Strengthening Clusters and Competitiveness in Europe

The Role of Cluster Organisations

Dr Christian Ketels
Dr Göran Lindqvist
Dr Örjan Sölvell

STOCKHOLM SCHOOL OF ECONOMICS

CENTER FOR STRATEGY AND COMPETITIVENESS

Executive summary

During the last decades EU has shifted political focus to innovation, the knowledge economy and sustainable competitiveness. Cluster based strategies have become central place in industry policy, but also in connection with regional and science policy at the EU level. At an early stage DG Enterprise and Industry decided to introduce cluster mapping tools and analysis to support this new policy direction. The first maps launched in 2005 covered only part of Europe, but by 2007 the mapping tool covered all regions of Europe.

The European Cluster Observatory has now been in existence for more than five years. It is used widely by policymakers, practitioners and researchers. By 2012 over 2,000 maps were produced every month and over 1,500 documents downloaded every month from the Cluster Library. The Observatory is widely quoted in media, in policy papers and in scholarly work.

A search on Google on **"Cluster Policy"** (October 2012) produces over 50,000 hits. The number one hit is the PRO INNO Europe Paper No 9 - *The Concept of Clusters and Cluster Policies and their Role for Competitiveness and Innovation: Main Statistical Results and Lessions Learned*. This paper, a staff working document launched in 2008, pushed for a fact-based approach to cluster policy, and the report was based on data and analysis from the European Cluster Observatory.

The Observatory offers free on-demand data and analysis on more than 600 industries, over 400 regions, and thousands of cluster and other organisations involved in clusters. Some 3 million raw data points are translated into 1.3 million indicators accessible on the web platform. In 2012 The U.S. Department of Commerce in collaboration with Harvard Business School decided to launch a U.S. web-based mapping tool, similar to the European Cluster Observatory, including both clusters and cluster organisations.

Many hundred cluster organisations throughout Europe use the European Cluster Collaboration Platform, set up as an auxiliary service to the Observatory in 2010.

A new survey of cluster organisations in Europe reveals that cluster organisations put their focus on building an identity, a strategy and brand for the cluster, and enhancing innovation through collaboration across innovation gaps and joint R&D projects. Less focus is put on business development among member firms (export promotion, commercial cooperation and joint purchasing). Thus, clusters have carved out a position as important vehicles within the innovation agenda for Europe.

Cluster organisations are truly public-private partnerships. On average they follow a 60/40 rule with 60% public financing. This holds both for older and more recently established cluster organisations, and across most countries in Europe.

The experience of the cluster manager, measured as the number of years working with cluster initiatives, is significantly related to internal performance, and also to performance in terms of improved competitiveness.

Cluster initiatives with large staffs perform better in every aspect, both internally and externally. Among European cluster organisations there is no significant difference in performance between the clusters that were initiated through a public call or policy program, and those that were initiated by a private sector initiative. Nor does there seem to be any strong effect from whether the cluster initiative is organised as a legal entity or not.

Having formal membership is strongly associated with financial sustainability and improved collaboration among firms.

The strength of the underlying cluster is critical for the performance of cluster organisations.

Cluster managers in Europe are most frequently in touch with firms in the cluster, helping to close the firm-to-firm gap. More than 80% are in touch with firms at least every week. Cluster managers interact the least frequently with financial institutions, and outreach to other clusters and international markets are also relatively less frequent.

Cluster managers report the best impact on improved collaboration among firms in the cluster (firm-to-firm gap). 89% report improvements over the last three years in collaboration among firms. Similar results are reported for collaboration firms-to-research institutions, and for collaboration with other clusters.

The higher priority a cluster organisation puts on collaboration among firms, the better is performance in every aspect, both internally and externally.

The European Cluster Observatory has made an important contribution to the fact-driven policy debate about the role of clusters in the European economy. At the level of the European Commission, it has informed a succession of reports, written by high level policy groups, as well as Commission communications on clusters and cluster policy.

Cluster based strategies – as part of industry, innovation, regional and science policy – should account for both a rejuvenation of established industries in Europe, as well as paving the ground for new emerging industries. The chances of success are improved if such policy initiatives are fact-based.

Table of Contents

Figures and tables

Acknowledgements

Chapter 1

The European Cluster Observatory

In the spring of 2012 The Economist ran a feature article on the state of the German economy (The Economist, 14 April 2012). Part of the analysis looked into the strengths of German business and also the historical role of regions. A point was made that Germany today is the home to many competitive clusters, and here the European Cluster Observatory was quoted as the source:

"Before Bismarck, Germany's provinces, principalities and palatinates often had rulers who were keen to establish local industries. In 1678 Brandenburg's Great Elector gave Bielefeld the privilege of certifying the quality of local linen, cementing its position as a centre for the textile trade. Centuries later Beckhoff's first customers made machines for the furniture industry that had developed out of the crate-making trade that had grown with the export of textiles. Dozens of other regions can tell similar stories, and these concentrations have become part of the country's contemporary success. On a list of 100 clusters picked by the European Cluster Observatory for their size, level of specialisation and location in innovative regions, Germany occupies 30 places."

And here follows a quote from a Cabinet member in Bulgaria:

"The Cluster Observatory was instrumental in preparing key input for Bulgaria's new Economic Development Strategy. With the aid of the Observatory, the Center for Economic Strategy and Competitiveness in Sofia were able to make an overall assessment of Bulgarian companies, structure them into cluster and thus produce the first cluster map of Bulgaria. With the Observatory's model, it was for the first time possible to assess which of the clusters of Bulgaria were internationally competitive with significant export potential. Before this work, such a survey had not been available".

These two citations show that the European Cluster Observatory now has occupied a central place as a reference for clusters and competitiveness. And not only clusters; the Observatory is now also used as a reference for many other areas of economic policy; measuring regional framework conditions, cluster initiatives, transnational cluster networks and other economic points of reference across Europe. The Observatory is used by public officials, researchers, practitioners, cluster organisations and many other users, and has inspired policy debate in Europe in areas of industry, innovation, regional and cluster policy. Today, the Observatory has around 2,000 registered users, and every month more than 2,000 maps are produced and 1,500 books and reports downloaded.

Figure 1. Policy documents and debate inspired by the European Cluster Observatory

Over the last decade or more we have sadly witnessed how EU strategies and visions have not been fulfilled. Without good and reliable data, at both the macro and the micro levels, Europe has suffered from a lack of accountability. Through the work with the European Cluster Observatory a data has been collected from over 30 nation states, including over 400 regions, over many years, and compiled into easily accessible maps, tables and graphs on the website. The use is free of charge and many thousand users download material every month.

In Europe we should not accept policies and programmes built on thin air and wishful thinking. The Observatory with its rich data on clusters, cluster organisations and regional framework conditions has opened up for fact-based policies, in areas related to industry, regions, innovation and clusters. In addition, a separate Cluster Collaboration Platform (www.clustercollaboration.eu) offers a range of new tools to cluster managers throughout Europe. We see evidence that many cluster organisations make an impact on their clusters, enhancing innovation, growth and competitiveness. Thus, support of cluster policies and programmes at the EU level has led to concrete results. Now, there is a twice as large likelihood that a ranked cluster (one – three stars according to the Observatory) has a cluster organisation than a non-ranked cluster (12% as opposed to 5% with a cluster organisation). This is well in line with research results from the Observatory showing that the strength of a cluster programme is dependent on the underlying cluster.

There is compelling evidence (see Europe INNOVA/PRO INNO Europe papers No. 5 and 9) of a close alignment between innovation, competitiveness, regional framework conditions and clusters,

due to powerful externalities and spill-overs across firms. Data for regional framework conditions, analysed by Orkestra in San Sebastian, Spain, shows that there is a positive relationship between Regional GDP per capita and 1) employment in strong clusters (clusters highly over-represented in the region), and 2) the regional mix of clusters (measures how much regions benefit from the cluster mix effect rather than strong performance within any individual cluster). If we compare the regions of Europe according to key economic indicators, we receive nine groups, see Figure below (marked with yellow, orange, light green, olive green, turquoise, dark blue, light blue, dark pink, light pink). The indicators include:

- **Size, demographic and location indicators**: population, population density. ageing rate and multimodal accessibility index.
- The economy´s **industry structure**: the distribution of employment among the ten major sectors of Eurostat's regional economic accounts
- **Industrial specialisation**: the distribution of industrial employment in eleven large sectors inspired by the OECD's STAN database classification
- **Technological specialisation**: percentage distribution of EPO patents among the 8 sections of the international patent classification (IPC).

Figure 2. Peer regions in Europe
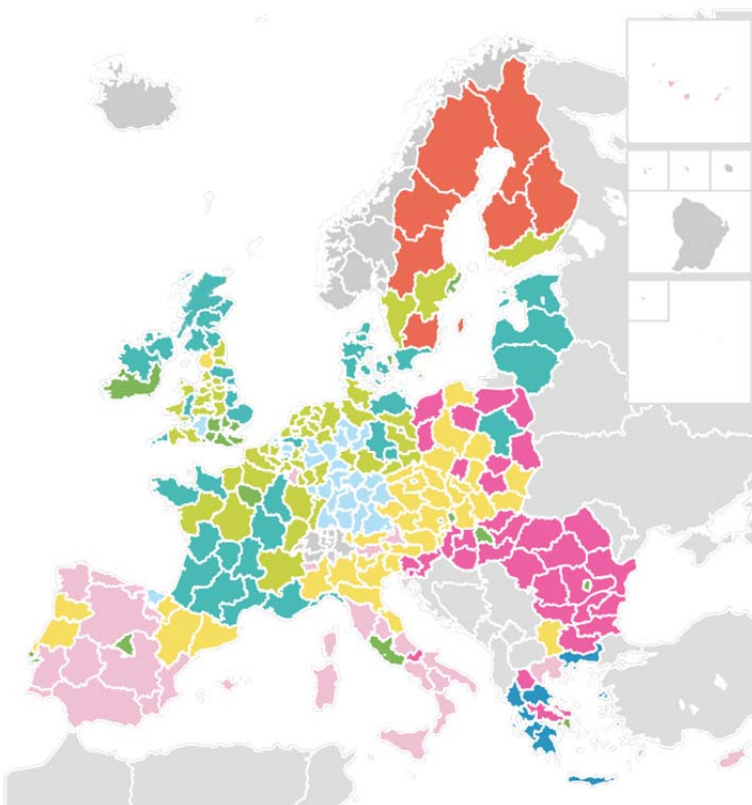
Europe has many world-class clusters (for a list of the top-100 clusters see http://www.clusterobservatory.eu/common/galleries/downloads/Strong_Clusters_in_Innovative _Regions_Report.pdf). It is commonly understood that clusters constitute open environments with companies, public organisations, research organisations, education organisations and capital providers that compete and cooperate in various ways. Dynamic clusters tend to have strong social fabric and dense local networks where new ideas emerge, are tested and brought to use and commercial value. Thus clusters constitute the breeding ground for innovation. The seeds of

innovation sometimes emanate from within clusters, but it is not uncommon that they turn up almost anywhere and anytime. But again, the process of turning new entrepreneurial ideas, consumer input on improvements and research, into commercial products and business models, mainly takes place in dynamic clusters.

Europe needs to reinvigorate traditional clusters, but also needs new emerging industries and clusters. New industries emerge in localities where there is a diversity of enabling and application industries. Below we show a classical example from the Gothenburg region in Sweden. An old sugar works in the mid-18th century was turned into textile industry (mid-19th century), which led to the development of an innovative component industry (to solve mechanical problems in the workshops), which in turn led to the development of an automotive industry in the early 1920s, which in turn constituted the soil for a vehicle safety industry, and furthermore telematics and visualisation services in the 21st century. Some of the lead firms in this chain include Gamlestaden (textile), SKF (ball and roller bearings), Volvo (cars and trucks) and Autoliv (automotive safety equipment). A mix of regional framework conditions and cluster dynamics led the evolution into new attractive industries, through buyer-supplier linkages and technological spill-overs.

Figure 3. Emergence of new sectors in the Gothenburg region over 150 years
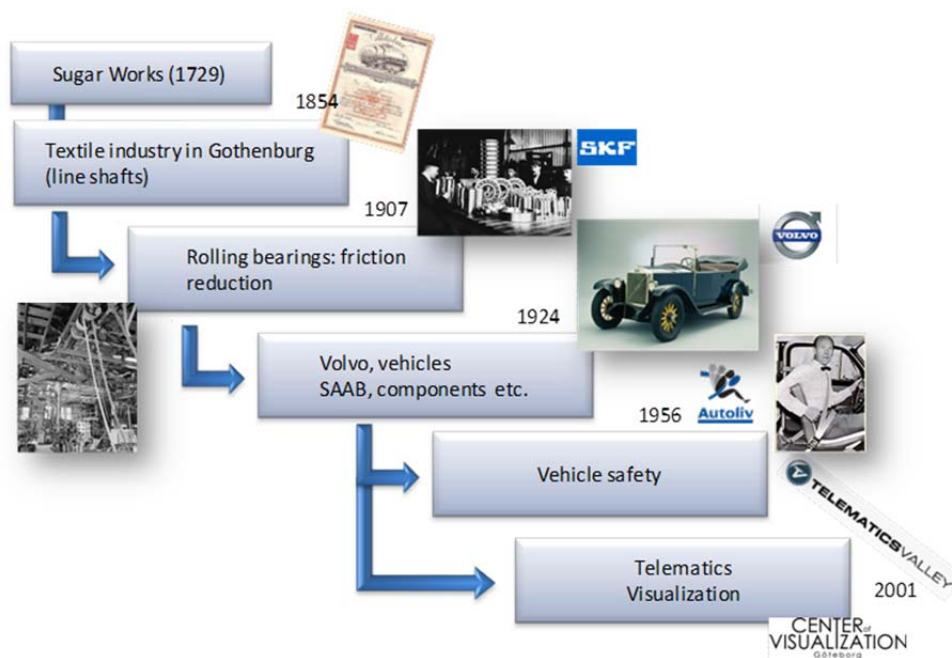
The History of Cluster Mapping

The methodology behind cluster mapping goes back to the model developed by Professor Michael Porter. The mapping consisted of two fundamental parts:

- the development of cluster codes which can identify and measure industrial agglomerations within regions;
- the development of performance measures which can measure the competitiveness and dynamism of clusters.

For the first task, co-location patterns of industries across the U.S. were calculated. Such industry agglomerations reflect "revealed" patterns of externalities. If two or more industries tend to co-locate

it is a signal that these industries have common interests or linkages, such as the sharing of labour skills, technological co-operation and the like. A set of 41 so-called traded cluster codes were decided on, accounting for roughly one third of total U.S. employment. Cluster performance was measured by collecting both statistical materials (growth over time, wage data, etc.) and survey data based on managers' views.

Figure 4. History of cluster mapping
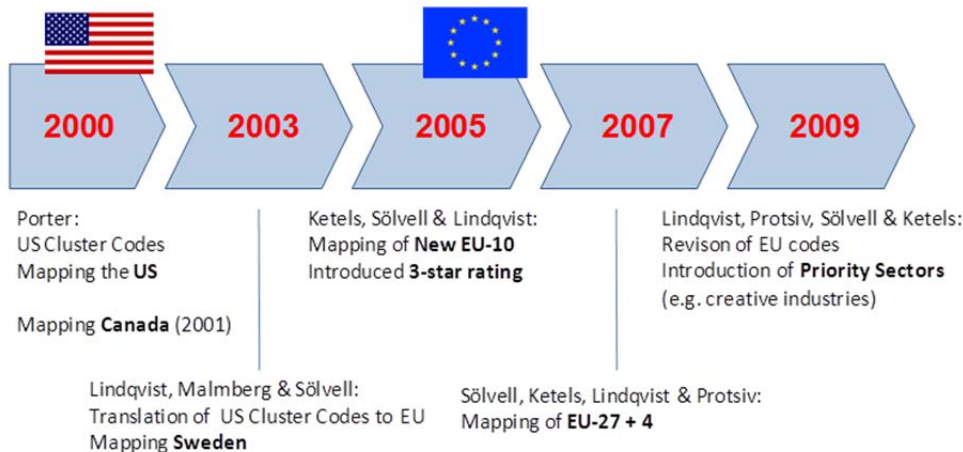
In 2003, the U.S. model was brought to Europe by Professor Örjan Sölvell, Dr. Christian Ketels, and Mr. Göran Lindqvist. A first mapping exercise was done for Sweden. In 2004, Ivory Tower in Stockholm was asked as a subcontractor (Europe INNOVA, under FP6) to map all clusters of the accession countries (EU-10). The project was led by a panel group of experts, including Mr. Antoni Subira of Spain. The EU-10 cluster mapping data were published in the first Europe INNOVA paper. The EU-10 project added a new innovation to cluster mapping: the measurement of concentration and specialisation by the use of three distinct indexes – cluster size, specialisation and regional labour market focus. A few clusters scored on all three measures and those clusters were designated as "three star clusters". The star methodology was a sound way of describing degree of cluster agglomeration, and was easily understood by non-experts in the field.

