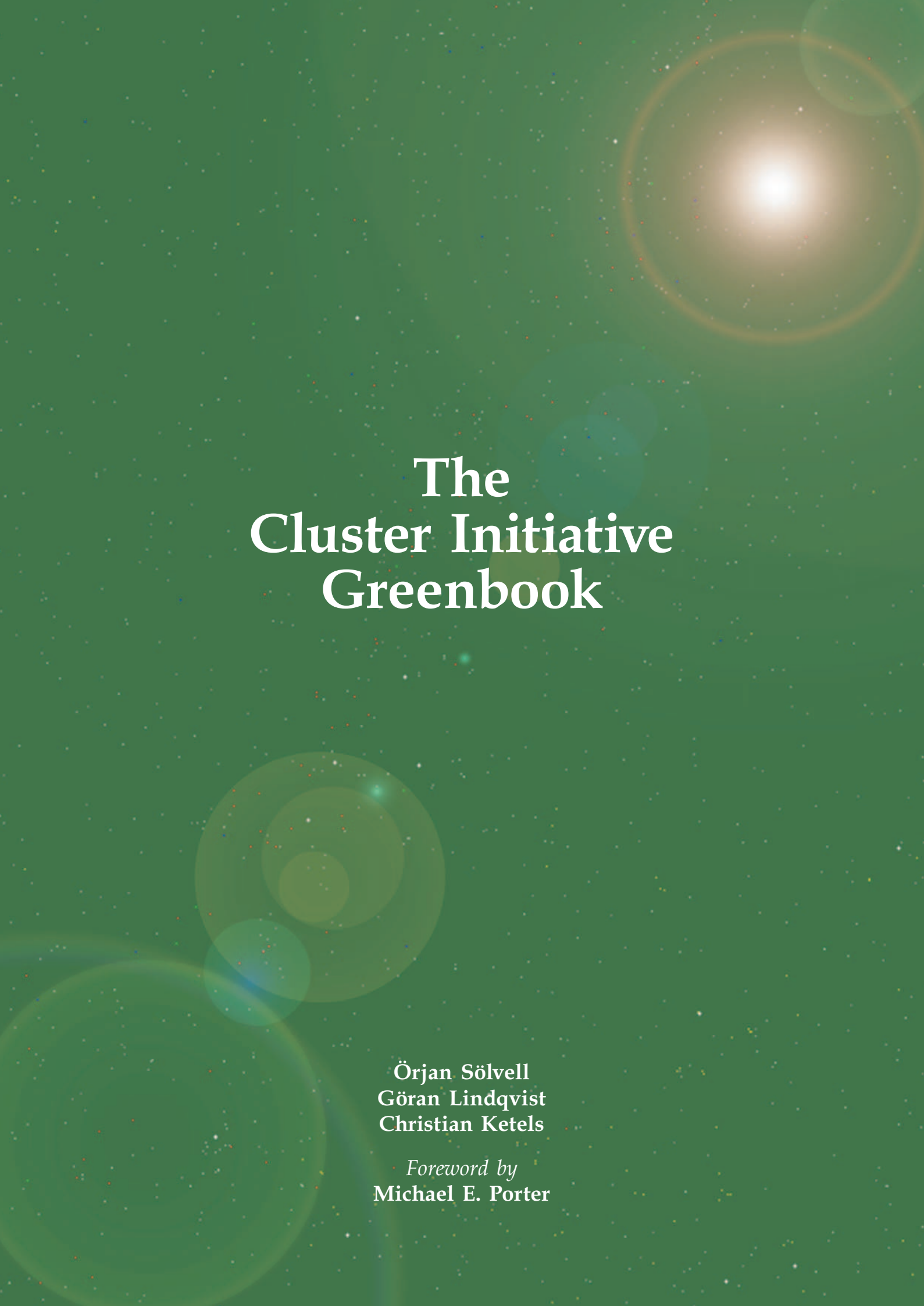




The Cluster Initiative Greenbook

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Foreword by
Michael E. Porter

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The cover depicts the sky as seen from Gothenburg, Sweden at midnight on 18 September 2003 (date and venue of the 2003 TCI Global Conference, where this Greenbook was presented). The view is centered on the constellation Cassiopeia and the stellar object NGC 7789, also known as "Herschel's Spiral Cluster". It is one of the most spectacular so called open clusters, and comprises more than 500 stars.

This cluster was discovered in 1783 by the British astronomer Caroline Lucretia Herschel (1750-1848).

