the cluster management and in the performance of the activities. They have recognized the added-value that derives from their participation. As a result the initiatives have become more business-minded, more company-driven and work more with internationalization. Member companies stated that they have seen positive effects from their cluster membership in terms of new transactions, clients and markets. Three quarters of the interviewed companies claimed that their expectations towards cluster membership have been met in a satisfactory or highly satisfactory manner. Companies that were partner in one of the cluster initiatives grew at a faster rate than comparable companies in the respective industries on a national level. However, only the matured cluster initiatives developed a national and/or international perspective, while the early-stage clusters were of a more regional character overall.⁵³

Technical assistance for method and knowledge support has had the greatest impact on the cluster initiatives, while financial support from the program was more important in the early stages of a cluster's development.⁵⁴ The evaluation report concludes that once the early stage has been past, the program should step aside as financier and local and regional stakeholders should subsequently fund the cluster initiative together with the members.⁵⁵ The cluster initiatives continue to depend strongly on public regional funding in order to perform their activities. While it is not realistic to imagine cluster initiatives and their activities being funded entirely by membership fees and revenue from external projects, there is a need for long-term public funding.⁵⁶

2.4.2.6 Monitoring and evaluation system

The following main indicators are used to measure the performance of the program:

Indicators	
Output	<ul style="list-style-type: none"> • Number of cluster initiatives and meeting areas that are funded • Number of needs-driven interface activities that are funded • Targets for funding, i.e. number, or paid funds • Number of network meetings with cluster initiatives to share knowledge and experiences (at least two p.a.) • Number of studies performed in areas that are central to cluster initiatives, regions and the agency • Implementation of international benchmarking and exchange of experiences via

⁵² For a list of all cluster initiatives please see <http://www.tillvaxtverket.se/huvudmeny/insatserfortillvaxt/flerochvaxandeforetag/klusterprogrammet/lankartillklusterinitiativeniklusterprogrammet.4.21099e4211fdb8c87b800017784.html>

⁵³ Tillväxtverket, 2010: Halvtidsutvärdering Klusterprogrammet 2006-2010 (Halfway Evaluation. The Cluster Program 2006-2010), pp. 17, 19, 22-23, 26

⁵⁴ Ibid., p. 30

⁵⁵ Ibid., p. 21

⁵⁶ Ibid., p. 7

	OECD, EU and TCI
Results	<ul style="list-style-type: none"> • 70 per cent of the cluster initiatives' businesses should have increased their capacity for renewal through new products/services/processes • 70 per cent of the cluster initiatives' companies have increased their turnover. The companies should have outperformed the overall industry index. • 70 per cent of the cluster initiatives should have attracted resources in the form of more companies (new companies, spin-offs, foreign investment) and/or R&D resources • 70 per cent of the cluster initiatives should have been working with sustainability issues from a profitability perspective • 80 per cent of the cluster initiatives have expanded their international collaborations, 70 per cent should have participated in EU programs • 90 per cent of the cluster initiatives should have knowledge/experience to support the agency or other cluster initiatives through the agency at network meetings • 80 per cent of the concerned authorities feel that the cooperation has created added value and contributed to important information on cluster and innovation activities
Impact	<ul style="list-style-type: none"> • 70 per cent of the cluster initiatives have increased their international competitiveness • Contribution to the development of knowledge and methods for cluster processes • 70 per cent of the cluster initiatives and regional promoters say that they have gained knowledge/method knowledge of cluster development • Contribution to the increased coordination between regional and national efforts focusing on clusters and innovation

Beneficiaries are monitored by means of regular written reports, regular meetings with the program owner and regular independent evaluations.

Independent evaluations of the program are carried out every 24 months.

2.4.2.7 Context of the program

The program official assessed the relevance of the program for the overall national economic/industrial development strategy as low because it is not embedded in an overall strategy for the time being as there is no Swedish national innovation strategy for the time being. However, this does not mean that the Swedish national government does not attach any importance to cluster policy. Already in 2001 a government communication on regional development policy stressed the importance of linking work on clusters and innovation systems with regional development programs.⁵⁷ The development of a national cluster policy has recently got new momentum, so that the program official's assessment may change in the future. The low relevance in relation to other

⁵⁷ Ibid., p. 8 (Government Communication 2001/02: 4: En politik för tillväxt och livskraft i hela landet (A policy for growth and vitality throughout the country))

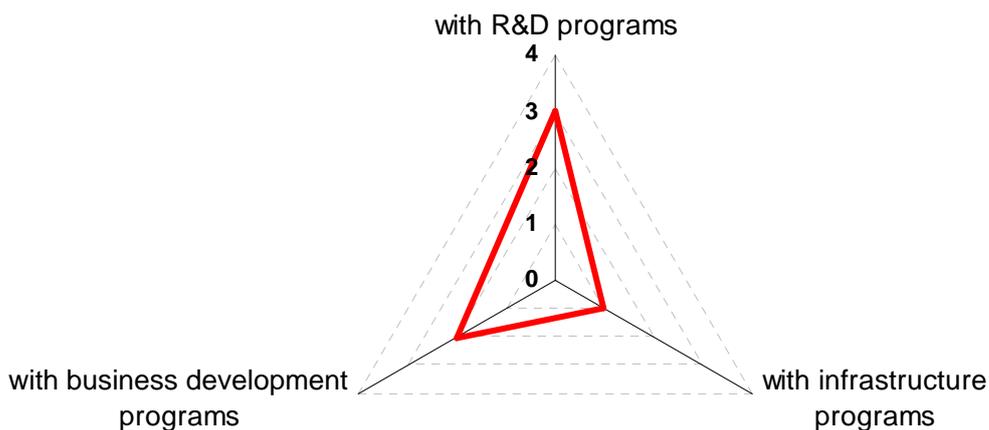
R&D/innovation programs was explained through the strategic focus of the program which is about business development and less about R&D and innovation (see table below).

How important is the cluster program in relation to...	0	1	2	3	4
...the overall national economic/industrial development strategy?	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...other R&D/innovation programs?	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

0 = not important at all ⇒ 4 = very important

Table 29: Relevance of the Regional Cluster Program in the overall policy setting

Notwithstanding its small relevance the program is according to the program official well-coordinated with other national R&D programs, while the coordination with other business development programs is – given the strategic focus of the program – surprisingly weak (see figure below).



0 = coordination is weak ⇒ 4 = coordination is strong

Figure 37: Coordination of the Regional Cluster Program with other Swedish funding programs

2.5 Finland

2.5.1 The Centre of Expertise Program (OSKE, Osaamiskeskusohjelma)

Name of program	Centre of Expertise Program (OSKE, Osaamiskeskusohjelma)
Country	Finland
Contact details	Ministry of Employment and the Economy Riikka Pellikka P.O. Box 32 FI-00023 Government Tel.: +358 50 302 7671 Email: riikka.pellikka@tem.fi
Internet	www.oske.net

2.5.1.1 Objectives and Rationale of the Program⁵⁸

Based on the Regional Development Act (602/2002) the Centre of Expertise (OSKE) program aims at focusing regional resources and activities on new areas of strategic importance. It shall improve the conditions for investment in and development of internationally competitive business and research operations that demand a high level of expertise. The program history dates back until 1994 and can be distinguished in two periods:

The OSKE program 1994-2006

The overall objective of the OSKE program in this period was to support regional economic development through the support of centres of expertise. The core function of a center of expertise was to initiate and coordinate cooperation among research institutes, universities, technology center, the business sector and various providers of funding in selected fields of expertise. The centres were usually managed by non-profit public body. Each center implemented its own program based on the development needs of companies and other institutions within the regional system of innovation it was located in. Thus, strategies and objectives of the programs implemented by centres of expertise were different depending on the regional situation.

The program, which supported 22 centres of expertise throughout the country (see Figure 38), was successful as it has encouraged regions to focus their limited resources on their specific strengths and opportunities. The program had a significant impact of job growth, skills development and the regional capacity to utilize research and development resources through the creation of compe-

⁵⁸ Government of Finland, 2005: Osaamiskeskusohjelma 2007-2013, Valtioneuvoston erityisohjelmat: Alueiden kehittämislaki (602/2002), Valtioneuvoston (1224/2002) (Centre of Expertise Program 2007-2013). Special Government Programs: Regional Development Act (602/2002), Government Decree (1224/2002)

tence-based clusters. In this context the program also contributed to the creation of permanent operating models that boosted cooperation among different organizations.