In 2006, a cluster mapping contract was awarded by DG Enterprise and Industry to a consortium coordinated by Professor Sölvell at the Center for Strategy and Competitiveness at the Stockholm School of Economics. It covered all of EU-27 plus Iceland, Norway, Switzerland, Turkey and Israel. The cluster mapping part of the project was renamed "The European Cluster Observatory" and the website was launched in July 2007.

The European Cluster Observatory Website

The European Cluster Observatory website provides a single access point to clusters, and today the Observatory covers: clusters based on 56 sectors in 404 regions in 36 countries, regional statistics including 39 indicators offered for 264 regions in EU-27, over 1,400 cluster organisations and over 1,600 other organisations playing critical roles within clusters. Furthermore, the Observatory offers data and analysis of regional competitiveness conditions and transnational cluster networks in Europe. The Observatory also offers a cluster library and a classroom for cluster and cluster management education.

In 2009/2010 new cluster codes were adopted for Europe, and a number of new features were added to the website, most notably:

- Cluster mapping data with time series (with flexible definition of sectors and regions)
- New sectors added (creative and cultural industries, knowledge-intensive business services, life-science)
- Eleven new transnational regions added
- Data for organisations involved in networking, innovation and research, also involving new sectors including Creative and Cultural Industries, Green technology, Micro and Nanotechnology, and Optics and Photonics, each with several subindustries
- Economic and social indicators for regional framework conditions
- Cluster Observatory Scoreboard with rankings and data on Smart Specialisation
- Cross-references between sectors – regions – documents in library – organizations – networks – events
- A cluster collaboration platform – an easy-to-use platform that enables cluster organisations and their members to collaborate in activities that create new business activity
- Regional microeconomic framework conditions (infrastructure, human skills, R&D, innovation, entrepreneurship, etc.).

The Observatory is a platform used throughout the world. The number of visits (Sep 2011-Aug 2012) reached 42,449 (unique visitors: 23,172) with an average time on site of around 14 minutes. Furthermore, the Observatory has been presented by membrer staff at well over 100 events with a total of about 10,000 participants. The Observatory has 647 followers on Twitter. Web pages mentioning "European Cluster Observatory" according to Google is at around 51,600, and 142 web pages link to the Observatory. 330 academic sources mention the "European/Europe Cluster Observatory" according to Google Scholar.

In 2012 a similar web platform was launched in the U.S. (U.S. Cluster Mapping), partly building on the European design. A global portal (http://www.clusterobservatory.org/) was also launched in the spring of 2012 by the Center for Strategy and Competitiveness in Stockholm.

Figure 5. History of the cluster observatory
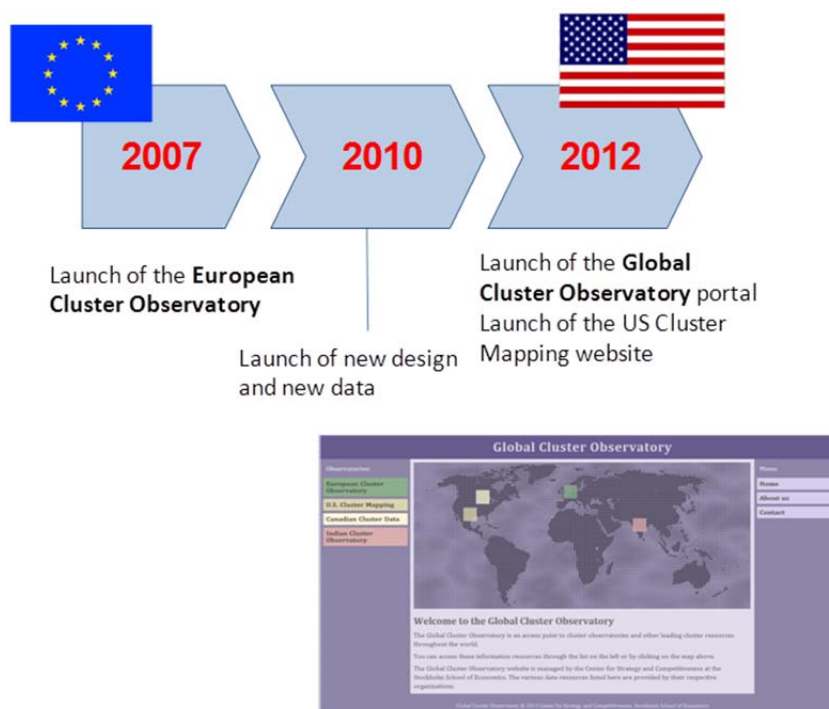
The Cluster Observatory Evaluation Model

As cluster policies and programmes have become part of the political toolbox, we have witnessed an increasing interest in evaluating the effectiveness of such policies and programmes. In 2008 Francoise Le Bail, Deputy Director-General for DG Enterprise and Industry wrote *"Measuring the impact of cluster support programmes against generally agreed performance indicators remains a challenge"* (Europe INNOVA/PRO INNO Europe paper No. 9). This challenge we have decided to tackle. And we are convinced that such evaluation should be based on real and reliable data, where the Observatory is one important source.

Evaluation of cluster programmes in Europe should be grounded in rules and regulations specifying that implementation of policies and programmes demand the inclusion of long-term strategic plans, medium-term (1-3 years) measurable goals and evaluation to follow up on performance. Good and sound evaluation is important to both legitimize a new policy or programme, and to facilitate learning from the process in order to improve it. In spite of a rapid increase in the number of cluster policies and programmes, and thousands of cluster initiatives around the world, there is still a lack of solid evaluation models. The "Redbook" (Sölvell, 2009), inspired by the work of leading evaluation specialist Professor Evert Vedung, defined cluster programme evaluation as:

> *"Cluster programme evaluation is the careful assessment of the merit, handling, and effects of ongoing or finished public interventions, with the intention to acquire greater knowledge and improve on future actions"*

With all the richness of regional and cluster data now available, the Observatory will offer evaluation services. By developing a model with several components, we can now manage to control both for external explanations (by using carefully selected control groups), and to capture unintended effects through process tracing (mainly through interviews). The fundamental idea of the model is to use a number of complementary data sources and methodologies (Figure 6):

1. Statistical analysis of firm financial performance compared to control groups (the SIMPLER tool includes value added growth, profitability, wage per employee and other data from annual reports)
2. Surveys of social media (text analysis) and surveys of cluster organisations and member firms in clusters (e.g. performance of firms, bridging innovation gaps, cluster identity and level of trust)
3. Interviews with cluster managers and member firms (process tracing)
4. Benchmarking with other clusters/regions and the use of peer evaluation teams.

Figure 6. The cluster observatory evaluation model with four complementary methods
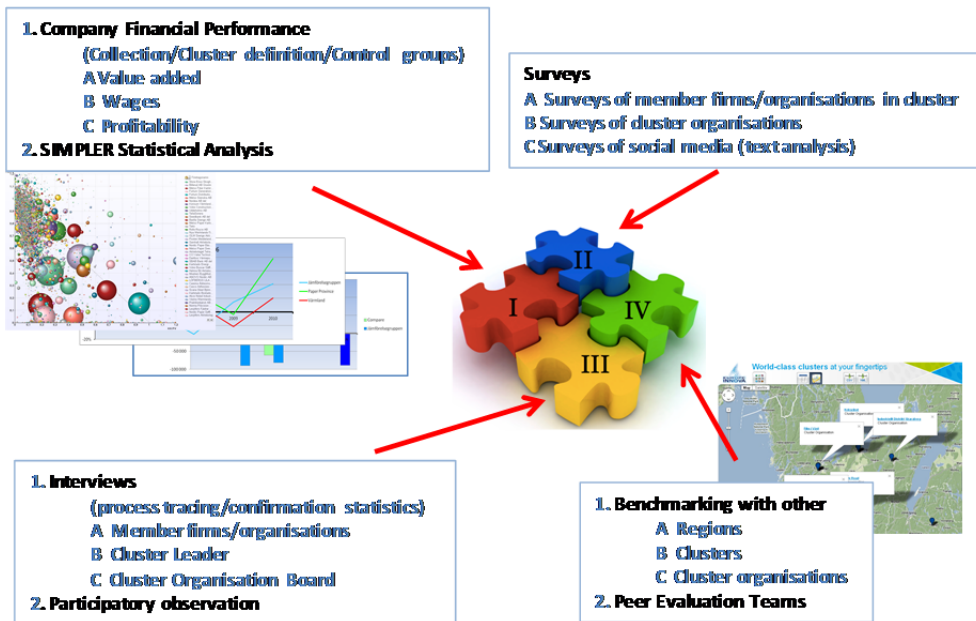
By using complementary methods we can compensate for weaknesses inherent in each method, and also make use of the strengths of each method. The strength of the SIMPLER evaluation, based on official company financial statistics, is that it allows for well defined control groups, which can control for outside explanatory factors (arrow 4 in Figure 7). Also the benchmarking tool allows for control groups. The strength of survey tools is that it measures direct effects from the programme (arrow 1 in Figure 7), and the strength of interviews is that it allows for process tracing, i.e. picking up unintended effects both inside and outside of the target area (arrows 2 and 3 in Figure 7).

Figure 7. Planned and unplanned impact from cluster programmes, and outside explanatory factors
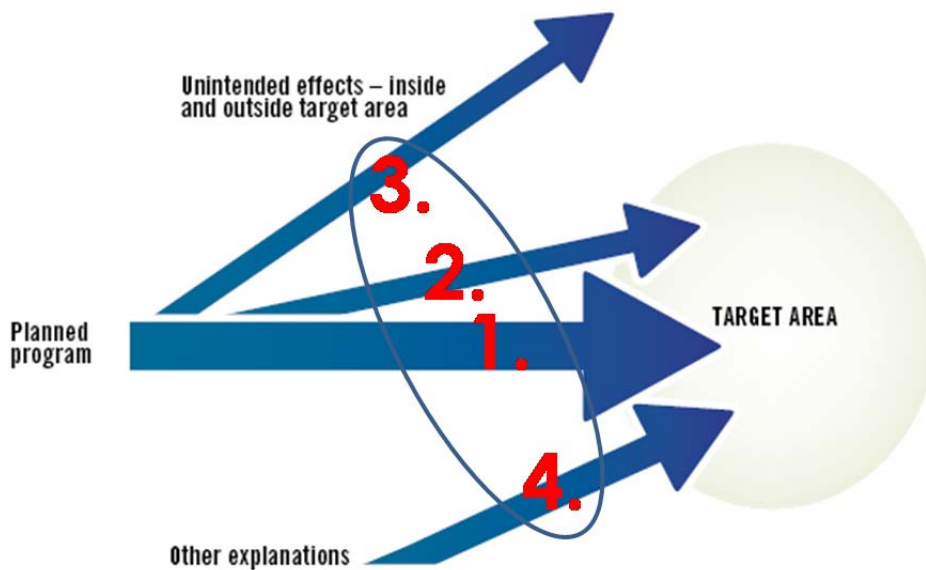
The Cluster Collaboration Platform

In times of a more and more globalized economy and tougher competition there is a need for intense networking and bottom-up cooperation. Keeping this approach in mind the European Cluster Collaboration Platform (ECCP) was developed; the only tailor-made online platform exclusively developed for cluster organisations and their members (especially SMEs), to unleash their full potential. Clusters and their SMEs can be seen as a major backbone of the European economy, and hence supporting them creates the added value for the people in Europe. Right now more than 1.800 clusters have been identified in Europe, out of which more than 800 are registered on ECCP.

Given the fact that European markets are more and more saturated and the booming areas of global economy can be detected mainly in Asia and South America, internationalisation of SMEs is a crucial success factor of the European economy. In the recent empirical study "Internationalization of Networks " altogether 91 networks from 10 European countries were interviewed regarding their internationalisation approaches.

"Although all interviewed networks express the motivation to adjust to an international orientation and engage in transnational cooperation in the future, just 10% of them could specify concrete strategies and plans on how to realize their internationaliation efforts in practice. The majority of the networks interviewed had, if at all, vague ideas by which means the network and its members could adjust to a more international focus (see www.clustercollaboration.eu).

Cluster organisations and SMEs are lacking resources (financial and time) to boost internationalisation. For this purpose, the European Cluster Collaboration Platform is the most cost effective solution solving this bottleneck. Before the ECCP was launched in 2009, a European survey focused on cluster managers and cluster policy maker to identify their needs. 420 cluster actors provided detailed input regarding their expectations from such an online portal. Based on the survey key features were identified and integrated into the development of the platform. The features of ECCP have been continuously further developed. To mention just some of them this platform offers the possibility of:

- Mapping and profiling of cluster organisations,
- Mapping and profiling of cluster members,
- Establishing sectoral and thematic communities,
- Searching for new project ideas and financing source,
- Setting up future collaboration with future partners
- Launching competitions including voting
- Support of cluster and SME internationalization

Mapping and profiling of cluster organisations

The mapping and profiling of cluster organisations is one of the cornerstones of the European Cluster Collaboration Platform. Registered cluster organisations are visible globally for prospective partners and can profile themselves. Thus, it is now much easier for them to be found by prospective partners, and it is free of charge. Top clusters fulfilling the highest quality standards can apply for a gold label assessment. If the gold label is awarded, a global standard is proven regardless of the country the cluster is located.

Figure 8 gives an overview of all registered cluster organisations labelled bronze and gold, awarded by consortium members of the European Cluster Excellence Initiative.

Figure 8. Cluster organisations labelled bronze (green) and gold labels (red)
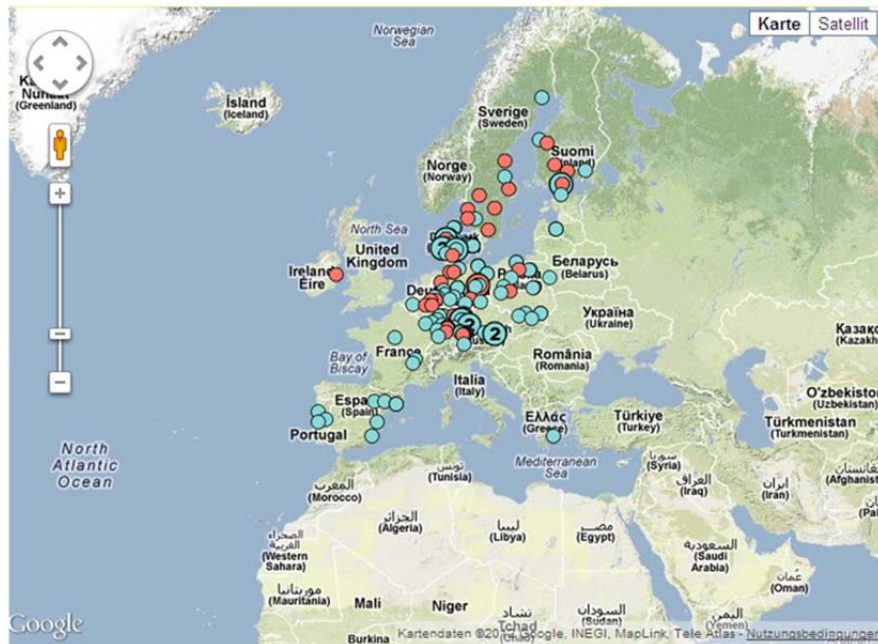
The mapping and profiling of cluster members is the next step which has been taken to boost cooperation between cluster organisations and their SMEs. If a cluster organisation or SME has already identified a suitable partner cluster, it is possible for them to search for cluster members and their services.

Based on the services addressed above one of the key aspects of ECCP is "SME internationalization through clusters". By means of signing Memoranda of Understanding (MoUs) with key markets such as Japan, India, the Republic of Korea, Brazil and Tunisia, ECCP is fostering awareness among policy makers on the issue of global cooperation. Furthermore, this platform offers a wide range of tools to link clusters and their SMEs globally. MoU countries can provide information about their countries including videos; create their own event calendars, providing tailor-made newsgroups, start discussions, search for partners etc. By integrating five international cluster projects funded by DG Enterprise and Industry on ECCP, the attractiveness of this platform could be further improved.

Chapter 2

Cluster Initiatives and Organisations in Europe

The European Cluster Observatory lists some 1,400 cluster organisations. In a survey of cluster initiatives (CI) carried out in 2012 (GCIS), the Observatory collected data from 254 cluster organisations in Europe. The data ranges from basic descriptive statistics (age, size, sector focus, objectives, cluster manager background, financing, board etc), to input on bridging of innovation gaps (Chapter 3) and performance.

Most respondents are from Germany, Spain, Denmark, Sweden and Poland (see Table 1).

Table 1. GCIS 2012 - Country of respondents

Country	Respondents	Country	Respondents
Germany	37	UK	7
Spain	34	Finland	6
Denmark	20	Ireland	5
Sweden	18	Latvia	5
Poland	14	Bulgaria	4
Switzerland	12	Netherlands	4
Hungary	11	Slovenia	4
Belgium	10	Estonia	3
Italy	10	Greece	3
Portugal	10	Lithuania	2
Romania	9	Iceland	1
France	8	Malta	1
Norway	8	Slovakia	1
Austria	7		

General Background

As was the case in the original Cluster Initiative Greenbook from 2003, cluster organisations are most common in sectors such as IT and Automotive. However, sectors including Food processing, Health care, Energy and Green technology, is on the rise, partly reflecting the increased political focus on these industries (see Table 2).

Table 2. Industry sector of the respondents

Sector	No of respondents
IT	41
Food	16
Energy	16
Health	15
Automotive	14
Green Technology	14
Production Technology	11
Maritime	11
Transportation and Logistics	10
Metal Manufacturing	9
Materials	9
Creative Industries	8
Biotech	8
Tourism	7
Medical	6
Optics and Photonics	6
Business Services	6
Agricultural Products	5
Education	5
Forest Products	5
Micro and Nanotechnology	5
Aerospace	5
Chemical	5
Textiles	4
Construction	4
Media and Publishing	4
Entertainment	2
Telecom	2
Furniture	1

Start of the cluster initiative

Almost all cluster organisations in Europe have been formed after the influential book *"The Competitive Advantage of Nations"*, published by Professor Michael Porter in 1990. The data suggests that a peak was reached around 2008 – 2010. Half of the cluster organisations were initiated in 2007 or later (Figure 9).

Figure 9. Initiation year of cluster initiative
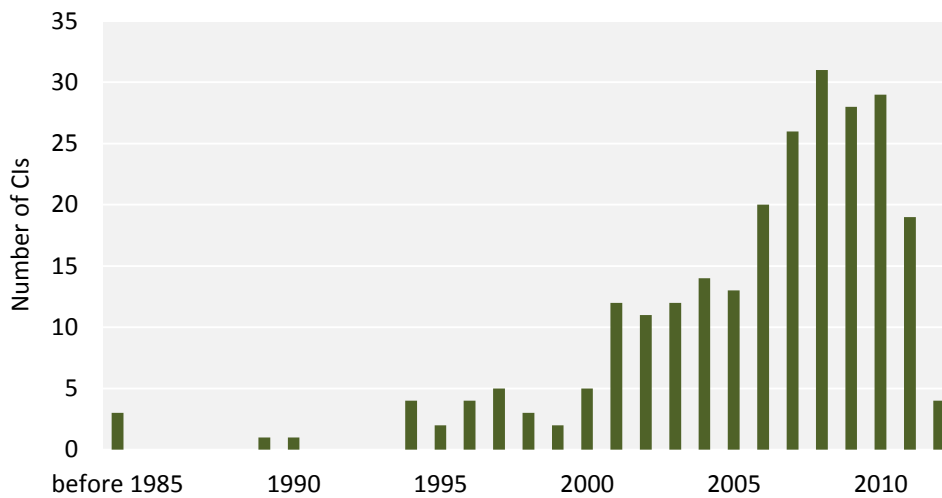
Cluster initiative staff size and website

Cluster initiatives typically are organised through small and nimble organisations. There is often an entrepreneurial spirit driving the organisation, walking across the gaps between actors inside clusters, and receiving financial support from a range of both public and private sources. Half of the organisations have 3 or fewer employees (Figure 10).

Figure 10. Number of employees in the cluster organisation
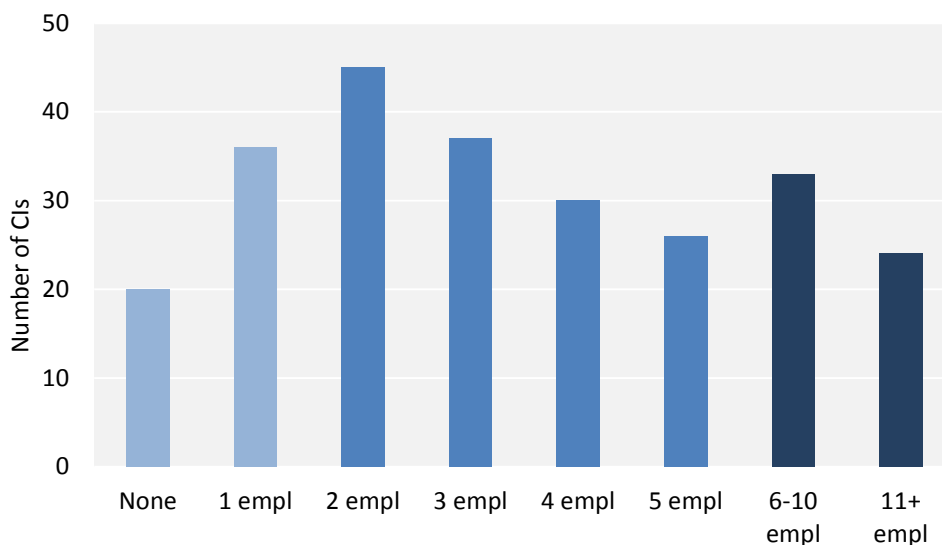
Participating firms

To succeed in bridging innovation gaps cluster organisations can facilitate dense networks and frequent face-to-face contact. Typically more than 50% of member firms are within one-hour driving distance (Figure 11). This is not to say that cluster initiatives are only local. There is also a global dimension to clusters, and many cluster organisations have networks with clusters around Europe and in some cases all around the world (closing the gap to global markets and value chains will be

discussed below), but rarely these are formal members. Regarding membership 75% of clusters have formal members, whereas 25% work in more loosely-coupled partnerships (Figure 12).

Figure 11. Share of cluster firms within one-hour driving distance from office
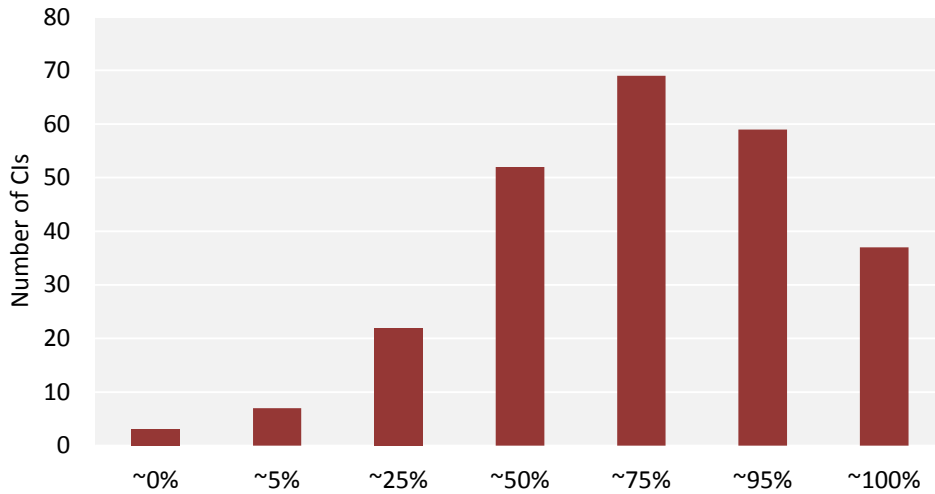
Figure 12. Share of CIs with formal membership
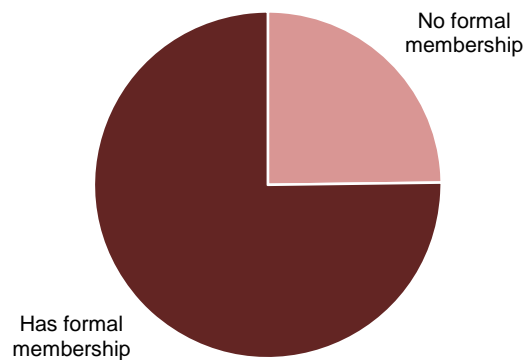
The number of formal members varies. A majority of cluster organisations have from 20 and up to 100 members (Figure 13). Only a few CIs have limitations to formal membership (Figure 14). As well-functioning clusters are open innovation systems, this is well in line with earlier results (Greenbook, 2003). Limitations on firms outside the target region (almost 20%) are in line with the regional focus we expect from CIs.

Figure 13. Number of formal members
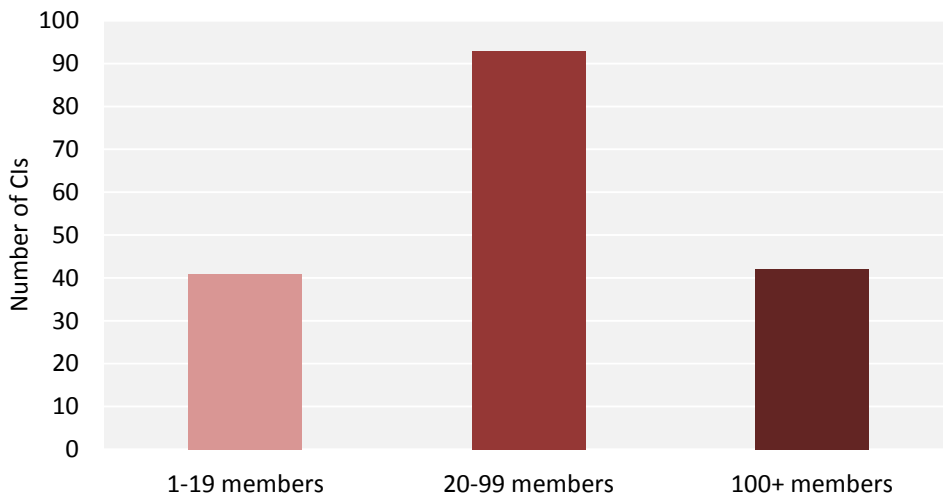
Figure 14. Share of CIs with limitations to formal membership
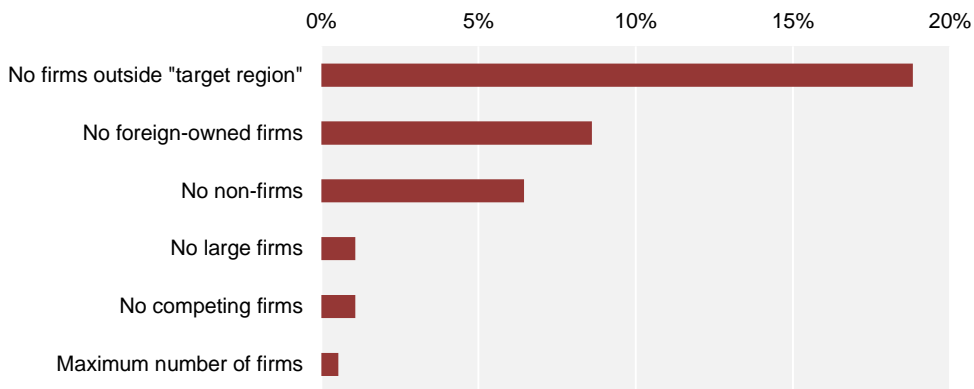
Trigger and funding

Cluster organisations are truly public-private partnerships. This can be seen from Figure 15, where public sector and private sector initiatives are equally common. The public-private partnership status is also underlined by the fact that some 40% of funding, on average (excluding "other", see Figure 16) is private and 60% public. Older CIs tend to have somewhat higher revenues from sales of services (consulting) and somewhat less national public funding (Figure 17).

Figure 15. Original trigger for the initiation of the CI

Public sector
41%

Private sector
40%

Other
19%
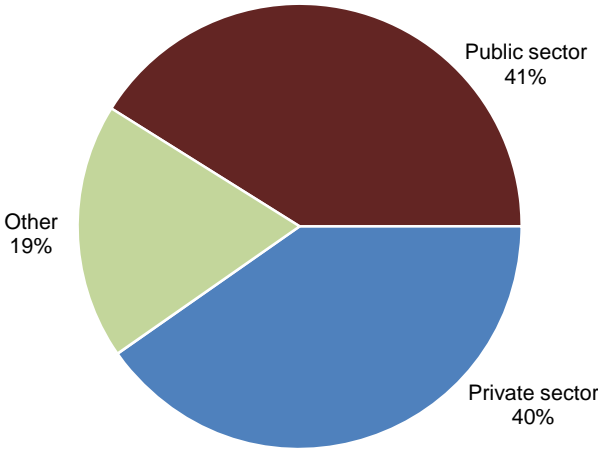
Figure 16. Sources of CI revenues

Other
12%

International public
13%

Membership fees
25%

Sales of services
9%

Regional / local
public
24%

Nat public
17%
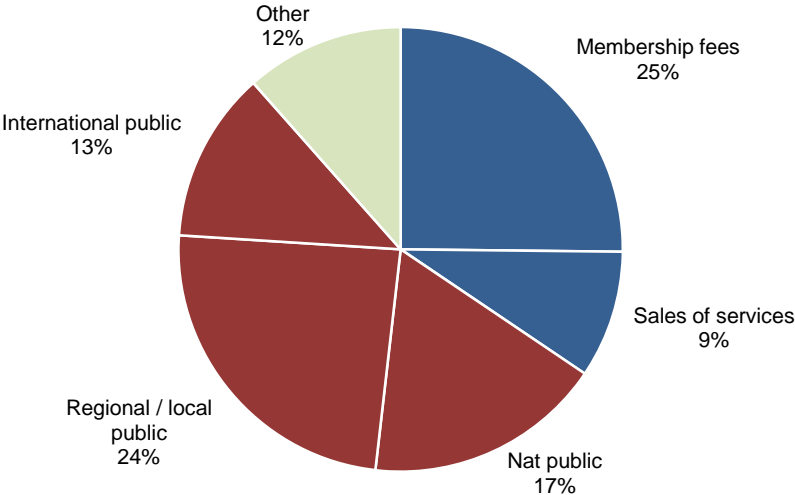
Figure 17. Sources of CI revenues, by age of CI

■ 0-4 yrs ■ 5-9 yrs ■ 10+ yrs

Membership fees · Sales of services · National public · Regional/ local public · International public · Other
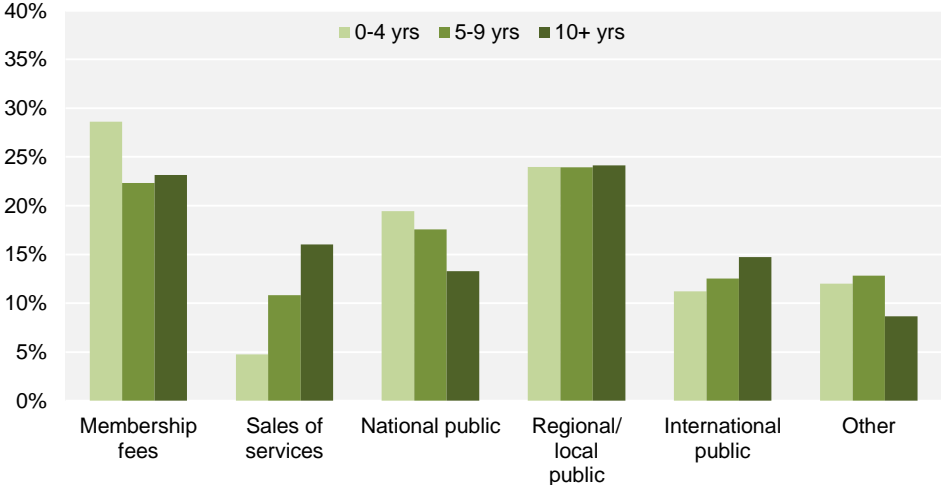
The larger CIs have fewer revenues from membership fees and more income from services (Figure 18).

Figure 18. Sources of CI revenues, by size of CI staff
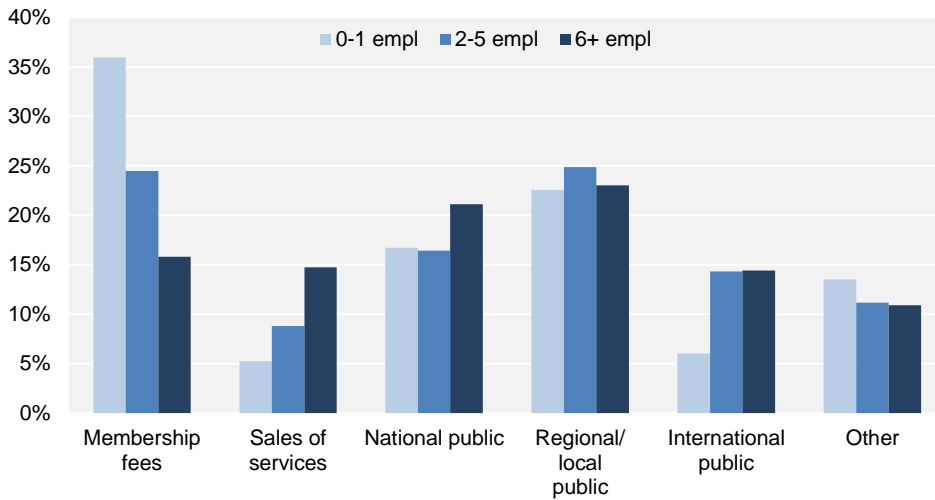
Objectives

Cluster organisations pursue a range of objectives. There most prioritised include building a cluster identity and branding the cluster/region, initiating innovation projects and R&D investment, and building a strategy and vision for the cluster. Business development objectives such as joint purchasing and export promotion attract less attention (Figure 19).