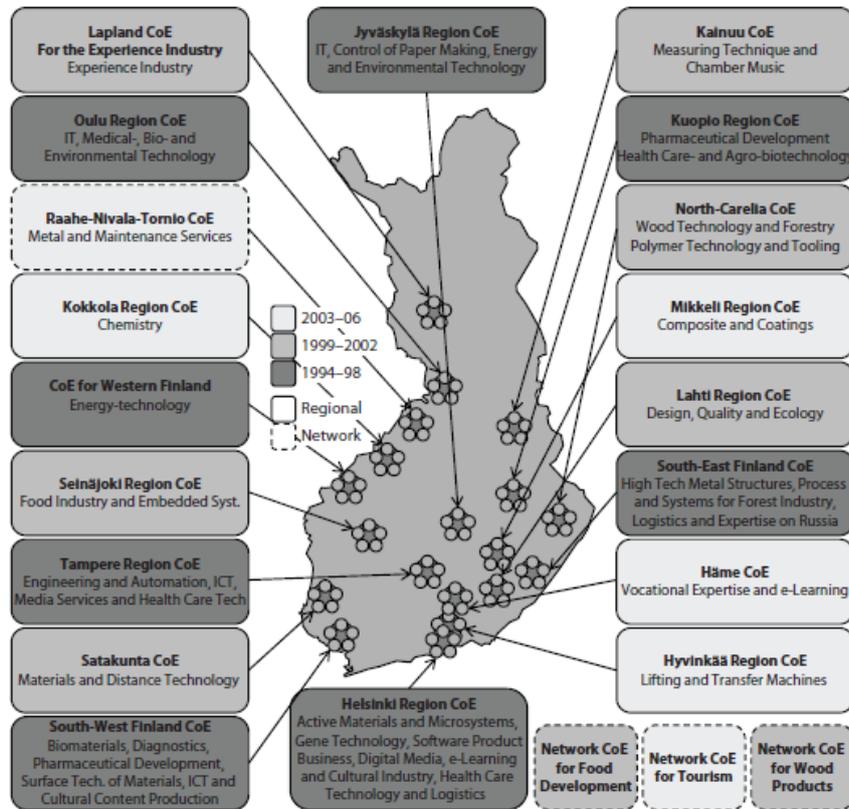


Figure 38: Centres of Expertise

In the course of the years the nature of centres of expertise has changed. While at the beginning the centres focused on the development of regional resources they have transformed from development organizations into expert organizations in their corresponding areas of competence. They have achieved a strong position not only regionally, but in many cases also nationally. However, collaboration among centres from different regions has remained weak and from an international perspective they were still relatively minor players.

The OSKE program 2007-2013

Started as regional development program the OSKE program therefore needed to be adapted in order to overcome the challenges faced by the centres of expertise. Key challenges included the effective utilization of regional synergies, the development of common operating models, the identification and development of internationally significant clusters as well as international cooperation in research and development projects. In its current term the OSKE program is expected to focus activities and create synergies between centres of expertise.

The key feature of the new OSKE program is not to create new clusters, but to coordinate already existing regional clusters, the Centres of Expertise that were created until 2006, through a new “umbrella organization” called Competence Cluster.

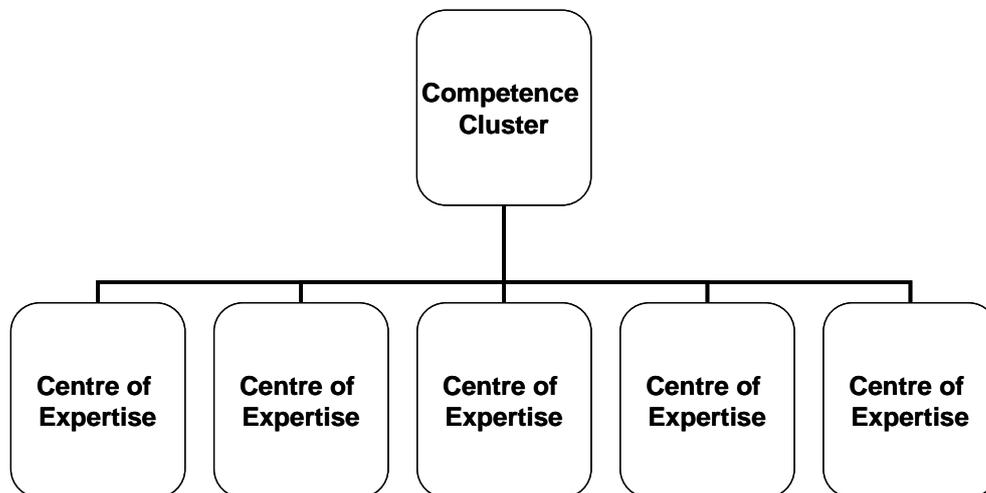


Figure 39: The organization of a Finnish Competence Cluster

Competence Clusters as Umbrella Organizations for Centres of Expertise

Superordinated to the centres of expertise the program established competence clusters that gather the key organizations at centres of expertise located in different regions, to collaborate and implement strategic development programs. A competence cluster will enable the more effective utilization of fragmented national expertise-based resources and, at the same time, increase the 'critical mass' required for research and product development thereby creating more attractive centres of expertise. Competence clusters will collect currently fragmented regional resources, make their utilization more efficient, and create a new, effective channel for the dissemination of knowledge and expertise for the benefit of regional business and research. A national, cluster-based alliance of the best centres of expertise will channel the attention of the regions away from competition with each other and towards intensifying international competition. Cluster-based collaboration among centres of expertise will also sharpen regional specialization and the division of duties. Networking will also encourage universities to specialize in strong fields of research, and thereby also to increase co-operation between institutes located in different regions.

Managed by a cluster coordinator, who is based at a Centre of Expertise, a competence cluster comprises complementary fields of expertise of at least two centres of expertise located in different areas. Today the program is implemented by 13 national competence clusters (see Figure 40), each of which comprises four to seven regional centres of expertise.⁵⁹ Rather than aiming comprehensively to develop entire industrial sectors, a competence cluster seeks to develop its more functional fields of top-level expertise or promising new sectors worthy of development, through which the centres can work together to develop the competitiveness and business of the whole

⁵⁹ For further information about the different competence clusters please see www.oske.net/en/competence_clusters/.

cluster. The fields of expertise contained in the clusters may include not only technology-based sectors but also other areas such as the service sectors or the so-called creative sectors.

A competence cluster must have a management team that controls and supervises cluster (and coordinator) activity. If necessary, a cluster may also have a broader-based committee that meets less often, and which sets operational targets and encourages the commitment of different organizations.

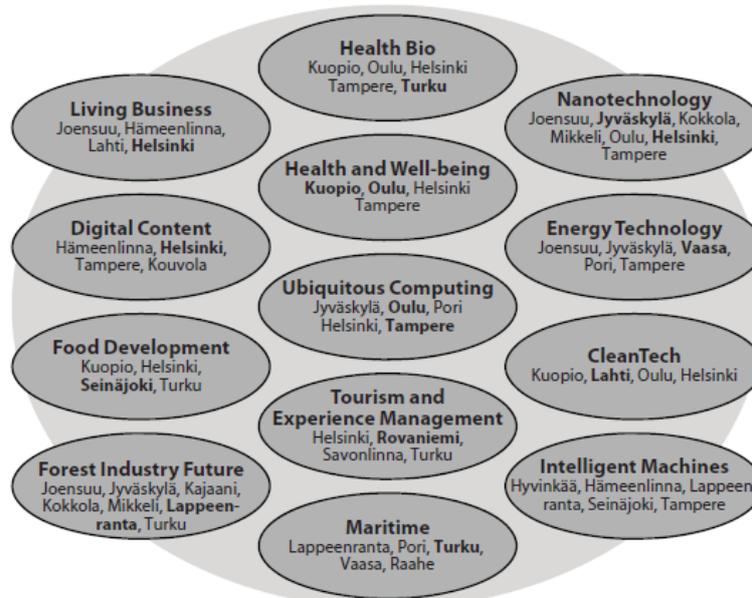


Figure 40: Competence Clusters

The role of the Centres of Expertise in a Competence Cluster

A Centre of Expertise represents top-class expertise in terms of a nationally significant and high-level cluster of skills. A Centre of Expertise is a network of organizations in a region, which, together with other parties in the competence cluster, implements the national Centre of Expertise Program, relying in its operations on the region’s network of companies, universities, research institutes and technology centres. The objectives and procedures of centres of expertise are defined based on the needs and opportunities of companies and other participants in the innovation system, both at a regional and cluster level.

The functions of a Centre of Expertise include:

- To utilize and disseminate top-class expertise within their competence cluster and region,
- To increase collaboration among companies, high-level research and education and other public bodies in strategically important fields of expertise,
- To create a long-term strategy for innovation based on the needs and opportunities in the region together with other centres of expertise in the cluster,

- To prepare a wide range of company-based public-private projects for the implementation of innovation strategy (Competence Cluster Program) and to accelerate regional development,
- To catalyze growth and internationalization in existing companies with development potential, and to boost the use of public and private innovation services, and
- To promote the development of creative innovation environments, characterized by effective collaboration and a dynamic of constant development.

A centre of expertise must have a management team that controls and supervises the activity of the implementing organization during the program. A centre of expertise may also have a committee that sets operational targets and encourages the commitment of different organizations in the region.

The objectives of the OSKE Program

The overall objective of the OSKE program is

- To create new innovations, products, services, companies and jobs based on top-class expertise,
- To support inter-regional specialization and division of duties in order to create internationally competitive centres of expertise and
- To increase the attraction of regional innovation environments in order to lure international companies, investments and leading experts to the region.

In order to achieve these objectives the OSKE program

- Will focus on the development of selected competence clusters and internationally high-level centres of expertise,
- Will utilize top-class regional expertise to strengthen the longer-term competitiveness of companies and to create new business,
- Will increase the national and international networking of centres of expertise,
- Will collect any regional, national and EU resources available for the development of selected key sectors and
- Will ensure the regions are better prepared to utilize nationally and internationally tendered R&D funding.