Figure 19. Level of priority for ten objectives
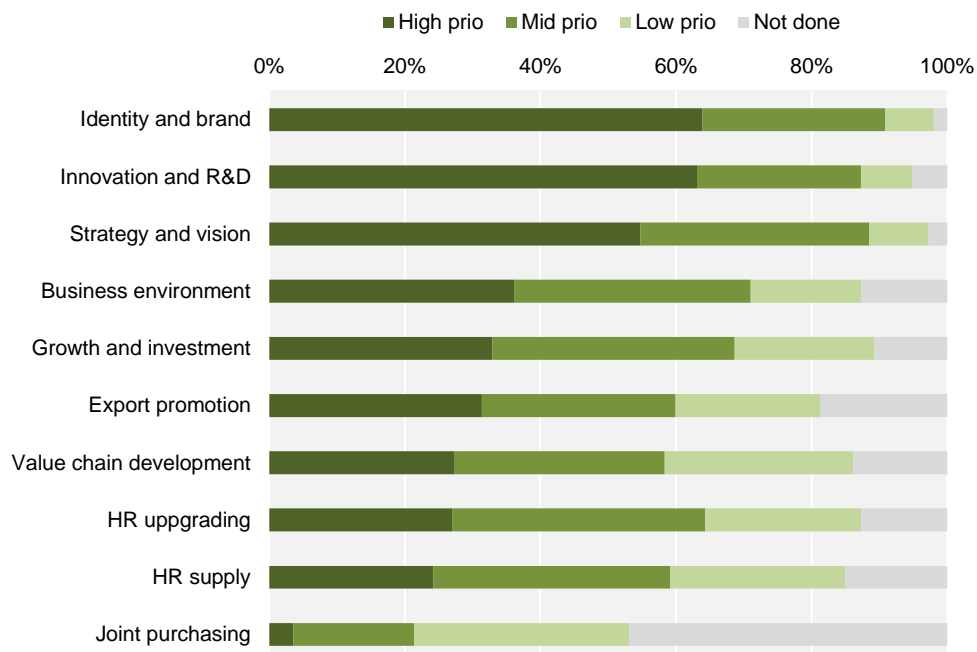
Younger CIs have a strong focus on identity and cluster/region branding. After a few years of existence strategy and vision becomes more critical (Figure 20).

Figure 20. High-priority shares for ten objectives, by CI age group
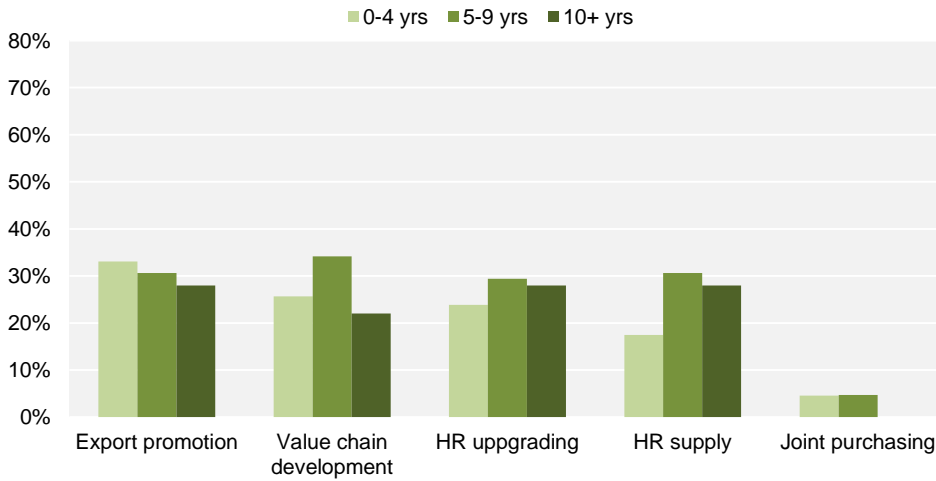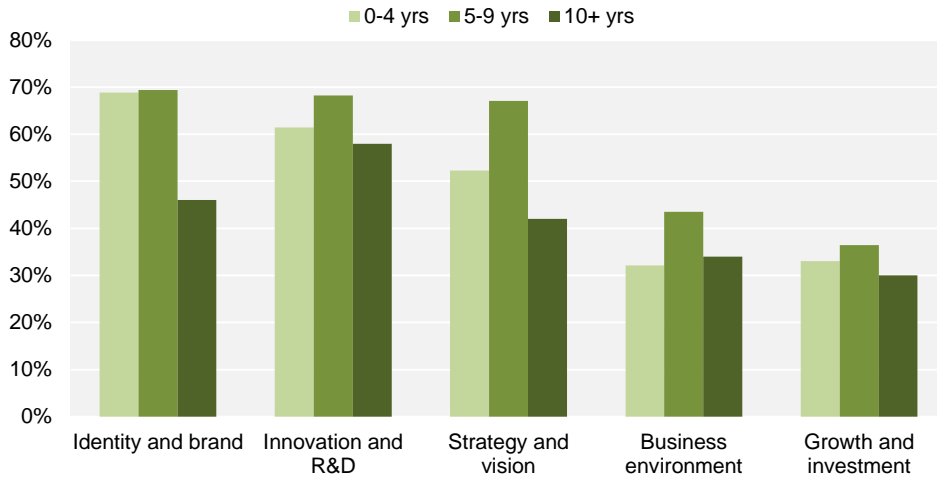
Innovation and R&D objectives are most critical to the larger cluster organisations (Figure 21). Larger CIs are also more prone to work with cluster growth and investment attraction from the outside.

Figure 21. High-priority shares for ten objectives, by staff size group
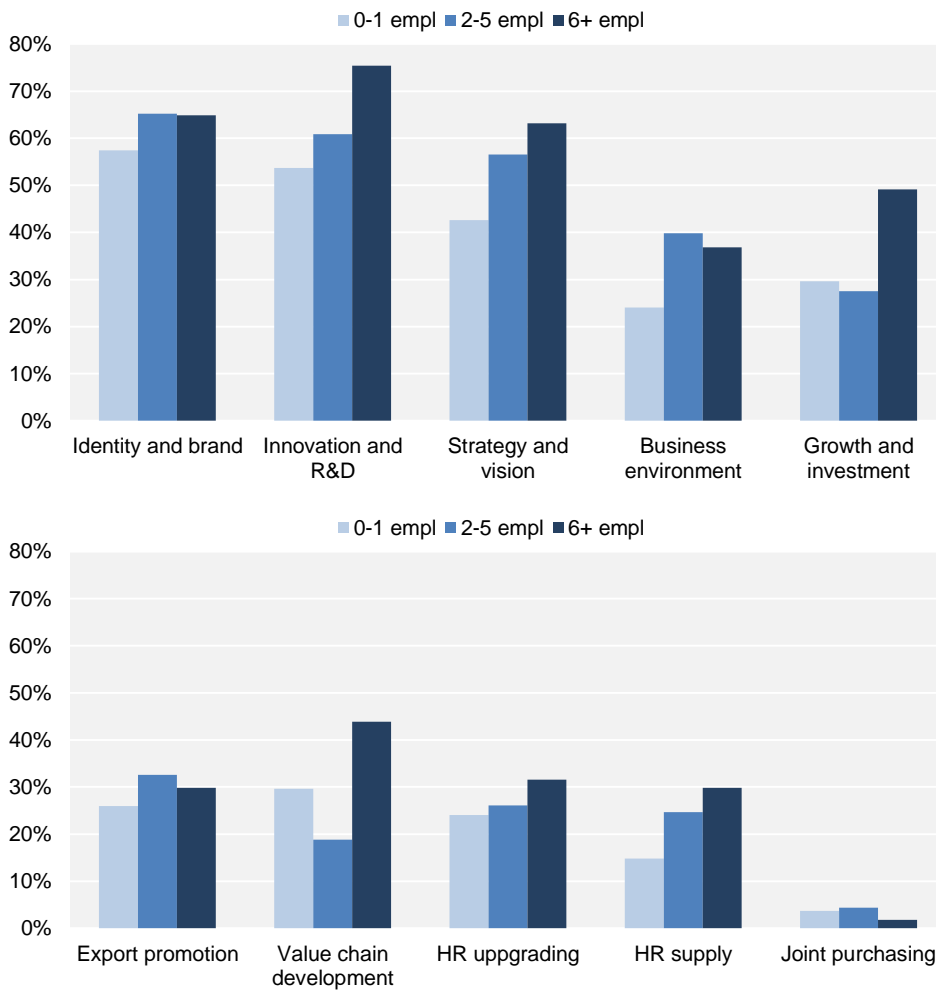
The cluster manager

To manage cluster organisations has become a profession. During the 1990s this was a novelty and many cluster mangers were true entrepreneurs, or as we labelled them in the Greenbook "*clusterpreneurs*". Now, cluster initiatives have turned into more stable organisations, and many cluster managers have been trained in cluster schools (e.g. Clusterland in Linz, IESE in Barcelona, REG X in Kolding). Furthermore, there is an organisation for cluster accreditation (ESCA), and a special club for cluster managers (ECMS). Many cluster managers are newcomers but some 20% now have more than 10 years of experience (see Figure 22).

Figure 22. Cluster manager's experience with cluster initiatives
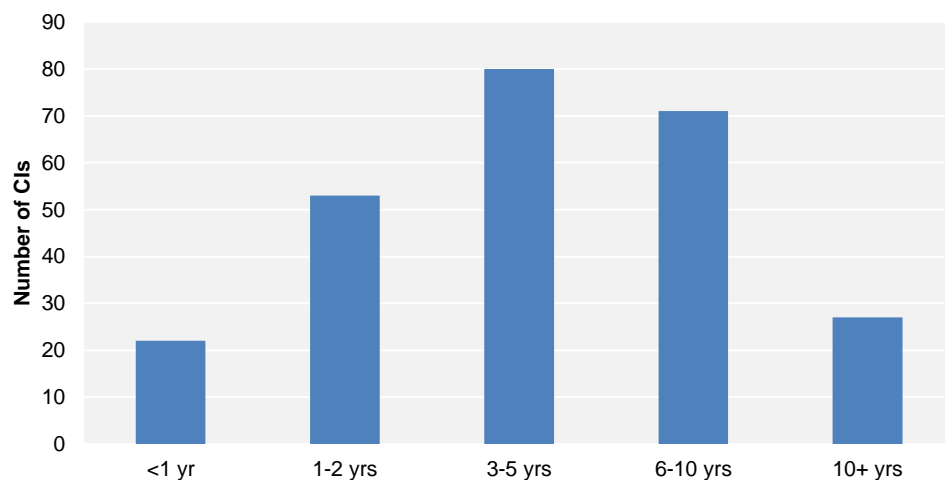
Governance

Cluster organisations typically follow a life-cycle, beginning with a project initiative that later evolves into a formal organisation. Out of all surveyed CIs in Europe, 65% are legal entities (e.g. non-profit, endowments), whereas 35% are projects belonging to some form of organisation (e.g. regional economic development unit or formal cluster umbrella organisation), see Figure 23. Private sector dominates CI boards (59%), with academia second (17%) and public sector officials third (15%). Board members from the financial sector play very limited roles (2%), see Figure 24.

Figure 23. Legal status of Cluster Initiative
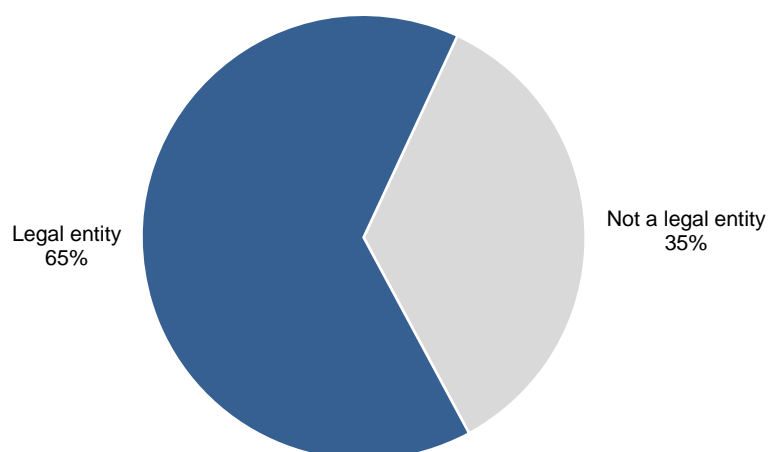
Figure 24. Average sectoral composition of main governing board
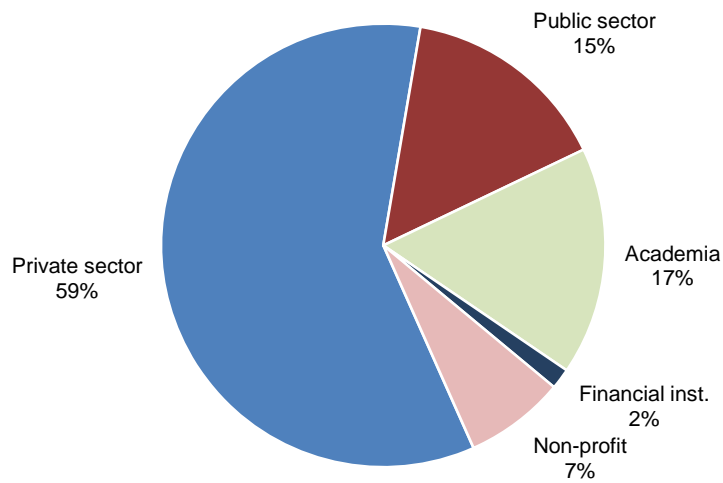
Evaluation

61% of European CIs are formally evaluated as opposed to 39% that do not have this as a requirement (Figure 25). As we discussed above cluster programmes should include rules regarding evaluation, and thus we think that 61% is still a very low figure. Formal cluster evaluation is critical for learning and adjustment of strategies, and ultimately for improved competitiveness of clusters in Europe. For CIs that are evaluated the frequency is high with yearly evaluations for some 90% of the organisations (Figure 26).

Figure 25. Share of CIs that are subject to a formal evaluation program
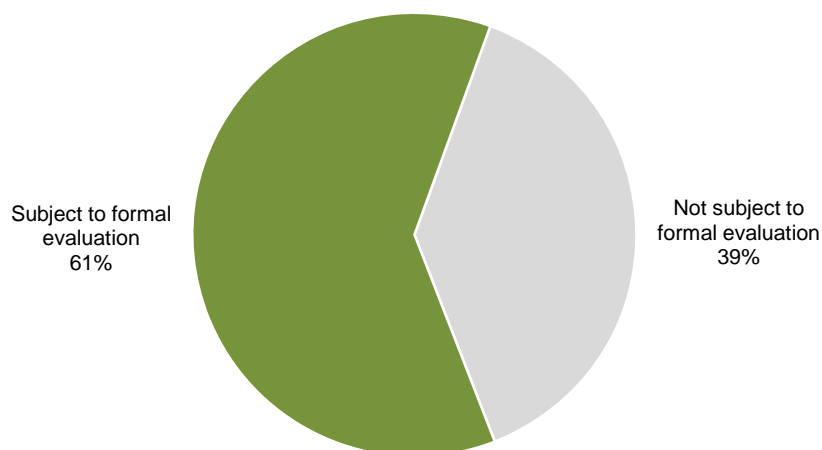
Figure 26. Frequency of data collection for evaluation
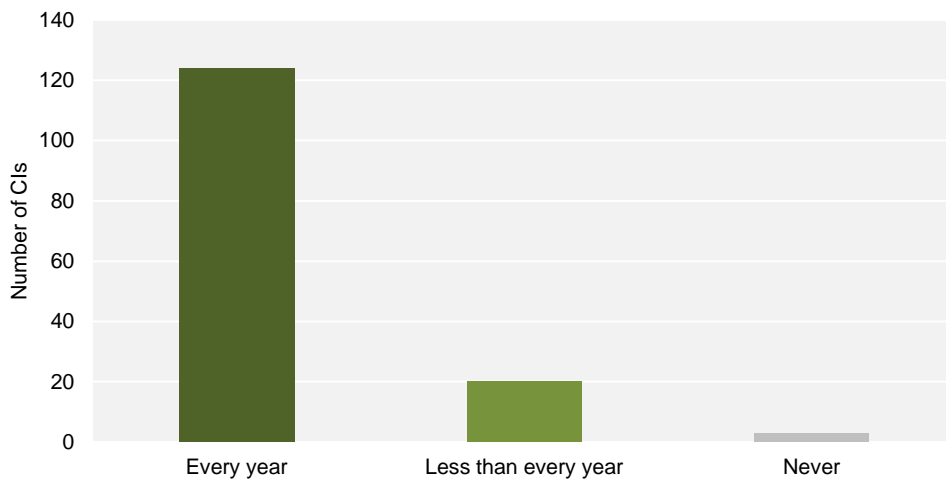
Data for evaluations range from surveys, to interviews, to peer benchmarking and industry statistics (Figure 27). Official statistics are used to a lesser extent which can pose a problem. As was discussed earlier, statistical control groups are for example critical to pick up outside explanatory factors.