2.5.1.2 Target Group of the Program

Target group of the program are Centres of Expertise.

2.5.1.3 Term of the Program, Financial Aspects and Application Procedure

Term of the program	2007-2013
Budget	
Type of funding	Grant funding
Does the program have a specific technology focus?	No
Are there calls for proposals?	No
Is there a dialogue with applicants about the improvement of their application prior to the final submission of the application?	Yes
Maximum funding period for a project	12 months
Is there a maximum amount of funding an applicant can apply for?	EUR 140,000
Financing structure of projects	<ul style="list-style-type: none"> • Combination of public funding from different national ministries and regional authorities • Max. 50% from the OSKE program
Most important evaluation criteria for project proposals	<ul style="list-style-type: none"> • Impact on industry sector and companies • Knowledge and/or technology transfer

2.5.1.4 Instruments

Basic funding is intended for the development of competence clusters and their related centres of expertise approved for the program. Basic state funding can be used for the co-ordination of competence clusters and centres of expertise (the organization, administration and communication of co-operation between organizations), as well as for the preparation of projects based on the program aims and for partial funding of top-level projects.

2.5.1.5 Results and Impact of the Program

The OSKE program strengthens collaboration between Centres of Expertise and thus contributes to the further strengthening and exploitation of regional innovation potentials. The program has activated the regions to focus on their strengths and helped them to understand themselves as a part of the national system of innovation. Although expectations regarding larger and more “powerful” projects have not been fully met yet (it is expected that the expectations will be met in the future as the development of such projects takes some time), the program has been already successful in facilitating cross-sectoral projects.⁶⁰ The reason for the small number of projects that reflect a critical mass for “large-scale” innovations might be found in the fact that “many stakeholders do not consider all Centres of Expertise in the competence clusters to be of excellent quality. Regional

⁶⁰ Email information from Riikka Pellikka and Pirjo Kutinlathi, Ministry of Employment and the Economy

policy considerations have led to the selection of clusters that are not considered to be excellent. [...] The difference in quality hampers the collaboration between the Centres of Expertise within a particular Competence Cluster”.⁶¹ Thus, the program supports a number of “sub-critical clusters [...] which cannot (yet) be labeled as excellent clusters ready for international competition”.⁶² However, “[the] umbrella function of the OSKE program helps fostering the linkages between companies in more ‘remote’ areas and companies in the more advanced urban areas”.⁶³

2.5.1.6 Monitoring and evaluation system

The following main indicators are used to measure the performance of the program:

Indicators	
Output	<ul style="list-style-type: none"> • Jobs • New networks • Products • Services • Processes
Results	<ul style="list-style-type: none"> • Competitive funding from national and international networks and resources
Impact	<ul style="list-style-type: none"> • Better employment • Economic growth

Beneficiaries are monitored by means of regular written reports, regular meetings with the program owner, regular independent evaluations and regular independent benchmarking exercise.

Independent evaluations of the program are carried out every three years.

2.5.1.7 Context of the program

The OSKE program is an important pillar of the national innovation policy and in particular of the national regional development strategy. It is the key program in terms of developing regions by using a cluster approach. The program is a mix of supporting bottom-up driven regional cluster development and a centralized approach in which the national government supports specific national industries by using technological criteria or network-quality criteria as a basis for a decision on support.⁶⁴

⁶¹ Patries Boekholt, 2010: The OSKE Program in International Perspective, in: Ministry of Employment and the Economy, 2010: Osaamisklusterit alueiden voimien yhdistäjänä. Osaamiskekusohjelman (2007-2013) väliarviointi, pp. 35-36)

⁶² Ibid., pp. 37-38

⁶³ Ibid. p. 38

⁶⁴ Ibid., p. 35

How important is the cluster program in relation to...	0	1	2	3	4
...the overall national economic/industrial development strategy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
...other R&D/innovation programs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

0 = not important at all ⇒ 4 = very important

Table 30: Relevance of the OSKE program in the overall policy setting

The coordination of the program with other funding programs depends on the policy field. While coordination with other national R&D programs is assessed as good, coordination with infrastructure programs and in particular with business development programs should be improved in order to have increased synergies between the different programs.

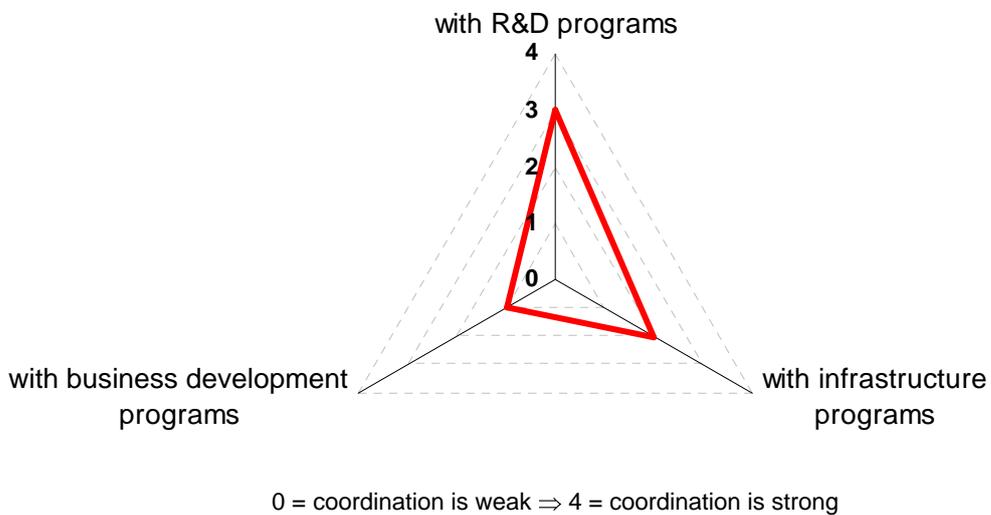


Figure 41: Coordination of the OSKE program with other Finnish funding programs

2.5.2 Strategic Centres for Science, Technology and Innovation (SHOK, Strategisen huippuosaamisen keskittymät)

Name of program	Strategic Centres for Science, Technology and Innovation (SHOK, Strategisen huippuosaamisen keskittymät)
Country	Finland
Contact details	<p>Tekes – The Finnish Funding Agency for Technology and Innovation</p> <p>Marita Paasi</p> <p>Kyllikinportti 2</p> <p>FI-00101 Helsinki</p> <p>Tel.: +358 1060 55 724</p> <p>Email: marita.paasi@tekes.fi</p>
Internet	www.tekes.fi/en/community/Strategic Centres for Science_ Technology and Innovation/360/Strategic Centres for Science_ Technology and Innovation/1296

2.5.2.1 Objectives and Rationale of the Program⁶⁵

The SHOK program's roots are in a Government resolution of April 7th, 2005 concerning the structural development of the public research system. This resolution called for a national strategy to create and consolidate internationally competitive centres of excellence in science, technology and innovation (STI) under the supervision of the Science and Technology Policy Council of Finland. The strategy to set up the Strategic Centres for Science, Technology and Innovation (SHOK) program was presented in June 2006.

The **overall objective of the program** is 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. It was decided to establish Strategic Centres in the areas of energy and environment, metal products and mechanical engineering, forest cluster, health and well-being and ICT industries/services.

In order to achieve the overall objective the following **operational objectives** have to be achieved by the program:

1. Leading Finland-based enterprises, universities, research institutes and financing organizations commit themselves to the activities and objectives of the Centres and allocate resources in the long term to strategically chosen, top-quality Centres of an international standard.

⁶⁵ Science and Technology Policy Council of Finland, 2006: Strategic Centres of Excellence in STI and Tekes website ([www.tekes.fi/en/community/Strategic_Centres_for_Science__Technology_and_Innovation_\(SHOK\)/360/Strategic_Centres_for_Science__Technology_and_Innovation_\(SHOK\)/1296](http://www.tekes.fi/en/community/Strategic_Centres_for_Science__Technology_and_Innovation_(SHOK)/360/Strategic_Centres_for_Science__Technology_and_Innovation_(SHOK)/1296)).

2. Centres engage in dynamic and interactive RDI activities, the results of which will be exploited efficiently and extensively. Research activities of the Centres will anticipate the needs of society and the business sector over a time span of five to ten years.
3. High quality competence in STI and its reputation attract innovative and globally leading enterprises and top-ranking experts to Finland.

Strategic Centres for Science, Technology and Innovation are selected for support from the SHOK program if they meet the following criteria:

- The Strategic Centres of Excellence in STI have to be very significant with regard to their potential for the national economy and society as well as their R&D investment.
- The centres must have sufficient human and financial resources at their disposal. As soon as their operation has been established and stabilized, the overall financial volume of each centre should be some EUR 50–100 million per annum, depending on the subject area and activities.
- The centres must be based on applications that are vital with regard to the future of the field in question. Application-based approach means that the RDI activities of each centre are based on a combination of a variety of competences. The important role of innovation activities also presumes that the centres are supplemented by operational environments, where new applications and ideas can be piloted and tested in circumstances that are as real as possible.
- The core competence for the centres must be found in Finland. All centres must have the potential to be among the best in the world. The centres must be internationally credible and renowned, and they must be able to attract the best experts and enterprises in the field throughout the world. Therefore, they must be globally networked and co-operate actively in the international framework.
- The centres are based on the strong commitment of the key enterprises, universities, research institutes, financiers and ministries in the respective subject areas. Their operations and funding are long-term by nature. This facilitates the centres to maintain their competitive edge. The centres and parties involved must have a clear, shared and goal-oriented vision and a focused strategy.