Figure 27. Sources used for evaluation of CI performance
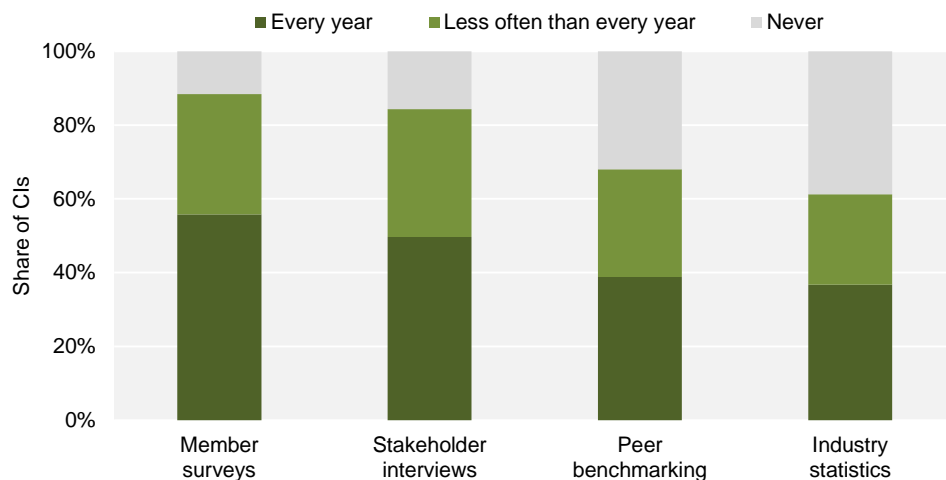
Performance of Cluster Initiatives

Three questions were used to measure **external performance** of the cluster initiative over the last three years: growth of cluster (number of firms, employment); innovation (new products and services); and international competitiveness of the cluster firms. Four questions referred to **internal performance** over the last three years: ability to meet deadlines; ability to meet goals; financial sustainability; and ability to attract new members and participants.

Evaluation measures

Figure 28. Measures used for evaluation of CI performance
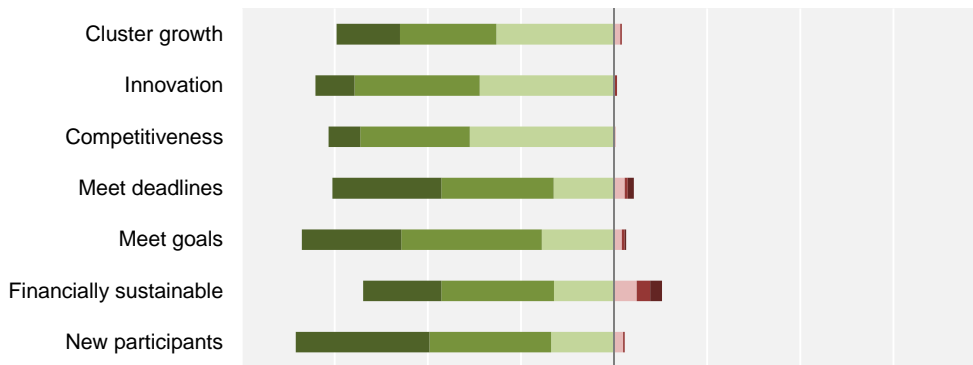
Note: Dark green represents the reply "Improved strongly" for the top three and "Strongly agree" for the bottom four performance indicators, and brighter green represent lower positive performance. Red shades represent negative performance.

Respondents reported overall positive results of the CIs (Figure 28). They reported best performance in attracting new participants, and least success in being financially sustainable.

The cluster manager's background

Figure 29. Relationship between cluster manager's experience with cluster initiatives and performance
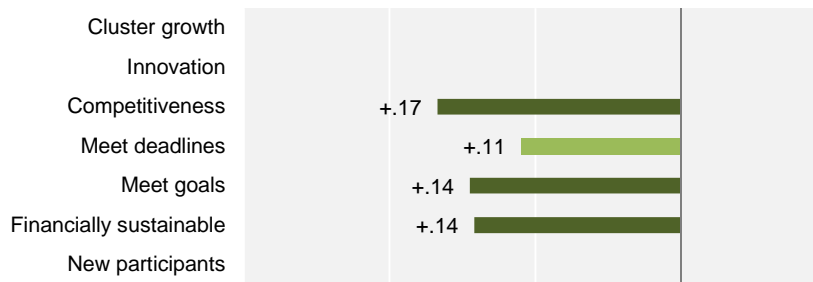
Note: This graph and the following similar graphs show correlations, measured by Kendall's tau. Dark green bars indicate correlations that are significant on the 1% level. Bright green correlations are significant on the 5% level. Less significant correlations are not shown.

The experience of the cluster manager, measured as the number of years working with cluster initiatives, is significantly related to internal performance, and also to performance in terms of improved competitiveness (Figure 29).

Figure 30. Relationship between cluster manager's work experience in the private sector and performance

Cluster growth	+.10
Innovation	+.11
Competitiveness	
Meet deadlines	
Meet goals	
Financially sustainable	
New participants	
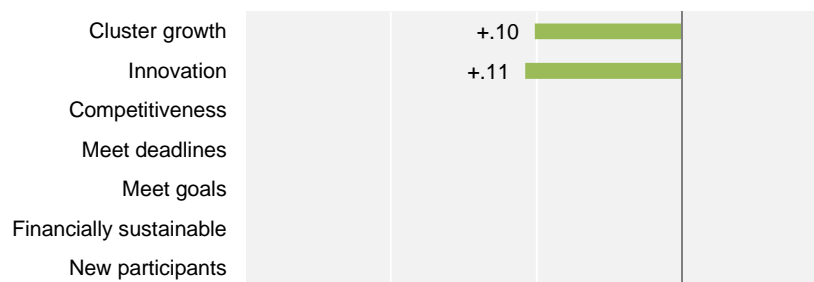
On the whole, the work experience of the cluster manager has little relationship to performance. The exception is work experience in the private sector, which has some relationship on cluster growth and innovation performance (Figure 30).

Staff and members

Figure 31. Relationship between staff size and performance
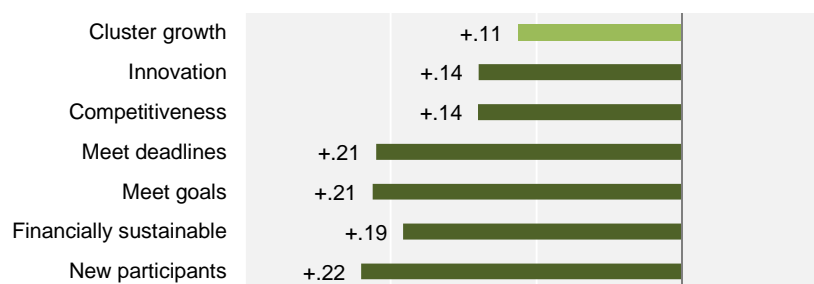
Cluster growth	+.11
Innovation	+.14
Competitiveness	+.14
Meet deadlines	+.21
Meet goals	+.21
Financially sustainable	+.19
New participants	+.22

Cluster initiatives with large staffs perform better in every aspect, both internally and externally (Figure 31).

Objectives

Cluster organisations that rate Innovation and R&D, Growth and investment, and Joint purchasing as high priority objectives, perform better in terms of cluster growth (Figure 32), and cluster organisations that rate Innovation and R&D, Strategy and vision, Growth and Investment, and Export promotion as high priority objectives perform better in terms of innovation (Figure 33).

Figure 32. Relationship between objectives and cluster growth performance

Objective	Value
Identity and brand	
Innovation and R&D	+.11
Strategy and vision	
Business environment	
Growth and investment	+.22
Export promotion	
Value chain development	
HR uppgrading	
HR supply	
Joint purchasing	+.12
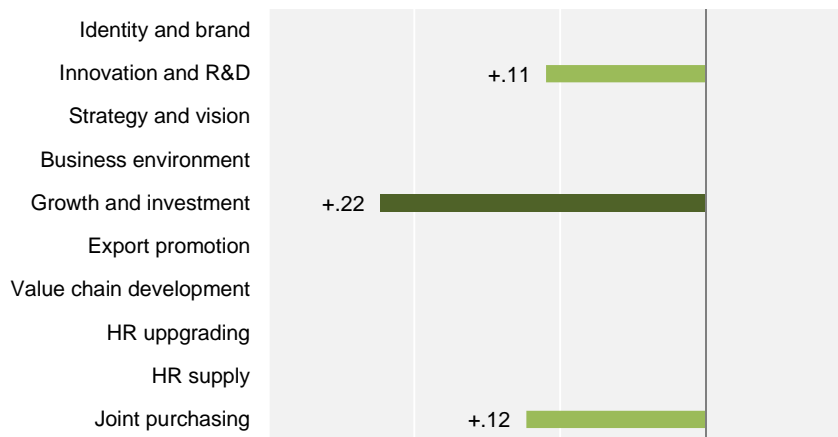
Figure 33. Relationship between objectives and innovation performance

Objective	Value
Identity and brand	
Innovation and R&D	+.14
Strategy and vision	+.13
Business environment	
Growth and investment	+.16
Export promotion	+.12
Value chain development	
HR uppgrading	
HR supply	
Joint purchasing	

Other factors

Among European cluster organisations there is no significant difference in performance between the CIs that were initiated through a public call or policy program, and those that were initiated by a private sector initiative. Nor does there seem to be any strong effect from whether the cluster initiative is organised as a legal entity or not.

Having a website, on the other hand, is strongly associated with many performance measures. Cluster initiatives with a website perform better in terms of innovation, competitiveness, meeting deadlines and goals, being financially sustainable and attracting new members than the very few that do not have a website. They are also better at improving collaboration with other clusters and global markets.

Having formal membership is strongly associated with financial sustainability and improved collaboration among firms.

Figure 34. Relationship between the cluster's international competitiveness and the CI's performance

Cluster growth	
Innovation	+.14
Competitiveness	+.36
Meet deadlines	+.23
Meet goals	+.24
Financially sustainable	+.19
New participants	+.18
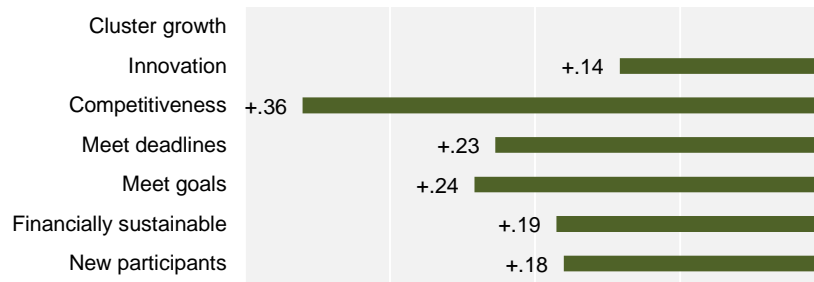
Not surprisingly, CIs that report on improved competitiveness are the ones with a strong underlying cluster. Again, this is line with the 2003 results in the Greenbook (Figure 34). This also goes for CIs working with important regional clusters (Figure 35).

Figure 35. Relationship between the cluster's regional importance and the CI's performance

Cluster growth	
Innovation	
Competitiveness	+.29
Meet deadlines	+.25
Meet goals	+.28
Financially sustainable	+.27
New participants	+.27
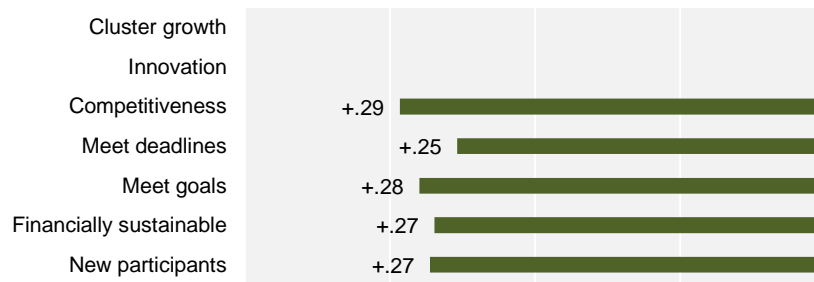
In clusters where firms have a high level of trust in government internal performance is enhanced (Figure 36). Even more prominent is the relationship to performance and the level of trust between firms. It is related to every internal performance indicator, and more weakly also to competitiveness performance (Figure 37).

Figure 36. Relationship between firm's trust in government and the CI's performance

Cluster growth	
Innovation	
Competitiveness	
Meet deadlines	+.14
Meet goals	+.19
Financially sustainable	+.18
New participants	
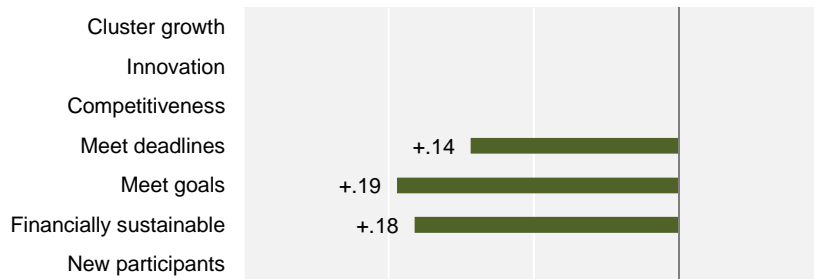
Figure 37. Relationship between trust in business relationships and the CI's performance

Cluster growth	
Innovation	
Competitiveness	+.12
Meet deadlines	+.15
Meet goals	+.22
Financially sustainable	+.18
New participants	+.17
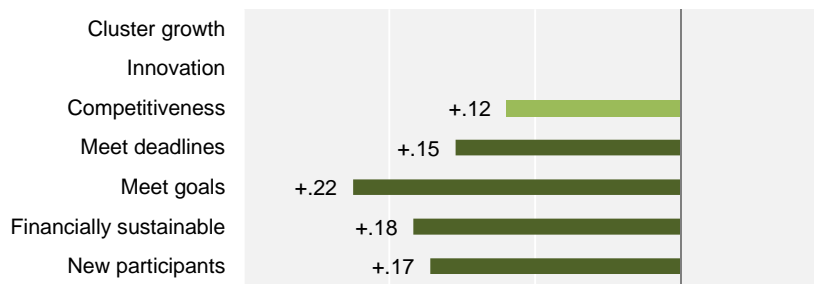
Similarly, an environment where government policy is perceived as stable and predictable is related to better in internal performance (Figure 38).

Figure 38. Relationship between stable and predictable government policy and the CI's performance

Cluster growth	
Innovation	
Competitiveness	
Meet deadlines	+.15
Meet goals	+.16
Financially sustainable	+.13
New participants	
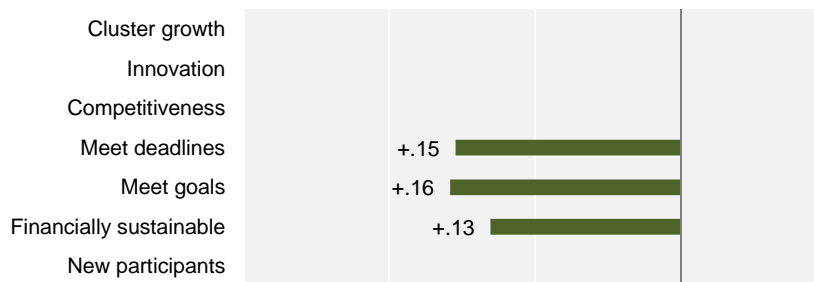
Chapter 3

Clusters Organisations as Bridge Builders

Well-functioning clusters are particularly beneficial places for innovation. To understand why, we must see the cluster as a collection of linked actors of different kinds (Figure 39). The most important type is the firm. It is firms that take innovations to markets and subject them to the test of competition. Another type is research organisations, for example research institutes, which produce new advanced knowledge. A third type is education organisations, such as schools and polytechnics. Universities are a special case, because they often play the double role of being both research institutions and education institutions. A fourth type is the capital providers, such as business angels, venture capital firms and banks, who provide the financial resources needed for the exploitation of inventions and new business models. And, fifth, government and public bodies include actors that make and implement policy decisions about public infrastructure investment, regulations, and many other factors that are important for innovation. This type includes many levels of government, from national to local, and a wide range of public agencies.

Figure 39. Five types of actors in a cluster
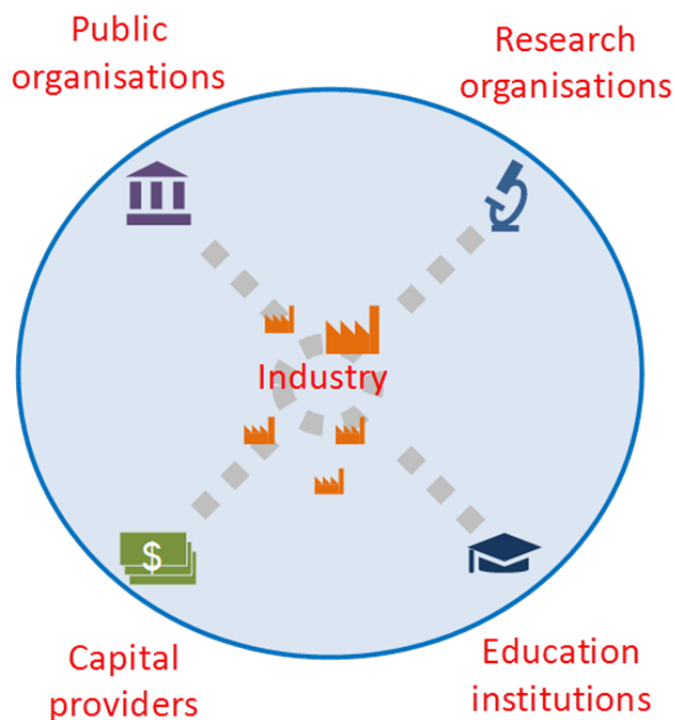
The reason clusters are relevant for innovation is that when there is a critical mass in a location of a sector or industry, the different actors can support each other, and resources can be arranged and rearranged in flexible ways. But critical mass is not enough; the actors must be connected in various ways and there must be mobility of resources and skills, including technological spill-overs.

Universities offer research groups that produce cutting-edge knowledge in relevant fields, and can channel those findings to the firms in the cluster or initiate start-ups. Colleges offer specialised education programs and graduate students with skills particularly suited for working in the cluster. Capital providers become experts in the cluster's field, and can provide "smart money" by being better at assessing risks and opportunities in the cluster's business. Local government and public agencies learn to understand the needs of the firms, and make decisions that promote the cluster and removes obstacles to progress. In all these ways other agents support the firms and make it easier for them to be competitive and grow. Also, not least important, firms interact with other firms. Small firms interact with large firms, domestic firms interact with multinationals. They use each other as buyers, as suppliers, as technology partners, as places to find trained staff, as sources of new ideas to imitate, or simply as an inspiration to aim higher and set more ambitious goals.

The figure above is one way to illustrate all these interactions in a cluster. There are five different types of agents, and between them there are paths along which one agent can interact with another. One path or perhaps rather one set of paths, runs between research organisations and firms, another between government and firms, and so on. In an ideal cluster these paths are busy with traffic. People move between actors, talk with others, bring news to others, discuss with others, change jobs, and tie the systems together in a thousand different ways. All this traffic helps make the cluster dynamic. Knowledge is spread and shared. Collaboration ensures that resources are used in the best possible way. Coordination aligns the interests and actions of different agents.

Innovation Gaps and Bridge Builders

The figure above is a compelling picture. It shows the cluster in an ideal way. It is the kind of cluster everyone wants. Unfortunately, in reality most clusters don't look like this at all. In real clusters, communication between different kinds of agents is massively flawed. Small firms who believe they have something new exciting to offer, have a hard time even to be allowed to meet with the right people at a large enterprise. Large enterprises searching for a new supplier are more likely to look for an established international supplier than to go searching among innovative SMEs located right under their nose. Policy makers have only vague ideas about what business really needs. Researchers are more interested in academic publishing than commercialising their new findings or talking to business people. Schools formulate their curricula oblivious to what skills the industry is calling for. Entrepreneurs find it difficult to persuade banks to invest in new innovative businesses. Many business people would laugh at the idea to approach the local university to see if they have some new technology or skill they could develop jointly.

It is not difficult to understand that these connections will not just happen spontaneously. After all, the different types of actors have different roles to play in society. Universities are supposed to do research, not to serve R&D departments of companies. Policy makers have responsibilities that go far beyond serving companies with whatever they require. Education organisations have many other stakeholders than firms to oblige. And firms are in business to make a profit for themselves, not to provide altruistic support to each other. Even so, with some additional effort put into coordination and collaboration, large benefits could be reaped, which now remain neglected.

In other words, more often than not, clusters in real life do not live up to the potential that cluster theory grants them. Clusters possess tremendous potential, but in most cases, this potential remains largely untapped. At first, these immense missed opportunities may seem hard to accept. If the world is a place that is constantly moving towards an ideal equilibrium, a state of efficiently used resources, it seems unlikely that this kind of gross misalignments could endure. After all, why

would clusters not make the best possible use of the potential they enjoy? When all that is needed is a little interaction, why should these possible benefits remain untapped?

The answer is that this interaction between agents is not such an easy thing to do. If all it would take was a simple phone call from one person to another, then clusters would surely be a lot more dynamic. But in reality, there are thousands of reasons why that phone call never takes place. The policy maker doesn't pick up the phone, because she doesn't expect to hear any deeper insights from the industry of what they really need, only than the predictable call for lower taxes or trade protection. If the college teacher talks to the business world, it is about finding placement positions for the students, or arranging a recruitment fair, but certainly not to discuss the curriculum. The businessman has no idea what the researchers at the university are doing, he probably doesn't know their names and he certainly doesn't know under what departments they are organised. The researcher might want to see her latest discovery turned into a successful commercial innovation, but she knows that her career depends on publishing papers, and it will in no way be furthered by hobnobbing with business people; in fact, it will be hampered. And if, by chance, the businessman and researcher would meet and discuss each other's work, they would soon find that they speak different languages and have different mind sets, almost as if they were living in different worlds.

What this all means is that there are obstacles to interaction leading to gaps between the five sub-systems of the cluster. Obstacles make it difficult for actors to communicate with each other, to give each other information, to initiate collaboration, to pass on knowledge. Figure 40 below gives a list of such obstacles.

Figure 40. Different types obstacles leading to gaps in a cluster

Weak obstacles → interaction	Strong obstacles → gaps
Good knowledge	Poor knowledge
Dense networks	Sparse networks
Common "language"	Different "languages"
Similar norms and attitudes	Different norms and attitudes
Shared vision	Different visions
High trust	Low trust
Positive incentives	Negative incentives

It is obstacles like these that prevent the research world to spread its new knowledge to the business world, and that stop policy makers from seeking advice from business people. Obstacles make traffic slow and awkward where it should be rapid and easy. Obstacles isolate systems when they should be connected. In short, obstacles create gaps where there should be paths. The picture of the cluster that we sketched above, with its wide paths and its intense traffic, is not a picture of a real life cluster. Real life clusters have obstacles, much like the rivers and streams that a path has to cross.

This has great implications for innovation and competitiveness. It means that clusters despite their great potential for dynamic interaction between agents, often only exploits a small share of this potential. People do not make the most of the possibilities found around them, because they simply lack knowledge about what opportunity is nearby, they lack the networks to utilise it, they fail to

initiate collaboration they would benefit from, and they fail to coordinate their actions with others. In summary:

+ Knowledge failures
+ Network failures
+ Collaboration failures
+ Coordination failures
= Innovation failures

This is where cluster organisations come into the picture. Cluster organisations are particularly apt to increase the competitiveness and growth of clusters by bringing different types of actors together (Figure 41). They connect business with academia, education with industry, large firms with small firms and so on. They do this by providing activities and meeting places where common issues can be discussed and acted on jointly. They help the different agents overcome the obstacles and start talking to each other. In doing so, they get the traffic moving along the paths. One could say that what cluster organisations do is to construct bridges that allow the traffic in the cluster to flow; and not only inside clusters. Cluster organisations can also facilitate bridges and enhanced traffic to other clusters for cross-fertilisation, and to global markets and value chains (the two external gaps). In summary we can talk about seven innovation gaps where cluster organisations play critical roles as bridge builders:

- The research gap, limiting interaction between firms and research organisations
- The education gap, limiting interaction between firms and education organisations
- The capital gap, limiting interaction between firms and education organisations
- The government gap, limiting interaction between firms and public bodies
- The firm-to-firm gap, limiting interaction among firms
- The cross-cluster gap, limiting connections between firms in one cluster and another
- The global market gap, limiting connections between cluster firms and global markets

Figure 41. Cluster organisations bridging the seven innovation gaps.
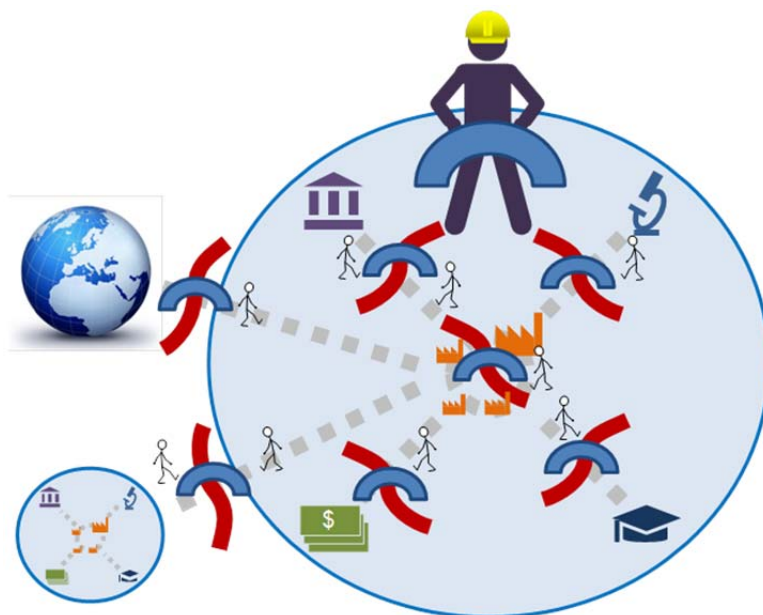
So the question looms; where are bridges built and how successful are European cluster organisations in closing the innovation gaps? To this we turn next.

Cluster Managers' Contact Patterns

Cluster managers in Europe are most frequently in touch with firms in the cluster, helping to close the firm-to-firm gap. More than 80% are in touch with firms at least every week. Cluster managers interact the least frequently with financial institutions, and outreach to other clusters and international markets are also relatively less frequent (Figure 42).

Figure 42. Frequency of cluster manager contacts with other persons in various sectors
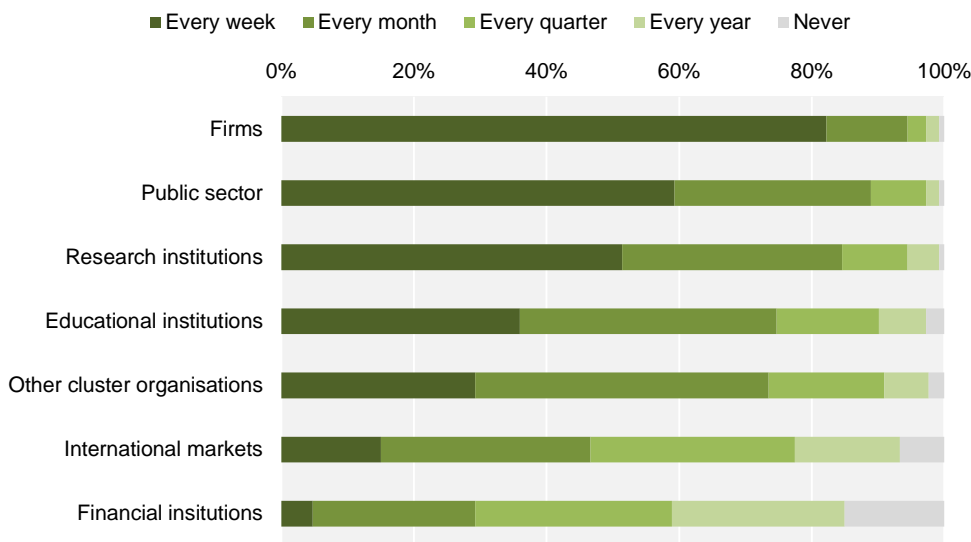
Over 80% of cluster initiatives consider promoting collaboration between firms a high priority in order to reach their goals. The priority that are given to the gaps is the same as the frequency that cluster managers are in touch with actors, with one exception. Although collaboration between firms and the public sector is ranked as less of a priority than with research institutions and educational institutions, cluster managers none the less are more frequently in touch with the public sector than with research institutions and educational institutions (Figure 43).

Figure 43. Level of priority for seven types of collaboration promotion
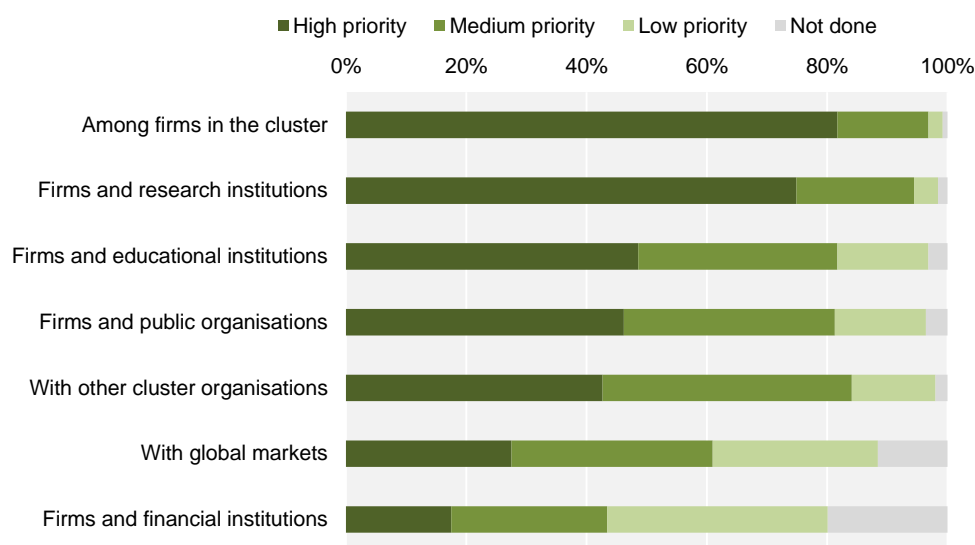
The priority given to promoting collaboration with one type of actor is clearly reflected in how frequently cluster managers talk to those actors. For example, in cluster initiatives where collaboration between firms is no/low/mid priority, 67% of cluster managers are in weekly contact with firms, whereas where it is a high priority 86% are in weekly contact with firms. Again, the public sector is the exception. 59% or cluster managers are in weekly contact with the public sector, regardless of how high priority firm-to-public sector contacts are given.

However, a high priority given to one type of actor can also be related to increased cluster manager contacts with other types of actors, as shown in the table below. For example, high priority given to firm-to-research collaboration is strongly associated with frequent research contacts but also frequent education contacts. Firm-to-finance priority is strongly associated with contacts with the education sector.

Table 3. Correlation between objectives and contacts

	Priority of collaboration promotion						
Cluster manager's contacts	Firm to firm	Firm to re-search	Firm to edu-cation	Firm to public	With other clusters	Global markets	Firm to finance
With firms	.11	.06	.03	.03	.10	.02	.07
With research	.03	.20	.04	-.02	.12	.04	.06
With education	.07	.18	.17	.06	.13	.05	.16
With public sector	.00	.01	-.02	-.03	.05	-.05	-.03
With other clusters	.12	.06	.00	-.02	.10	.06	.07
With global markets	.00	-.02	-.04	-.03	.06	.13	.02
With financial inst.	.10	.09	.09	.12	.09	.14	.30

Bridge Building Performance

As show in the figure below, CIs report the highest impact on improved collaboration among firms in the cluster. 89% report improvements (over the last three years) in collaboration among firms. Similar results are reported for collaboration firms-research institutions, and for collaboration with other clusters.

Figure 44. Impact of CI on interaction and collaboration
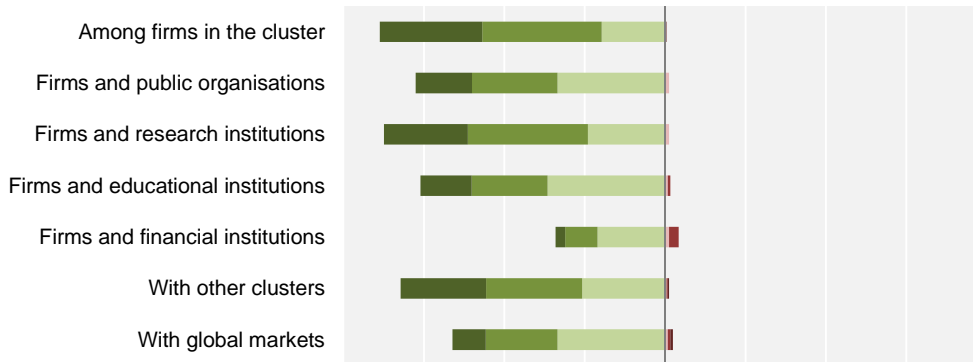
Note: Dark green represents the reply "Much better", and brighter green represent lower positive performance. Red shades represent negative performance, down to "Much worse".