2.5.2.2 Operation of the Strategic Centres for Science, Technology and Innovation

Each Strategic Centre has a multidisciplinary outlook and involves different sectors industry and society. Research and its commercialization through new technologies and innovations are at the core of the centre's work that is guided by a centre-specific research program. Through their research programs, which are jointly developed by the stakeholders of the centres, the centres are expected to generate sufficient critical mass and combine versatile competences for achieving world-class expertise and global breakthroughs. They should facilitate long term strategic research and contribute to speeding up of the innovation process. Research carried out by the centres is strategic, pre-commercial and as a rule not associated with short-term market goals. The research aims to meet the needs of Finnish industry and society within a five-to-ten-year period.

The activities of a centre are coordinated by a non-profit limited company that is jointly owned by the stakeholders of the centre including relevant companies, universities and research institutes. In

addition each centre hosts also a virtual research organization. Centres provide a permanent cooperation and interaction forum for companies and research organizations. Technology, service providers and end-users cooperate in the research programs of the individual centres, which promote demand and user orientation of innovation processes. Centres will also act as gateways to international cooperation and as avenues for training and recruitment. Tekes also participates in the coordination of the centres as a whole and in the cooperation forum between the centres.

Public funding organizations have made a commitment to providing funding for the centres in the long term. Tekes and the Academy of Finland⁶⁶ are key public funding providers of the centres. While Tekes supports the centre’s research programs and projects initiated by companies, the Academy of Finland funds research carried out in the areas of the centre’s fields of activity.

2.5.2.3 Target Group of the Program

Groups of relevant companies, universities and research institutes.

2.5.2.4 Term of the Program, Financial Aspects and Application Procedure

Term of the program	Since 2006
Budget	EUR 180 million p.a.
Type of funding	Grant funding and loans
Does the program have a specific technology focus?	Yes (energy and environment, metal products and mechanical engineering, forest cluster, health and well-being and ICT industries/services).
Are there calls for proposals?	No. Project applications can be submitted at any time.
Is there a dialogue with applicants about the improvement of their application prior to the final submission of the application?	Yes
Maximum funding period for a project	60 months
Is there a maximum amount of funding an applicant can apply for?	There is no maximum amount.
Financing structure of projects	<ul style="list-style-type: none"> • Up to 75% contribution from the SHOK program for the establishment of the centres and research carried out by them. • In addition to the SHOK funding additional research/innovation projects are financed from other national programs (e.g. the Academy of Finland) or EU programs. • Overall companies are expected to co-fund an

⁶⁶ The Academy of Finland funds high-quality scientific research and acts as a science and science policy expert. For further details please see www.aka.fi/en-GB/A/Academy-of-Finland/.

	average of 40% of the research.
Most important evaluation criteria for project proposals	<ul style="list-style-type: none"> • Impact on industry sector and companies • Impact on society • Knowledge and/or technology transfer

2.5.2.5 Instruments

Financial support is provided for the establishment of the centres and the research carried out by them. Tekes is also providing technical support through coordinating the centres as a whole and participation in the cooperation forum between the centres.

2.5.2.6 Results and Impact of the Program

There are six Strategic Centres for Science, Technology and Innovation in the areas of energy and environment, metal products and mechanical engineering, forest cluster, health and well-being and ICT industries/services.⁶⁷ 128 companies are involved in the centres which have set up a total of 13 research programs (figures of 2009). Within each Strategic Centre, some EUR 40-60 million annually are invested in research.⁶⁸ An evaluation of the results and the impact of the program will be carried out in 2012-2013.

2.5.2.7 Monitoring and evaluation system

The following main indicators are used to measure the performance of the program:

Indicators	
Output	<ul style="list-style-type: none"> • Creation of new public-private partnerships • Creation of joint long-term strategic research • Increase in R&D investments and resources • Increase in quality, risk level and areas of RTI activities
Results	<ul style="list-style-type: none"> • Results of the SHOK RTI programs: <ul style="list-style-type: none"> ▪ New products and services, process innovations, patents, internationalization and networking effects, growth and innovations in businesses • Results of the SHOK cluster program: <ul style="list-style-type: none"> ▪ Increased cooperation and visibility of clusters, speeding-up of innovation processes
Impact	<ul style="list-style-type: none"> • Renewal of clusters and industries

⁶⁷ For an overview of the centres please see www.tekes.fi/en/community/Strategic_Centres_for_Science__Technology_and_Innovation_%28SHOK%29/360/Strategic_Centres_for_Science__Technology_and_Innovation_%28SHOK%29/1296.

⁶⁸ www.tekes.fi/en/community/How_do_Strategic_Centres_work/631/How_do_Strategic_Centres_work/1557

- Creation of new national competence areas
- Promotion of economic growth and employment

Beneficiaries are monitored by means of regular written reports, regular meetings with the program owner and regular independent evaluations.

An evaluation of the whole SHOK program as well as of individual SHOK clusters is being planned during 2011 and will be executed in 2012-2013. The final set of indicators to be used in the evaluation is under preparation.

2.5.2.8 Context of the program

The relevance of the SHOK program in the overall policy setting is very high which also reflects in a good coordination with other programs (see table and figure below)

How important is the cluster program in relation to...	0	1	2	3	4
...the overall national economic/industrial development strategy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
...other R&D/innovation programs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

0 = not important at all ⇒ 4 = very important

Table 31: Relevance of the SHOK program in the overall policy setting

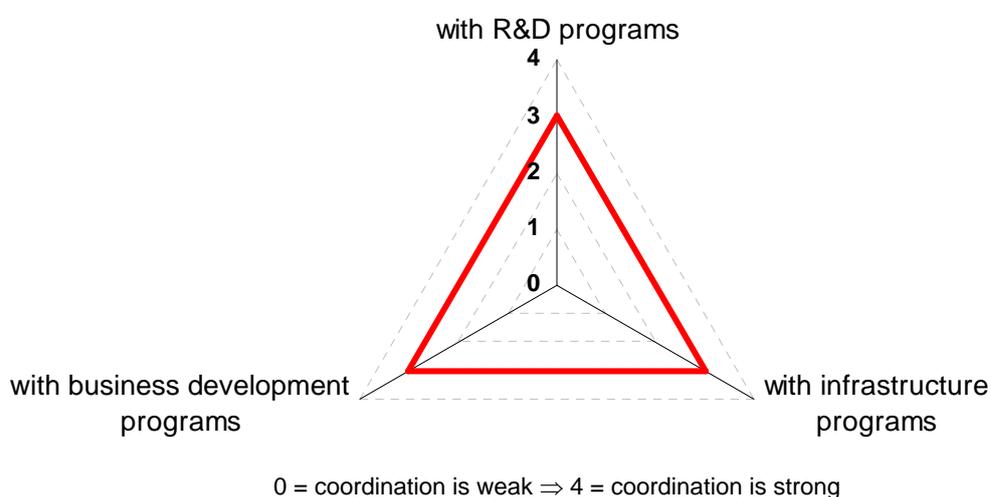


Figure 42: Coordination of the SHOK program with other Finnish programs

2.6 Iceland

2.6.1 Vaxtarsamningur (Growth Agreements)

Name of program	Vaxtarsamningur (Growth Agreements)
Country	Iceland
Contact details	Ministry of Industry, Energy and Tourism Elvar Knútur Valsson Arnarhvoli IS-150 Reykjavík Tel. +354 545 8500 Fax +354 562 1289 Email: elvar.knutur.valsson@idn.stjr.is
Internet	www.vaxvest.is, www.vaxtarsamningur.is

2.6.1.1 Objectives and Rationale of the Program

The **overall objective of the program** is 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. In order to achieve this objective the program pursues the following **operational objectives**:

- Strengthening of cooperation among companies, universities and government agencies to enhance innovation and development for companies and industries;
- Promotion and support of clusters and cluster initiatives in the region and regional expertise in predefined strongholds;
- Increasing the number of companies, jobs and supply of regional products and services;
- Support of export promotion activities;
- Participation in international projects with the aim of supporting regional strongholds;
- Attracting foreign direct investment and expertise knowledge.

The program puts specific emphasis on the support of regional competitive advantages, such as renewable energy, food, tourism, fisheries, agriculture, health technology, clean-tech and biotech.

In order to implement the program the Ministry of Industry concludes so-called “Growth Agreements” with regional development agencies. These growth agreements detail responsibilities of both ministry and regional development agency. While the ministry’s role is restricted to supervising and the provision of funds for projects, the actual implementation lies with the regional development agency:

- The Ministry of Industry appoints five persons to a management board of each growth agreement and finances up to 50 per cent of eligible costs of individual projects that are developed in the context of the growth agreements.

- The regional development agency is responsible for the execution of the growth agreement. They publish open calls for proposals, process grant applications and propose projects to the management board for final evaluation. Administrative costs of the growth agreements shall be paid from the annual budget of the regional development agency that is financed through the state general budget.

2.6.1.2 Target Group of the Program

The target group of the program includes companies, R&D institutions, universities and municipalities that collaborate in joint initiatives for the benefit of regional development.

2.6.1.3 Term of the Program, Financial Aspects and Application Procedure

Term of the program	2010-2013 (current funding period)
Budget	EUR 3.8 million (ISK 645 million)
Type of funding	Grant funding
Does the program have a specific technology focus?	No
Are there calls for proposals?	Three times a year
Is there a dialogue with applicants about the improvement of their application prior to the final submission of the application?	Yes
Maximum funding period for a project	There is no maximum funding period
Is there a maximum amount of funding an applicant can apply for?	There is no maximum amount.
Financing structure of projects	<ul style="list-style-type: none"> • Up to 50% funding from the program
Most important evaluation criteria for project proposals	<ul style="list-style-type: none"> • Impact on industry sector and companies • SME focus or SME participation in activities • Structure and members of consortium

2.6.1.4 Instruments

The program provides **grant funding** for projects that focus on innovation, research and development with clear focus of marketing/sale/exporting new or improved product and/or services.

Eligible costs include for example wages and benefits, external services, travel and meeting costs, marketing research, business planning, product/service development and export activities. The growth agreement does not finance investment in materials, equipment or other inputs which is part of product for sale as well as investment in production processes incl. buildings and related equipment.

2.6.1.5 Results and Impact of the Program

As of 2009 15 cluster organizations benefited from the program. 300 SME and 10 Non-SME as well as three universities and nine research institutions and 30 public entities participated in the one of the clusters. 16 R&D projects were supported by the program in 2009. Program officials label the program as quite successful in terms of R&D investment, new products/services, growth of employment, skills development and growth of the cluster initiatives (see figure below).

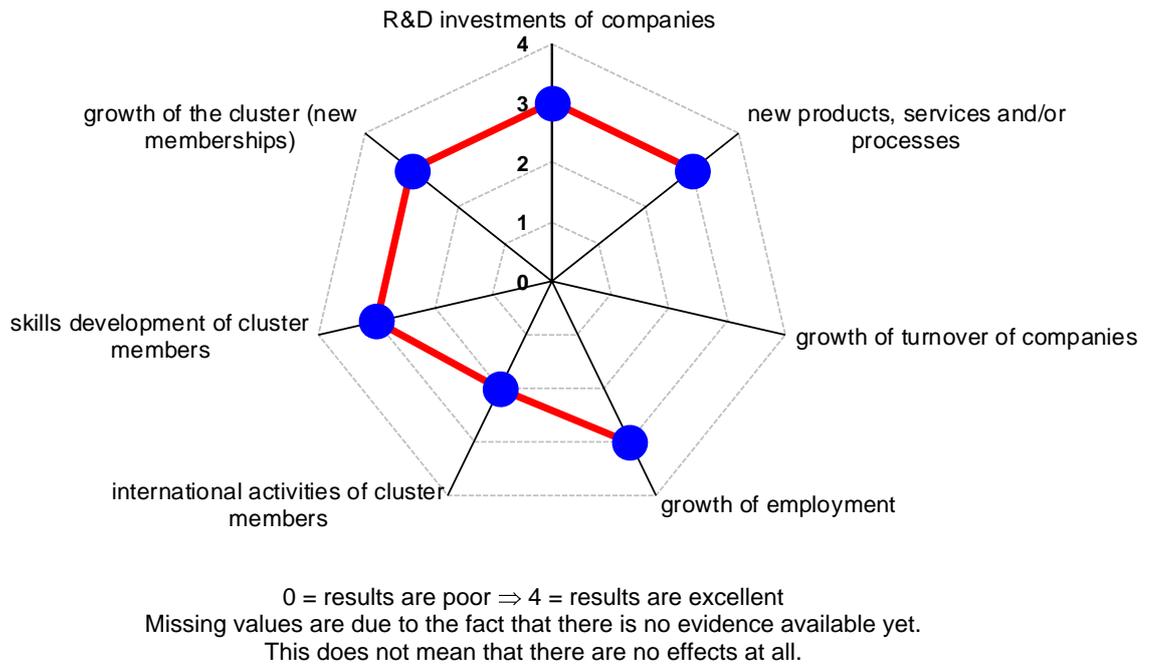


Figure 43: Results of the program that were achieved in 2009

2.6.1.6 Monitoring and evaluation system

The program is evaluated every 24 months.

The following indicators are used to monitor the performance of the program:

Indicators	
Output	<ul style="list-style-type: none"> • Number of new products and/or services • Number of PhD projects beneficial to private sector/cluster initiative in the region • Number of spin-offs • Qualitative measures: measuring of the economic value of the above mentioned indicators
Results	<ul style="list-style-type: none"> • Number of cooperative/joint projects between companies • Number of triple-helix projects • Total number of companies actively participating in projects • Average number of participating companies in supported projects

	<ul style="list-style-type: none"> Participating companies matching grant: private vs. public funding in per cent Total amount of international grants/funding received (competitive calls for example) Average budget of supported projects
Impact	<ul style="list-style-type: none"> Number of jobs created linked to cluster initiatives Number of spin-offs/start-up companies Effect on unemployment rate Qualitative indicator: perception of benefits (participants, stakeholders)

Beneficiaries are monitored by regular written reports prepared by the beneficiary, by regular meetings with the program owner and regular independent evaluations.

2.6.1.7 Context of the program

Although the program is an important regional development program of the Ministry of Industry, Energy and Tourism, it has a rather medium relevance in the context of the overall national policy setting.

How important is the cluster program in relation to...	0	1	2	3	4
...the overall economic/industrial development strategy?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
...other R&D/innovation programs?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>

0 = not important at all ⇒ 4 = very important

Table 32: Relevance of Vaxtarsamningur in the overall policy setting

According to program officials the coordination of the program is neither weak nor strong. However, improvements in terms of effectiveness and efficiency of the program might be achieved through an improved coordination.

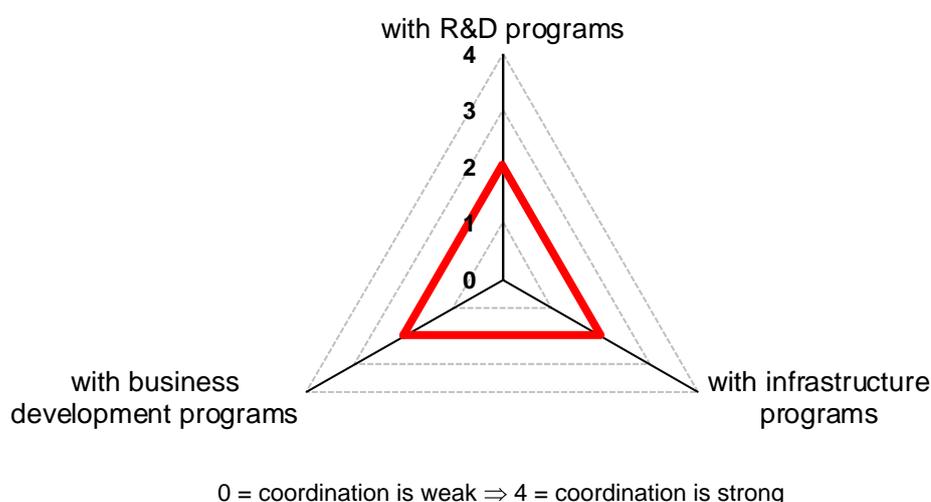


Figure 44: Coordination of Vaxtarsamningur with other national funding programs

2.6.2 Strategic Research Program for Centres of Excellence and Research Clusters

Name of program	Strategic Research Program for Centres of Excellence and Research Clusters
Country	Iceland
Contact details	The Icelandic Centre for Research (RANNIS) Thorvaldur Finnbjörnsson Head of Analysis, Evaluation and Indicators Laugarvegi 13 IS-101 Reykjavik Tel. +354 515 5808 Email: thorvald@rannis.is
Internet	www.rannis.is

2.6.2.1 Objectives and Rationale of the Program

In December 2007 the Icelandic Science and Technology Policy Council (STPC) issued a decision that identified scientific and economic areas in which the country has the potential to achieve global competitiveness.⁶⁹ The collaboration of companies, universities, public institutions and social groups was considered as a key success factor in this regard. The STPC also concluded that high quality manpower, facilities and equipment is not available across all fields of science in a community counting approx. 5 thousand FTE's in research. International cooperation and interdisciplinary efforts are important countermeasures.

The STPC decision identified the following areas respectively actions as important spheres of activity:

- Reinforcing research on education with a view to develop the educational system and make it respond more swiftly to increasing demands of knowledge, efficiency, creativity, initiative and flexibility.
- Promoting innovation as a feasible alternative for investment and to encourage domestic and foreign investors to engage in the support of innovative companies including SMES.
- Facilitating research on the national heritage its old manuscripts, literary culture, language and contemporary culture along with the present emphasis on international efforts and image of Iceland as a dynamic forward-looking nation.
- Boosting research into successful alternatives in preventive efforts against social epidemics as well as in health improvement, rehabilitation, novel approaches in health services, pharmaceuticals and safe food.