Contacts lead to improved performance of clusters. For example, improved innovation is significantly related to cluster managers that have frequent contacts with financial institutions, other clusters, and global markets (Figure 45).

Figure 45. Relationship between cluster manager's contacts with various sectors and innovation performance
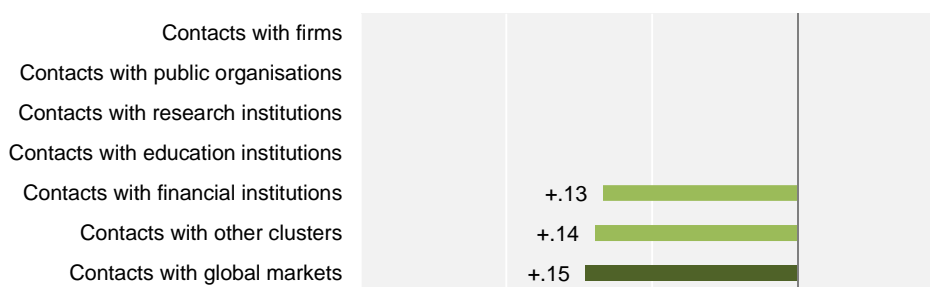
Performance and priority of collaboration

The higher priority a CI puts on collaboration among firms, the better is performance in every aspect, both internally and externally (Figure 46).

Figure 46. Relationship between priority of collaboration among firms and performance

Cluster growth	+.20
Innovation	+.19
Competitiveness	+.15
Meet deadlines	+.18
Meet goals	+.14
Financially sustainable	+.17
New participants	+.15
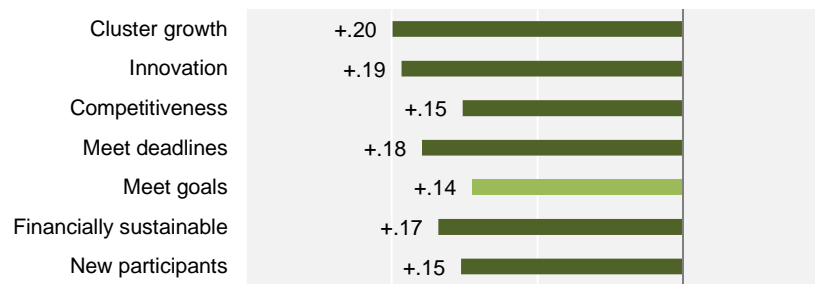
A higher priority on collaboration with financial institutions is significantly associated with Cluster growth, Innovation, and attracting new participants, see Figure 47.

Figure 47. Relationship between priority of collaboration between firms and financial institutions and performance

Cluster growth	+.23
Innovation	+.14
Competitiveness	
Meet deadlines	
Meet goals	
Financially sustainable	
New participants	+.14
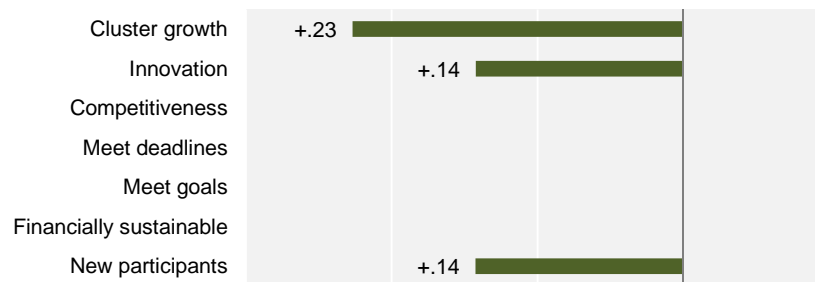
Chapter 4

Cluster Policy in Europe

When the new literature on clusters in the early 1990s established their relevance in the modern economy, most of the writing was focused on documenting and analyzing the presence of clusters. But the compelling evidence that cluster presence was related to higher economic performance almost immediately caught the attention of policy makers. In regions like the Basque Country in Spain, where the traditional economy was in crisis and the government in need of a new economic policy approach, these new ideas were quickly taken on board (Aranguren, Larrea, & Navarro, 2006). At the time, however, the conceptual understanding of how cluster-oriented economic policy should be organized was still in its infancy. There was also no experience or data that could guide policy action.

The European Cluster Observatory has over the last couple of years made an important contribution to a fact-driven policy debate about the role of clusters in the European economy. At the level of the European Commission, it has informed a succession of reports written by high level policy groups as well as Commission communications on clusters and cluster policy (see box below). At the level of member countries, its data has been frequently used in policy discussion. At the level of cluster initiatives, it has been a source of data as well as a platform for communication and interaction.

Key European Cluster Policy Groups

The **High Level Advisory Group** on clusters was established in December 2006 under the Europe INNOVA Initiative and was part of the activities of the Europe INNOVA project to identify and analyse regional clusters in Europe. The High Level Advisory Group was chaired by Senator Pierre Lafitte, founder of Fondation Sophia-Antipolis and was composed of high level experts in the area of cluster policy development, the business community and academia, representatives from the cluster-related projects funded under the PRO INNO Europe initiative, and the Europe INNOVA initiative, as well as representatives from industrial and regional associations. The Group's work resulted in the **European Cluster Memorandum**,[1] a document signed by many of the leading regional development agencies in Europe outlining their commitment to the use of cluster programs as well as their suggestions to the European Commission as to what the Commission could do to strengthen the quality of cluster efforts across Europe.

In October 2008 the European Commission took the initiative to establish a **European Cluster Policy Group (ECPG)** with a mandate to advise the Commission and Member States on how to better support the development of more world-class clusters in the EU. Through an open call for applications, 20 high-level members with a diverse background and outstanding expertise were selected in March 2009 for a term of 18 months. The Group was chaired by Tea

---

[1] http://www.proinno-europe.eu/newsroom/european-cluster-memorandum-sent-stakeholders-commitment-cluster-agenda-0

Petrin, former Minister of Economy in Slovenia and professor at the University of Ljubljana. The ECPG presented its recommendations for future cluster efforts in Europe at the first European Cluster Conference held in Brussels, September 30th. The **ECPG Final Recommendations – A Call for Policy Action** highlighted three principles and eight action proposals for EU institutions and Members States to take on board. A complementary report (Consolidated Set of Policy Recommendations on Four Themes) provided a summary of the suggested actions related to the four themes addressed during the Group's mandate.[2]

Since early 2012, the **European Forum of Clusters in Emerging Industries** focuses on the role of clusters as accelerators and drivers of emerging industries in Europe. The Forum is composed of 15 experts in the area of cluster policy, cluster management and cluster business.

The Case for Cluster Policy[3]

Economists regard policy interventions as justified when specific conditions restrict the ability of the normal market process to lead to optimal outcomes from an overall welfare perspective. Such "market failures" underlie the traditional motivation for economic policy. The local externalities that give rise to clusters constitute market failures such as—

- coordination failures, because individual companies take account only of the impact that their decisions have on themselves, not on others, be it about whether to locate in a cluster or what investments to undertake there.
- information asymmetries, for even if companies wanted to consider the impact their actions have on others, the knowledge necessary to make the right "social" decision is dispersed among the cluster's many participants.
- path dependency, for decisions of cluster's participants today affect the cluster's possible evolutionary path in the future. Coordination failures and information asymmetries in making these decisions thus have a dynamic dimension as well. Moreover, social and private discount rates might differ—an additional source of market failure.

If cluster policy addresses such market failures, it does not diminish global welfare. Under some assumptions, the free competition between rational governments in supporting clusters even leads to the best possible outcome, not a race to the bottom (Norman & Venables, 2004). Although these arguments do not prescribe specific policy interventions, they do indicate the direction that cluster policy should take. Policy intervention should always target the market failure at its source. Policy can subsidize activities that are underprovided because of coordination failures or differences in discount factors. And policy can facilitate platforms for collective action to overcome coordination failures and information asymmetries. Figure 48 below depicts this argument graphically.

Figure 48. The case for cluster policy
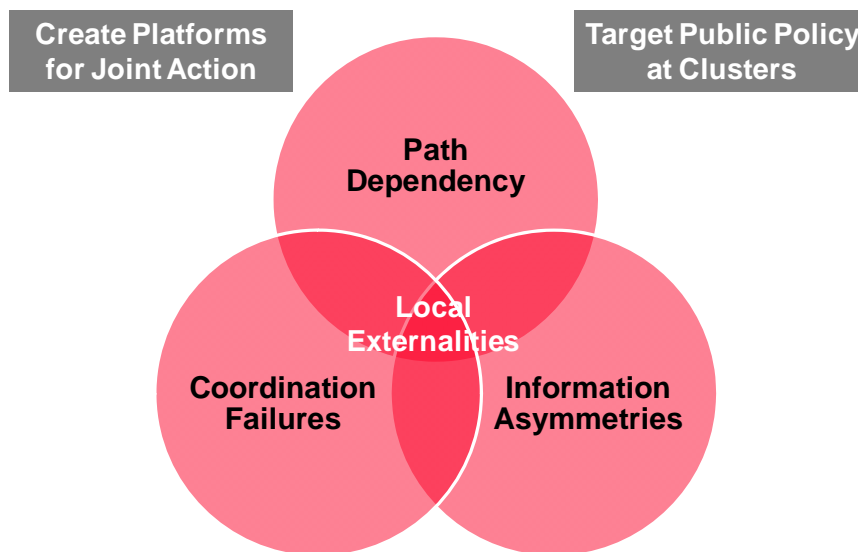
Policy approaches can be compared for both their actual impact (in addressing the problem or market failure) and their potential costs (in leading to distortions or government failure). Figure 49 below shows the relative mix of impact and distortions for different policy approaches. Policies that target individual companies are highly effective but also very distorting. Policies that target the entire economy are only slightly distortionary, if at all, but they are often also not very effective. Policies aimed at individual industries come somewhere between these two poles. Cluster policy, however, offers a superior mix of benefits and costs. It is organized around a group of industries that by definition have strong linkages. Aiming policy at them will thus not only be effective but will even trigger additional benefits from positive spill-overs that are induced. The policy is neutral within the cluster where competition for factors of production is the sharpest; it is distortionary only relative to activities outside the cluster, where other skills and assets are needed by definition. Although some distortion remains, the approach promises a potentially better balance of effects.

Figure 49. Impact and neutrality of government policies
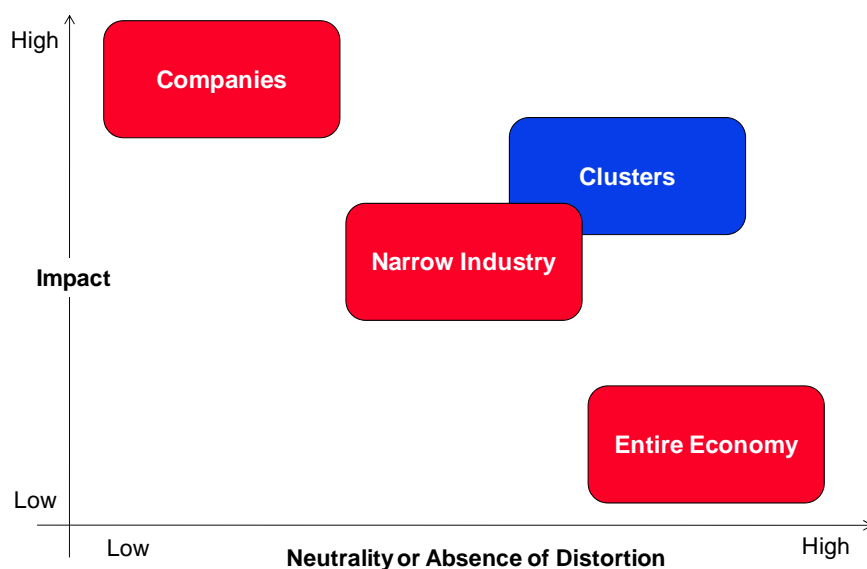
In practice, efforts to grapple with market failure are never perfect (Rodrik, 2008). They suffer from government failures in implementation (some reasons for which are lack of knowledge to target the intervention, inability to provide incentive-neutral funding, and incapacity to resist political pressure by interest groups seeking beneficial treatment) and might have unintended side-effects, entailing collateral costs that outweigh the benefits. This observation is also true for cluster policy and has led to a debate on whether cluster policy is useful or harmful.

The Theoretical Debate about Cluster Policy

In the academic debate the strongest criticism of cluster policy does not come from researchers who claim that locational factors are irrelevant but rather from economic geographers and others who fully subscribe to the view that locational factors are important. Some analysts disapprove of the "fuzzy" nature of the cluster framework (Martin & Sunley, 2003). Their criticism raises some pressing conceptual issues but has little relation to the practical problems policy-makers face when deciding on whether and how to implement cluster policy. It has also been challenged on more conceptual grounds (Benneworth & Henry, 2004; Motoyama, 2008). A more fundamental criticism of the motivation for cluster policy (Duranton, 2011) turns out to be highly revealing for how the lack of a generally accepted definition of cluster policy continues to hamper the debate. To understand these different views on cluster policy, it is useful to go back to a simple diagram that relates agglomeration to competitiveness (see Figure 50 below). The evidence discussed in the section on clusters and economic performance, above, points to a positive relationship between the two dimensions, a fact that is generally accepted by critics as well as advocates of cluster policy. (As discussed above, there is disagreement on how tight this relationship is relative to other factors.) But how should cluster policy intervene to move a location from a place at the bottom left to the top right? This question is where the fundamental difference comes in.

Figure 50. Two perspectives on cluster development
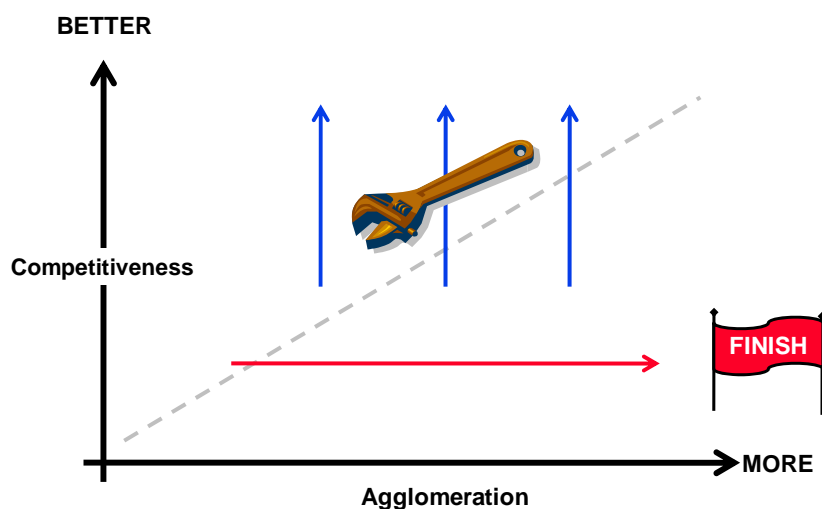
In one approach agglomeration is the key policy lever; as agglomeration progresses, competitiveness will naturally follow as cluster effects set in. With agglomeration as the ultimate goal, efforts to attract companies through incentives—ranging from tax rebates to free infrastructure—naturally come to the forefront of the policy debate. Economic geography-based approaches, too, center on the effects of traditional tax, trade, and regional policies on agglomeration patterns (Baldwin, Forslid, Martin, Ottaviano, & Robert-Nicoud, 2003). Dynamic models in "new economic geography" provide guidance on when and how these instruments should be used in order to have maximum impact (Brenner, 2003, 2008): The process of agglomeration is characterized by crucial junctures at which patterns of economic geography are determined. For economic policy, this observation implies that intervention has to occur early—before the crystallization of the patterns that determine the future location of a dominant cluster. That intervention also has to be massive, meaning that it must give a boost so significant that the location acquires critical mass in order to far surpass all potential rivals. And it implies a priority on identifying a few clusters on which economic development then hinges.

If massive targeted subsidies in the early phase of cluster emergence are the policies under discussion, should they be used? Critics of cluster policy are not the only ones who counsel against resorting to them, for such policies require the policy-maker to have an abundance of information and ability and are therefore likely to fail. Furthermore, there is debate as to whether such policies could even have sufficient effect. With current economic geography being aligned with the fundamentals, some researchers find that policies encouraging a marginal company to change location have very limited impact on the productivity of other companies (Martin, Mayer, & Mayneris, 2008). Other analysts arrive at opposite results, with significant implications for the productivity of companies in the proximity of companies that have changed location (Greenstone et al., 2010).