⁶⁹ The Science and Technology Policy Council of Iceland: Challenges and Objectives in Science, Technological Development and Innovation, December 2007

- Increasing research in support of a sustainable utilization of natural resources on land, offshore and in the ocean.
- Increasing multidisciplinary research with extensive private support into the probable and extensive impacts on the natural and social environment through global warming.
- Increasing research on the infrastructures of our society with emphasis on its characteristics and uniqueness.
- Increasing attention towards creative industries in which innovation, on-the edge information technology, cultural activities and entertainment merge with economic activities and investment, creating new companies and job opportunities.

In this context the Icelandic Centre for Research (RANNIS), a government agency that reports to the Ministry of Education, Science and Culture, set up the program “**Strategic Research Program for Centres of Excellence and Research Clusters**” in 2008. The **overall objective of this program** is 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. The centres of excellence or the research clusters that will receive financial support should have the chance to be outstanding internationally.

In a first round RANNIS called for proposals for centres of excellence or research clusters. To further develop these proposals up to ten of them could be supported with a grant of EUR 5,600 (ISK 1,000,000). They were offered to submit full proposals by October 2008. As of 2009, two to four grants will be offered for research and innovation collaboration. The maximum grant amount is 80 million ISK per year for up to seven years. Funding was eventually granted to three Centres of Excellence and Research clusters: GEORG – Geothermal Research Group, IIM – Icelandic Institute for Intelligent Machines and EDDA – Centre of Excellence in Critical Contemporary Research at the University of Iceland.

2.6.2.2 Target Group of the Program

Target group of the program includes cluster-like collaborations between companies, universities and research institutions.

2.6.2.3 Term of the Program, Financial Aspects and Application Procedure

Term of the program	2009-2015
Budget	EUR 6.8 million (ISK 1.12 billion)
Type of funding	Grant funding
Does the program have a specific technology focus?	No
Are there calls for proposals?	Yes (there was a call at the beginning of the program)
Is there a dialogue with applicants about the improvement of their application prior to the final submission of the application?	Yes

Maximum funding period for a project	7 years
Is there a maximum amount of funding an applicant can apply for?	EUR 3.4 million (ISK 560 million)
Financing structure of projects	<ul style="list-style-type: none"> • Up to 25 per cent
Most important evaluation criteria for project proposals	<ul style="list-style-type: none"> • Impact on industry sector and companies • Impact on society (non-economic effects) • SME focus or SME participation in activities • Technology or scientific area of cluster • Knowledge and/or technology transfer

2.6.2.4 Instruments

The program provides grant funding to support the establishment/operation of a cluster management organization, collaborative R&D projects, commercialization of research results, SME participation, training and education and internationalization activities.

2.6.2.5 Results and Impact of the Program

Due to the young age of the program (it started in 2009) there are no results and impacts measurable at the moment. Funding is provided for three Centres of Excellence and Research clusters: GEORG – Geothermal Research Group, IIIM – Icelandic Institute for Intelligent Machines and EDDA – Centre of Excellence in Critical Contemporary Research at the University of Iceland. All in all they include eight SME, three Non-SME, two universities, two R&D institutions and three training and education providers.

2.6.2.6 Monitoring and evaluation system

The program will be evaluated after three years.

The following indicators are used to monitor the performance of the program:

Indicators	
Output	<ul style="list-style-type: none"> • Publications • Trainees • Start-ups
Results	<ul style="list-style-type: none"> • Increased number of scientists in specific fields • Increased number of jobs • Increased number of start-ups • Educational benefits • International cooperation

Impact	<ul style="list-style-type: none"> • Sustainable clusters in the supported areas • Social and economic impact • Increased competitiveness in supported areas • International networking
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Beneficiaries are monitored by written reports, regular meetings with the program owner and by regular independent evaluations.

2.6.2.7 Context of the program

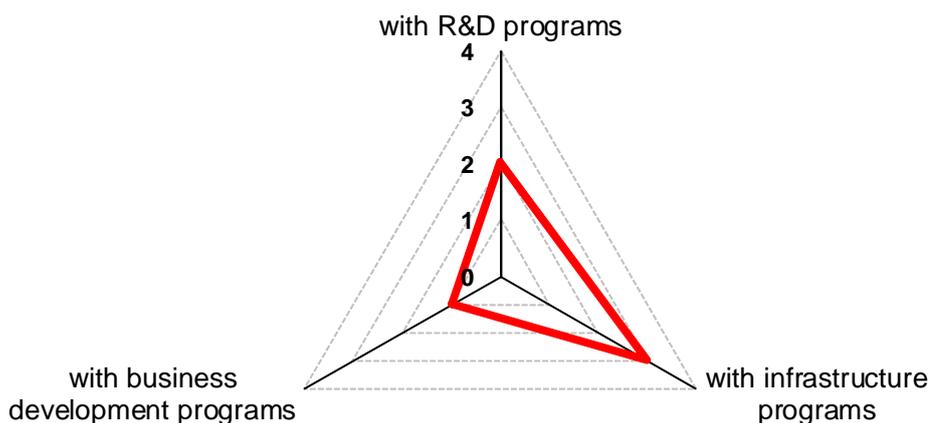
According to program officials the program is due to its “cluster nature” at an experimental stage. Although quite important from a policy point of view the moderate budget limits its relevance in terms of the overall policy setting.

How important is the cluster program in relation to...	0	1	2	3	4
...the overall economic/industrial development strategy?	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...other R&D/innovation programs?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>

0 = not important at all ⇒ 4 = very important

Table 33: Relevance of the Strategic Research Program for Centres of Excellence and Research Clusters in the overall policy setting

Asked about the coordination of the program with other funding programs program officials reported a good coordination with infrastructure programs, while the coordination with business development programs was assessed as rather weak.



0 = coordination is weak ⇒ 4 = coordination is strong

Figure 45: Coordination of the Strategic Research Program for Centres of Excellence and Research Clusters with other funding programs

2.7 Poland

2.7.1 Polish Cluster Support

Name of program	Polish Cluster Support (different programs)
Country	Poland
Contact details	Polish Agency for Enterprise Development Grażyna Buczynska Chief Expert Innovation and Technology Unit ul. Pańska 81/83 PL-00-834 Warszawa Tel. +48 22 432 80 80 Fax +48 22 432 62 20 Email: grazyna_buczynska@parp.gov.pl
Internet	www.parp.gov.pl

2.7.1.1 Objectives, Rationale, Target Groups and Instruments

The Polish government considers the support of clusters as “an important component element in several spheres of economic policy, most especially those connected with innovation, regional development and industry”.⁷⁰ A specific feature of cluster policy in Poland is the interest of the government in linking clusters and cluster policy more closely with the development of special economic zones.⁷¹ These are areas in which business activity may be conducted under preferential conditions defined by the Act on Special Economic Zones of 20 October 1994.⁷² On September 4th 2006 the government adopted the “Strategy for Increasing the Innovativeness of the Economy, 2007-2013” that identified the need of support for clusters.

The support of clusters is provided by a set of **different grant funding and technical assistance programs respectively projects**. They include:

- The **Innovative Economy Operational Program, Measure 5.1 “Support of the Development of supra-regional clusters”**, addresses cluster coordinators to support investments, training, advisory services and internationalization activities. The budget of this program (only Measure 5.1 of the Innovative Economy Operational Program) is EUR 104.3 million in the period 2007-2013).

The overall objective of this measure is to support the development of national clusters and to enhance the competitive position of companies through supporting collaborative relationships

⁷⁰ Ministry of Economy, 2010: National Reform Programme: Europe 2020 – Clusters: Cluster-based Economic Development Policy, p. 2

⁷¹ Ibid., p. 13

⁷² For an overview see Polish Information and Foreign Investment Agency (PAIiZ), 2009: A Guide to Special Economic Zones in Poland

between companies and between companies and business environment institutions, including scientific institutes. Support is available to coordinators of such collaborations (cluster coordinators) who do not operate for profit or allocate the profit for objectives relating to tasks pursued by the Polish Agency for Enterprise Development. Beneficiary may be a foundation, registered association, joint-stock company, limited-liability company, R&D institution or an organization of entrepreneurs. To be eligible a project should involve at least 10 companies of which are at least 50 per cent SME and at least one R&D institution and one business support institution. In order to facilitate the development of supra-regional clusters project participants have to come from at least two voivodeships (provinces) and their total share in sales outside this region must be at least 30 per cent.

The maximum amount of co-financing per project (can be up to 100 per cent of total project costs) is EUR 5 million (PLN 20 million) for investments, EUR 250,000 (PLN 1 million) for training that is related to the investments, 5 per cent of the total eligible expenditure for operational and administrative expenses, EUR 100,000 (PLN 400,000) for advisory services.

- To support the **development of regional clusters** the government has set up the **Operational Program Development of Eastern Poland 2007-2013, Priority 1.4 “Promotion and cooperation” with Measure 1.4 “Cooperation – cluster creation and development”**. The program is restricted to the Eastern part of the country, namely on the voivodeships of Warmińsko-Mazurskie, Podlaskie, Lubelskie, Świętokrzyskie and Podkarpackie. Main beneficiary is a cluster manager who coordinates a cluster consisting of entrepreneurs, universities and innovation and regional development agencies. The program has a budget of EUR 11 million and supports projects with a minimal value of EUR 500,000 (PLN 2 million) with a maximum share of program co-funding of 75 per cent.
- In order to support the establishment and development of clusters through grant funding in the context of the programs that were briefly described above, there is also a range of different technical assistance projects. These projects are like the grant programs part of a nationwide development program which in this particular case is the Operational Program Human Capital, Measure 2.1.3 “Development of adaptation potential of human resources and enterprises”. Completed and still on-going technical assistance measures are:
 - To provide clusters and their managers with information on the possibilities for improved performance and to deepen the knowledge on the development status and potential of Polish clusters PARP commissioned a benchmarking project in 2008. The results were published in 2010.⁷³
 - PARP has organized numerous regional conferences, cluster exhibitions and working groups dealing with cluster issues to facilitate the exchange of information and the creation of projects. Furthermore, PARP has published reports and translated foreign cluster publications into Polish language.
 - In the context of the PARP project “Cooperation linkages of Polish enterprises” trainings and advisory services were offered for cluster coordinators and employees of companies that are cluster members or potential cluster members.

⁷³ Polish Agency for Enterprise Development, 2010: Benchmarking klastrów w Polsce – 2010

2.7.1.2 Term of the Programs, Financial Aspects and Application Procedures

The following tables provide information on the two grant programs:

- Innovative Economy Operational Program, Measure 5.1 “Support of the Development of supra-regional clusters”
- Operational Program Development of Eastern Poland 2007-2013, Priority 1.4 “Promotion and cooperation” with Measure 1.4 “Cooperation – cluster creation and development”.

Name of the program	Innovative Economy Operational Program, Measure 5.1 “Support of the Development of supra-regional clusters”
Term of the program	2007-2013
Budget	EUR 104 million
Type of funding	Grant funding
Does the program have a specific technology focus?	No
Are there calls for proposals?	Twice a year
Is there a dialogue with applicants about the improvement of their application prior to the final submission of the application?	Yes
Maximum funding period for a project	There is no maximum funding period.
Is there a maximum amount of funding an applicant can apply for?	EUR 5 million
Financing structure of projects	Up to 100 per cent grant funding
Most important evaluation criteria for project proposals	<ul style="list-style-type: none"> • Impact on industry sector and companies • SME focus or SME participation in activities • Knowledge and/or technology transfer • Budget • Structure and members of consortium • Potential for innovation

Name of the program	Operational Program Development of Eastern Poland 2007-2013, Priority 1.4 “Promotion and cooperation” with Measure 1.4 “Cooperation – cluster creation and development”
Term of the program	2009-2015
Budget	EUR 11 million
Type of funding	Grant funding
Does the program have a specific technology focus?	No
Are there calls for proposals?	Once a year
Is there a dialogue with applicants about the improvement of their applica-	No

tion prior to the final submission of the application?	
Maximum funding period for a project	There is no maximum funding period.
Is there a maximum amount of funding an applicant can apply for?	There is no maximum amount.
Financing structure of projects	Up to 75 per cent grant funding
Most important evaluation criteria for project proposals	<ul style="list-style-type: none"> • SME focus or SME participation in activities • Knowledge and/or technology transfer • Structure and members of consortium

2.7.1.3 Context of the programs

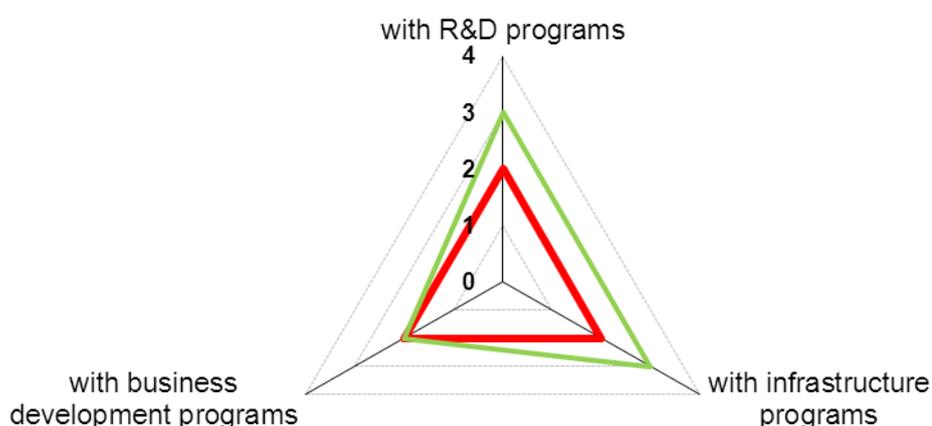
The Polish cluster programs are rather an instrument for economic development in Poland, than instruments for the facilitation of R&D activities as their relevance in the overall policy setting indicates. However, this should not imply that R&D activities do not matter in the context of economic development strategies.

How important is the cluster program in relation to...	0	1	2	3	4
...the overall economic/industrial development strategy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
...other R&D/innovation programs?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>

0 = not important at all ⇒ 4 = very important

Table 34: Relevance of Polish cluster programs in the overall policy setting

The coordination of the Polish cluster programs with other funding programs can be described as good which is not surprising giving the importance that the government attaches to clusters as tools for economic development.



Red line: Innovative Economy Operational Program, Measure 5.1 “Support of the Development of supra-regional clusters”
 Green line: Operational Program Development of Eastern Poland 2007-2013, Priority 1.4 “Promotion and cooperation” with Measure 1.4 “Cooperation – cluster creation and development”

0 = coordination is poor ⇒ 4 = coordination is excellent

Figure 46: Coordination of Polish cluster programs with other national programs

2.8 France

2.8.1 Grappe d'entreprises

Name of program	Grappe d'entreprises
Country	France
Contact details	DATAR – Délégation interministérielle à l'Aménagement du territoire et à l'Attractivité Régionale Constance Arnaud Cluster Policy Manager Tel. +33 1 40 65 10 87 Email: constance.arnaud@datar.gouv.fr
Internet	http://territoires.gouv.fr/grappes-dentreprises

2.8.1.1 Objectives and Rationale of the Program

The program Grappe d'entreprises pursues the overall objective of developing business clusters in economic sectors with weak R&D activity. These sectors are either not covered by clusters of the Pôles de compétitivité program⁷⁴ or do not have the critical mass to be a Pôles de compétitivité.

In order to increase efficiency and effectiveness of support clusters from both programs, Grappe d'entreprises and Pôles de compétitivité, are expected to collaborate. Grappe d'entreprises clusters will benefit from cooperation in terms of R&D, while Pôles de compétitivité clusters can benefit in terms of additional opportunities to commercialize R&D results.

The terms business cluster has to be understood as a generic term for a particular category of clusters. Business clusters targeted by the program can be defined as follows:

- They mainly consist of micro-enterprises/SMEs that are active in the same sphere of activity; where relevant, they integrate large businesses; they work with or integrate training, job and skills management, innovation and research organizations, according to their particular contexts and initiatives;
- They have a "hard core" anchored within one territory which facilitates easy and close relationships between their members and which is relevant to the business network concerned;
- They provide services to businesses which can handle all of their needs through pooling or collective actions, particularly in relation to innovation in all of its forms⁷⁵, jobs and skills, work organization, international development, communication, environmental aspects;
- They have a specific governance structure, in which the entrepreneurs play a driving role, with a collectively developed strategy implemented through a concerted action plan;

⁷⁴ Pôles de compétitivité refers to clusters that are funded within the government program of the same name. For further details about the pôles de compétitivité program see <http://competitivite.gouv.fr/>.

⁷⁵ Technological, organizational (corporate structure, work organization, knowledge management, relationships with external partners, etc.) marketing, service, social, territorial, etc.

- All businesses are included (production businesses, liberal professions, service providers, craft-based manufacturing, etc.), in all activities (commercial, industrial, crafts, tourism, artistic, agricultural, service, etc.) and in all the territories (urban, peri-urban, rural), both metropolitan and overseas;
- They forge links and cooperate with public and private actors from within their territorial ecosystem.

The selection of the beneficiaries was carried out in two stages. Following a first call for proposals 42 out of 112 applications were selected for support. They share the following characteristics:

- Over 30 per cent of these business clusters are positioned in future activity sectors related to the e-economy, the green economy, cultural and creative industries or the services industry. The other sectors that currently form the basis of the French economy, like the food-processing industry, mechanics, construction, health and pharmacy, represent about 60 per cent of the selected applications.
- The business clusters selected are exemplary in the quality of their interactions with other actors in their region, the services they provide to their member businesses, their market objectives and proposed strategy and finally the efficiency of their governance structures.
- Over half of the business clusters selected has already developed partnerships with competitiveness clusters.

2.8.1.2 Target Group of the Program

Target group of the program are groups of companies, research and innovation actors, training institutions and other actors that want to collaborate in a business cluster. The governance structure of the cluster must be independent from public authorities and professional/consular organizations and chaired by an entrepreneur. Clusters that already receive support from the Pôles de compétitivité program are not eligible.

2.8.1.3 Term of the Program, Financial Aspects and Application Procedure

Term of the program	2009, no date of termination
Budget	EUR 24 million
Type of funding	Grant funding
Does the program have a specific technology focus?	No
Are there calls for proposals?	There were calls for proposals at the beginning of the program.
Is there a dialogue with applicants about the improvement of their application prior to the final submission of the application?	Yes

Maximum funding period for a project	36 months
Is there a maximum amount of funding an applicant can apply for?	EUR 500,000
Financing structure of projects	<ul style="list-style-type: none"> Up to 25 % grant funding from the program
Most important evaluation criteria for project proposals	<ul style="list-style-type: none"> Impact on industry sector and companies

2.8.1.4 Instruments

The program awards grant funding for tangible and intangible investments, staff and general operating costs with regard to coordination and management activities of the cluster and collaborative projects carried out by cluster members. Projects have to be indicated in the action plan of the project proposals.