In another approach competitiveness is portrayed as the vital policy lever; as competitiveness builds, agglomeration will naturally increase as the cluster becomes more attractive for new entrants (Rodriguez-Clare, 2005). With competitiveness as the ultimate goal, clusters become a process tool to design and implement policies more effectively. The instruments then targeted at existing clusters are well known from innovation policy, regional policy, and enterprise policy. They are supplemented by actions that specifically favor collaboration on their use and that create platforms for collaboration within an agglomeration. The competitiveness literature, including the insights on

cluster evolution, offers guidance on when and how to use these instruments. This assistance, though, is radically different from the model that critics of cluster policy have in mind. The focus should be mainly on agglomerations that have already passed the early stages of development (Rodriguez-Clare, 2007). In other words, the fundamental conditions for economic success are in place, and active collaboration can become a "turbo" for the use of existing strengths. The emphasis of policy interventions should be on enabling collaboration and channeling resources in a different way, using moderate amounts of new funding. Major new funding is not necessary and could become harmful by compounding the potential for distorting incentives. And though a selection of clusters is needed for the commitment of sufficient resources and attention to any one initiative, economic development is the result of many clusters in all regions that are flourishing, not just a few per country.

If these policies are the ones under discussion, should they be used? Even the critics of cluster policy have a slightly favorable view: Improvements in the fundamentals of competitiveness are a sensible goal, and the suggested approach mitigates their downside. But they remain skeptical about whether cluster efforts can sufficiently promote underlying competitiveness. Proponents of cluster policy, meanwhile, see enough evidence that such efforts can in fact lead to a much more meaningful implementation of policies for honing competitiveness.

The Future of Cluster Policy

Although the understanding of cluster programs is growing, there is still too little systematic data on their impact. The European Cluster Observatory provides systematic, comparable data on the presence of clusters. The data on cluster policies and efforts remains more case-based, but has also grown in size to allow for broader analyses of cluster efforts and economic outcomes.

Surveys of cluster initiative-managers indicate that a large share of such efforts is active in clusters with a strong base of existing economic activity in the region. While 'wishful thinking'-clusters do exist, they do not seem to dominate the reality of cluster efforts (Sölvell et al., 2003; Ketels et al., 2006). Cluster initiatives empirically are more focused on raising the competitiveness of existing clusters rather than on creating new ones. The survey-based findings on the drivers of cluster initiative success are consistent with this view: A strong existing cluster with firms that have met the market test makes it much more likely that a cluster initiative will report its efforts to be successful. A second import success driver is the presence of a strong regional government. Cluster initiatives are highly heterogeneous in performance and structure, which suggests that how cluster initiatives are organized and what type of activities they get engaged in has an important impact on the outcomes they achieve. The surveys indicate that the qualities of the cluster initiative manager and an appropriately funded secretariat are key success drivers. There is no indication of any 'killer application that cluster initiatives have to pursue. Instead, the data suggests that the mix of activities needs to be aligned with the specific needs of the cluster (Lindqvist et al., 2003).

As reported earlier the data on the impact of cluster initiatives on economic outcomes is still fragmentary. The available evidence points to moderately positive effects (e.g., for Germany: Dohse & Stähler, 2008; Falck et al., 2008). The reviews of individual programs tend to find positive returns for the participants and an expanded capacity for joint action (e.g., for the Swedish Vinnväxt program: Cooke et al., 2007). Studies in Denmark and Sweden have made peer group comparisons of companies active in cluster projects and those that are not (Kuhn et al., 2011). They find companies active in cluster projects to register better performance in subsequent years. Some studies in other countries have shown no such impact; instead, there is evidence that their funding decisions have been strongly influenced by the traditional industrial policy reflex to support failing activities (e.g., Martin et al. 2011 on a program in France). These firm level studies provide more robust evidence than what has been available before. But given their design they can only provide information about the effectiveness of individual cluster programs, not about the impact or advisability of cluster programs in general.

The existing evidence suggests that cluster programs can play an important role in the context of a broader strategy for upgrading competitiveness. To enhance their impact, a three-step approach seems critical: The first step is to ensure more consistent quality in the design and implementation of cluster efforts. The high level of heterogeneity in the outcomes of programs that claim to be based on the cluster approach signals the need for stronger standards. The European Commission can play a role in this process in two important ways: For cluster initiatives, the Commission can establish benchmarks and standards and promote their application. This is currently under way in the European Excellence Initiative. One focus is on benchmarking cluster initiatives, culminating in the labeling of cluster initiatives.[4] The other is on the training of cluster initiative managers, which is currently under preparation through the Foundation "Clusters and Competitiveness"[5] For member countries, the Commission could establish standards of good cluster programs. Countries or regions that follow these standards could then be eligible for co-financing from the European Commission (European Cluster Policy Group, 2010). A group of leading countries and regions has in parallel developed their own proposals on "the perfect cluster program" (Danish Ministry of Science, Innovation, and Higher Education/VDI/VDE, 2012).

The second step is to scale up the impact of cluster programs. Simple arithmetic suggests that working with one regional cluster, even a sizeable one, is unlikely to generate economic outcomes that are meaningful for the overall regional economy. The average regional cluster accounts for about 1% of total employment in a region (European Cluster Observatory, 2008); larger clusters, maybe up to 5%. Upgrading one cluster will tend to have only a moderate impact on the regional economy overall. There is a range of ideas for how cluster policy can be designed to affect the regional economy (High Level Advisory Group on Clusters, 2008). Regional officials should take a portfolio perspective on their cluster efforts, addressing the different needs of clusters at different stages of development and leveraging the linkages across clusters. They should leverage the experience of the cluster efforts for economy-wide improvements. And they should integrate their cluster efforts into a broad economic strategy that identifies the specific value the location has relative to others of similar standing.

The third step is to spur the development of new clusters. The evidence discussed indicates that cluster programs work best for strong, established clusters. But the limitations of a cluster policy confined to "strengthening the existing strengths" is obvious for less advanced economies and regions in need of structural change (Ketels & Memedovic, 2008; Landabaso, 2001). Some researchers suggest that diversification efforts can be based on a cluster approach when development paths are designed to leverage existing clusters for a push into related fields (Delgado et al., 2010a; Hausmann & Klinger, 2007). These ideas have informed a discussion about "smart specialisation" which has now been adopted as a central concept guiding regional policy in Europe (Foray, David, & Hall, 2009).

Cluster based strategies – as part of industry, innovation, regional and science policy – should account for both a rejuvenation of established industries in Europe, as well as paving the ground for new emerging industries. The chances of success are clearly improved if such policy initiatives are fact-based, and here we hope that the European Cluster Observatory will play an increasingly important role.

---

[4] http://www.cluster-excellence.eu/quality.html
[5] http://www.clustercompetitiveness.org/

References

Aranguren, M. J., Larrea, M., Navarro, I, (2006). The policy process clusters versus spatial networks in the Basque context. In C. Pitelis, R. Sudgen, & J. Wilson (Eds.), Clusters and globalisation (pp. 258–280). Cheltenham, England: Edward Elgar.

Baldwin, R., Forslid, R., Martin, P. Ottaviano, G., & Robert-Nicoud, F. (2003). *Economic geography and public policy*. Princeton, NJ: Princeton University Press.

Benneworth, P., & Henry, N. (2004). Where is the value added in the cluster approach? Hermeneutic theorising, economic geography and clusters as a multiperspectival approach. *Urban Studies, 41,* 1011–1023.

Brenner, T. (2003). Policy measures to create localised industrial clusters. In T. Brenner & D. Fornahl (Eds.), *Cooperation, networks and institutions on regional innovation systems* (pp. 325–349). Cheltenham, England: Edward Elgar.

Brenner, T. (2008). Cluster dynamics and policy implications. *Zeitschrift für Wirtschaftsgeographie, 52,* 146–162.

Cooke, Philip, A. Eikelpäsch, Ifor Ffowcs-Williams, and Jan Ragner (2007). *Evaluation report by the Vinnväxt International Review Team*, Vinnova Report No. 2007:11, Stockholm: Swedish Governmental Agency for Innovation Systems (VINNOVA).

Delgado, Mercedes, Michael E. Porter, and Scott Stern (2010), Clusters and Entrepreneurship, *Journal of Economic Geography,* Vol. 10, pp. 495 – 518.

Dohse, D., & T. Staehler (2008). *BioRegio, BioProfile and the rise of the German biotech industry*, Kiel Institute Working Paper No. 1456. Kiel Institute for the World Economy, Germany.

Duranton, G. (2011). California dreamin': The feeble case for cluster policies, *Review of Economic Analysis*, 3, 3–45.

Falck, O., S. Heblich, and S. Kipar (2008), *The extension of clusters: Differences-in-difference evidence from the Bavarian state-wide cluster policy*, Jena Economic Research Paper No. 2008-073, Jena, Germany: Friedrich Schiller University, Max Planck Institute of Economics.

Foray, D., David, P. A., & Hall, B. (2009, June). Smart specialisation—The concept. *Knowledge economists policy briefs, Nos. 5–9: Knowledge for growth—Prospects for the knowledge-based economy* (pp. 25–29 [No. 9]).

Greenstone, M., Hornbeck, R., & Enrico Moretti, E. (2010). *Identifying agglomeration spillovers: Evidence from million dollar plants* (MIT Department of Economics Working Paper No. 07-31). Cambridge, MA: Massachusetts Institute of Technology.

Hausmann, R., & Klinger, B. (2007). *The structure of the product space and the evolution of comparative advantage* (CID Working Paper No. 146). Cambridge, MA: Kennedy School of Government.

Ketels, C., & Memedovic, O. (2008). From clusters to cluster-based economic development. *International Journal of Technological Learning, Innovation, and Development, 1,* 375–392.

Ketels, Christian, Göran Lindqvist, and Örjan Sölvell (2006), *Cluster Initiatives in Developing and Transition Economies*, Center for Strategy and Competitiveness: Stockholm.

Kuhn, Johan (2010), *An Analysis of Firm Growth Effects of the Danish Innovation Consortium Scheme*, Danish Research and Innovation Council: Copenhagen.

Landabaso, M. (2001). *Clusters in less prosperous places: Policy options in planning and implementation* (Discussion paper). Brussels: European Commission.

Martin, Philippe, Thierry Mayer, and Florian Mayneris (2011), Public Support to Clusters: A firm level study of French 'Local Productive Systems', *Regional Science and Urban Economics*, Vol. 41, pp. 108–123.

Martin, P., Mayer, T., & Mayneris, F. (2008). *Spatial concentration and firm-level productivity in France* (CEPR Discussion Paper No. 6858). London: Centre for Economic Policy Research.

Martin, R., & Sunley, P. (2003). Deconstructing clusters: Chaotic concept or policy panacea? *Journal of Economic Geography, 3,* 5–35.

Motoyama, Y. (2008). What was new about the cluster theory? *Economic Development Quarterly, 22,* 353–363.

Norman, V., & Venables, A. (2004). Industrial clusters: Equilibrium, welfare and policy. *Economica, 71,* 543–558.

Rodriguez-Clare, A. (2005). *Coordination failures, clusters and microeconomic interventions* (IADB Working Paper No. 544). Washington, DC: Inter-American Development Bank.

Rodriguez-Clare, A. (2007). Clusters and comparative advantage: Implications for industrial policy. *Journal of Development Economics, 82,* 43–57.

Rodrik, D. (2008). *Normalizing industrial policy* (Commission on Growth and Development Working Paper No. 3). Washington, DC: The International Bank for Reconstruction and Development, The World Bank.

Sölvell, Ö., Lindqvist, G., and Ketels, C. (2003), *The Cluster Initiative Greenbook*, Stockholm: Ivory Tower Publishers.

Sölvell, Ö. (2009) *Clusters – Balancing Evolutionary and Constructive Forces*. Stockholm: Ivory Tower Publishers.

Appendix

Reports and Articles Published in Connection with the European Cluster Observatory

2012

European Cluster Observatory (2012). *Mediterranean Observatory Newsletter*, Issue 5, February 2012.

European Cluster Observatory (2012). *Mediterranean Observatory Newsletter* – Issue 6, August 2012.

Giovacchini, Elia, Jasna Sersic (2012). *Industry Transformation Report: Shipbuilding Industry*. 2012.

Ketels, Christian (2012). *Sweden´s Position in the Global Economy*. Stockholm: Entreprenörskapsforum. Globalisation Forum Report No. 2. 2012

Sölvell, Örjan, Göran Lindqvist, Mats Williams (2012). *Innovationer, regioner och kluster*. Stockholm: Entreprenörskapsforum. Näringspolitiskt Forum Report No. 4. 2012.

2011

Barsoumian Sarine, Rossella Riggio, Astrid Severin and Titus van der Spek (2011). *Eco-innovation in cluster organisations in the chemical and textile clothing-leather sectors*

Barsoumian, Sarine, Astrid Severin and Titus van der Spek (2011). *Eco-innovation and national cluster policies in Europe: A qualitative review.*

European Cluster Observatory (2011). *Mediterranean Observatory Newsletter* – Issue 3, January 2011-

European Cluster Observatory (2011). *Mediterranean Observatory Newsletter* – Issue 4, October 2011.

Giovacchini, Elia (2011). *Priority Sector Report: Life Science.*

Lindqvist, Göran, Sergiy Protsiv (2011). *Priority Sector Report: Experience Industries*.

Lindqvist, Göran, Örjan Sölvell (2011). Organising Clusters for Innovation: Lessons from City Regions in Europe. Lyon: CLUSNET Final Report (INTER-REG IV C Project).

Power, Dominic (2011). *Priority Sector Report: Creative and Cultural Industries*. 2011.

2010

Andersson, Niklas, Jan Annerstedt (2010). Clusters in the Mobility Industry: Automotive and Tourism Sectors. Priority Sector Report. 2010.

Aranguren, Mari Jose, Susana Franco, Christian Ketels, Asier Murciego, Mikel Navarro, James R. Wilson (2010). *Benchmarking Regional Competitiveness in the European Cluster Observatory: Methodology Background Paper No. 1.*

European Cluster Observatory (2010). *European Cluster Organisation Directory*. 2010.

European Cluster Observatory (2010). Mediterranean Observatory Newsletter – Issue 1. April 2010.

European Cluster Observatory (2010). *Mediterranean Observatory Newsletter* – Issue 1, September 2010.

European Cluster Observatory (2010). *User Expectation Survey for the Collaboration Platform within the European Cluster Observatory and the European Club of Cluster Managers within the European Cluster Excellence Initiative*.

Lindqvist, Göran (2010). *User Expectation Survey Summary Report: National Agents*.

Lorenz, Usue, James R. Wilson (2010). *User Expectation Survey Summary Report: Regional Agents*.

Power, Dominic, Tobias Nielsén (2010). *Priority Sector Report: Creative and Cultural Industries*.

2009

Ketels, Christian (2009). *Clusters, Cluster Policy, and Swedish Competitiveness*, Expert Report No. 30, Swedish Globalisation Council, Stockholm.

Lindqvist, Göran (2009). *Disentangling Clusters: Agglomeration and Proximity Effects*. Published Doctoral Dissertation. Center for Strategy and Competitiveness, CSC, Stockholm.

European Cluster Observatory and Center for Strategy and Competitiveness, Stockholm (2009). *Priority Sector Report: Knowledge Intensive Business Services (KIBS).*

Sölvell, Örjan (2009). *Clusters: Balancing Evolutionary and Constructive Forces*, Ivory Tower, Stockholm.

2008

EU Commission DG Enterprise (2008). Europe INNOVA/PRO INNO Europe Paper No. 9. *The Concept of Clusters and Cluster Policies and Their Role for Competitiveness: Main Statistical Results and Lessons Learned*. Commission Staff Working Document SEC 2637.

High Level Advisory Group on Clusters (2008). *The European Cluster Memorandum*, Stockholm.

Ketels, Christian, Olga Memedovic (2008). From Clusters to Cluster-Based Economic Development, *International Journal of Technological Learning, Innovation, and Development*, Vol. 1, pp. 375–392.

Lindqvist, Göran, Sergiy Protsiv, Örjan Sölvell (2008). *Cluster strengths and regional innovation*, mimeo. Stockholm School of Economics, Stockholm. 2008.

Oxford Research (2008). Cluster Policy in Europe, Europe Innova Cluster Mapping Project, Oslo.

Sölvell, Örjan, Christian Ketels, Göran Lindqvist (2008). Industrial specialization and regional clusters in the ten new EU member states. *Competitiveness Review*. Vol 18, No. 1/2. pp. 104-130.

2007

EU Commission DG Enterprise (2007). Europe INNOVA/PRO INNO Europe Paper No. 5. *Innovation Cluster in Europe: A Statistical Analysis and Overview of Current Policy Support*.