2.8.1.5 Results and Impact of the Program

The program is very young (it started in 2009), so that results and impacts cannot be measured until now.

2.8.1.6 Monitoring and evaluation system

The program management agency is currently working on an indicator system to measure the performance of the program.

2.8.1.7 Context of the program

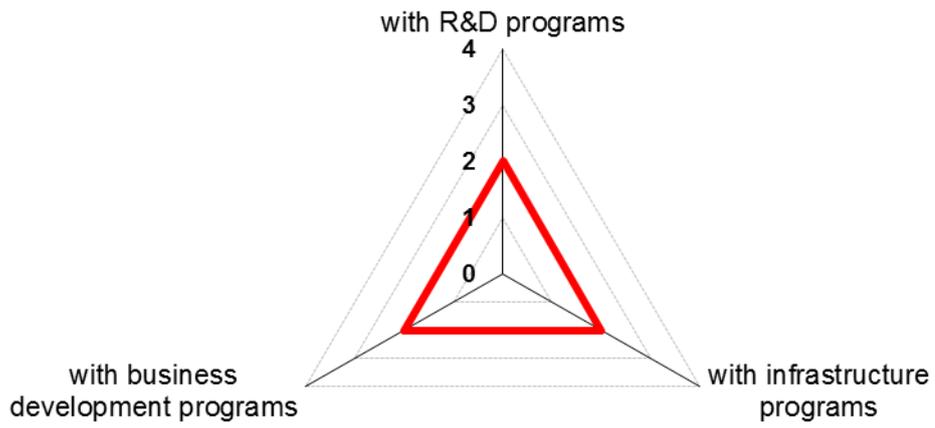
According to program officials the program is a very important program in the overall national policy context as it complements the Pôles de compétitivité program in terms of supporting in particular SME.

How important is the cluster program in relation to...	0	1	2	3	4
...the overall economic/industrial development strategy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
...other R&D/innovation programs?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>

0 = not important at all ⇒ 4 = very important

Table 35: Relevance of the Grappe d'entreprises program in the overall policy setting

Notwithstanding the high relevance of the program in the overall national policy context, the coordination of the program is rather average, according to program officials.



0 = coordination is weak \Rightarrow 4 = coordination is strong

Figure 47: Coordination of the Grappe d'entreprises program with other funding programs

2.9 Greece

2.9.1 Corallia – Hellenic Technology Clusters Initiative Program: Aid Measure for Microelectronics and Embedded Systems)

Name of program	Corallia – Hellenic Technology Clusters Initiative Program: Aid Measure for Microelectronics and Embedded Systems
Country	Greece
Contact details	Corallia – Hellenic Technology Clusters Initiative Nikos Vogiatzis, PhD Clusters Initiative Director of Technology and Cluster Operations Sorou 12 GR-15125 Maroussi, Athens Tel. +30 210 63 00 770 Fax +30 210 61 98 818 Email: n.vogiatzis@corallia.org
Internet	www.corallia.org

2.9.1.1 Objectives and Rationale of the Program

The program is implemented by the Corallia – Hellenic Technology Clusters Initiative under the auspices of the Hellenic Ministry of Development. The mission of the Corallia Clusters Initiative is to develop and establish innovation clusters in sectors where Greece can attain in the near future a worldwide competitive advantage. In this context Corallia is a hybrid form of a program owner and a cluster management organization.

The program “Aid Measure for Microelectronics and Embedded Systems” targets at the development of the semiconductor-nano/microelectronics-embedded Systems sector in Greece, by utilizing and supporting a clustering framework to achieve growth and sustainable development. In particular, the program is structured along four action lines, including three vertical interventions, namely (1) “seed-financing” type of grants to aid the creation of new innovative enterprises, (2) implementation of state-of-the-art R&D cooperative projects, and (3) VC investment-backed R&D, complemented by a (4) fourth horizontal action line consisting of a set of all-round business development and innovation-support aid measures. The entire set of co-financing measures in the program is provided under a clustering framework that aspires to achieve co-operation among highly competitive companies, economies-of-scale and economies-of-scope, as well as transfer of know-how among cluster members that lead to development of new products and better adaptation to new technologies.

2.9.1.2 Target Group of the Program

Organizations eligible to participate and receive co-financing in the form of grants by the program include Enterprises of all types and sizes (micro, small, medium, and large) as well as Academic and Research organizations.

2.9.1.3 Term of the Program, Financial Aspects and Application Procedure

Term of the program	2008-2013
Budget	EUR 33 million
Type of funding	Grant funding
Does the program have a specific technology focus?	Yes
Are there calls for proposals?	Yes
Is there a dialogue with applicants about the improvement of their application prior to the final submission of the application?	Yes
Maximum funding period for a project	There is no maximum funding period.
Is there a maximum amount of funding an applicant can apply for?	There is no maximum amount.
Financing structure of projects	Max. 75 % funding from the program
Most important evaluation criteria for project proposals	<ul style="list-style-type: none"> • Impact on industry sector and companies • Technology or scientific area of the cluster • RTD excellence

2.9.1.4 Instruments

The program provides grant funding for knowledge dissemination, collaborative R&D projects between companies, research institutions and universities, tangible investments to enhance the R&D capability, internationalization activities, training and education, support of start-up companies and advice on intellectual property rights.

2.9.1.5 Results and Impact of the Program

There are no evaluation-based results available yet. Since the inception of the program 40 SME, three Non-SME, 12 universities, one R&D institutions, one training and education provider and seven consultants have benefited from the program that is coordinated by the Corallia Hellenic Clusters Initiative (figures as of 2009).

Figure 48 displays the results of the program according to a self-assessment of the program officials.

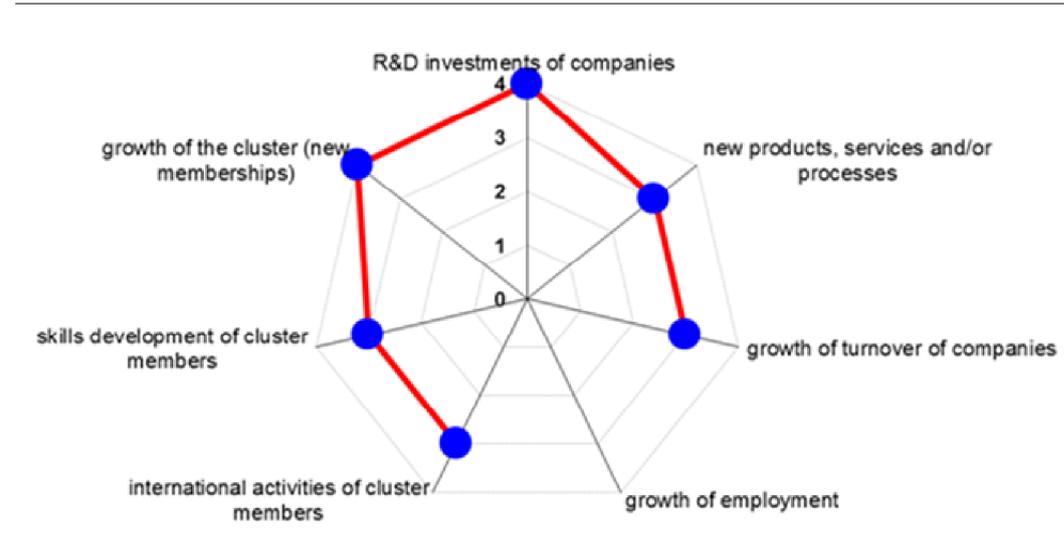


Figure 48: Results of the program

2.9.1.6 Monitoring and evaluation system

The program will be twice during its term (approximately every 24 months).

The following indicators are used to monitor the performance of the program:

Indicators	
Output	<ul style="list-style-type: none"> • Number of patents • Number of trainings • Number of joint collaborative projects • Number of PhD theses • Number of new SMEs established
Results	<ul style="list-style-type: none"> • Percentage of revenue increase • Percentage of export increase • Percentage of employment increase • Percentage of FDI increase • Percentage of quality standards applied
Impact	<ul style="list-style-type: none"> • Internationalization • Cluster expansion • Social impact • Cluster spill-overs

Beneficiaries are monitored by written reports, by regular independent evaluations and by regular independent benchmarking exercises.

2.9.1.7 Context of the program

The program is important in the overall policy context due to its relevance for regional economic development (Table 36). In the Greek context the program has established a reference case for two reasons: It was the first bottom-up driven program in Greece as relevant stakeholders were involved from the very beginning and extensive consultations took place. It also represents a shift in terms of policy thinking as it focuses on economic areas where Greece has a competitive advantage, while prior to this program tended to finance “a little bit of everything” which resulted in less effectiveness and efficiency.

How important is the cluster program in relation to...	0	1	2	3	4
...the overall economic/industrial development strategy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
...other R&D/innovation programs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>

0 = not important at all ⇒ 4 = very important

Table 36: Relevance of the Corallia program in the overall policy setting