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Örjan Sölvell, Göran Lindqvist, Christian Ketels
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Foreword

by Professor Michael E. Porter

The concept of clusters has emerged as a central idea in competitiveness and economic development over the last decade. Drawing on a long tradition of literature, the reasons for cluster formation and the benefits of clusters for productivity and innovation are becoming better known.¹ A large and growing body of case studies has documented clusters, their characteristics, and their evolution over time.² More recently, efforts to analyze clusters statistically are beginning,³ but are still hampered by data limitations, especially outside the United States.

As the understanding of clusters has grown, clusters have become a prevalent component of national and regional economic development plans. Hundreds of cluster initiatives have been launched involving virtually all region of the world, and the number is growing. These initiatives, which take a wide variety of forms, are now an accepted part of economic development. However, we have surprisingly little systematic knowledge of these initiatives, their structure, and their outcomes. As more and more resources are devoted to efforts to foster cluster development, the need to understand best practices has become urgent.

This Cluster Initiative Greenbook is a pioneering effort to fill this gap. It assembles, for the first time, survey evidence on a large sample of cluster initiatives. This data allows an analysis of the different shapes of cluster initiatives, how they evolve over time, and some of the factors that appear to influence their success and failure. While data limitations preclude definitive findings regarding the performance of cluster initiatives, then, the Greenbook provides much helpful and suggestive evidence. It also contains more in-depth descriptions of some aspects of cluster initiatives that experience reveals to be important to success.

Having participated in many dozens of cluster initiatives since the publication of *The Competitive Advantage of Nations* in 1990, the findings and suggestions here ring true. While we still have much to learn about translating the concept of clusters into practice, this volume takes us a big step forward.

Boston, August 2003

Michael E. Porter

¹ For a literature survey and summary of the theory, see M.E. Porter, "Clusters and Competition: New Agendas for Companies, Governments, and Institutions" in *On Competition*, Boston: Harvard Business School Press (1998).

² See the bibliography of cluster profiles by Claas van der Linde available at <http://data.isc.hbs.edu/cp/index.jsp>

³ See M.E. Porter, The Economic Performance of Regions, *Regional Studies*, pp. 549-478, Vol. 37. 6&7, 2003.

Acknowledgements

This Greenbook, the result of a joint initiative by Emiliano Duch, Vice-President of TCI, Lars Eklund, Director of the Innovation Division at VINNOVA, and the three authors, was presented at the 6th Global TCI Conference held in Gothenburg, Sweden in September 2003. The purpose of this first-of-a-kind Greenbook was to give the conference participants a summary of current practises in organising and implementing cluster initiatives around the world, and to provide policymakers, business leaders and others involved in cluster initiatives a first-hand look at key drivers of success.

We would like to thank all the people who made this report possible. First, we are grateful to all the cluster facilitators around the world who took their time to help us document their cluster initiatives through interviews and through our Global Cluster Initiative Survey. Further, we would like to thank all the people involved in the book project: Erik von Bahr (VINNOVA), Mateja Dermastia (Slovenian Ministry of Economy), Emiliano Duch (TCI), Dr Lars Eklund (VINNOVA), Arne Eriksson, Dr Maria Lindqvist (Nationellt program för utveckling av innovationssystem och kluster), Dr Anders Malmberg (CIND, Uppsala University), and Ifor Ffowcs-Williams (TCI).

We would also like to thank Martin Sebesta, who carried out most of the research identifying cluster initiatives for the survey, and conducted many of the case interviews.

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Örjan Sölvell

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Executive summary

Cluster initiatives (CIs) are organised efforts to increase growth and competitiveness of clusters within a region, involving cluster firms, government and/or the research community. CIs have become a central feature in improving growth and competitiveness of clusters. Inspired by the works of Professor Michael E. Porter, government leaders, industry leaders and academic leaders now create new forms of partnerships in all parts of the world.

This Greenbook on cluster initiatives is the first of its kind, presenting data from over 250 CIs around the world, based on the Global Cluster Initiative Survey 2003 and a series of case studies. The book describes and analyses CIs in great detail: In what settings do they evolve? What objectives do they pursue? What does the CI process look like? And what are the drivers of good performance?

The Greenbook offers a new model – the Cluster Initiative Performance Model (CIPM) – which can be used to analyse and evaluate CIs. Chapter 2 provides an outline of CIPM. Descriptive data and analyses are presented in Chapters 3–5, and Chapters 6–7 presents a selection of CI cases.

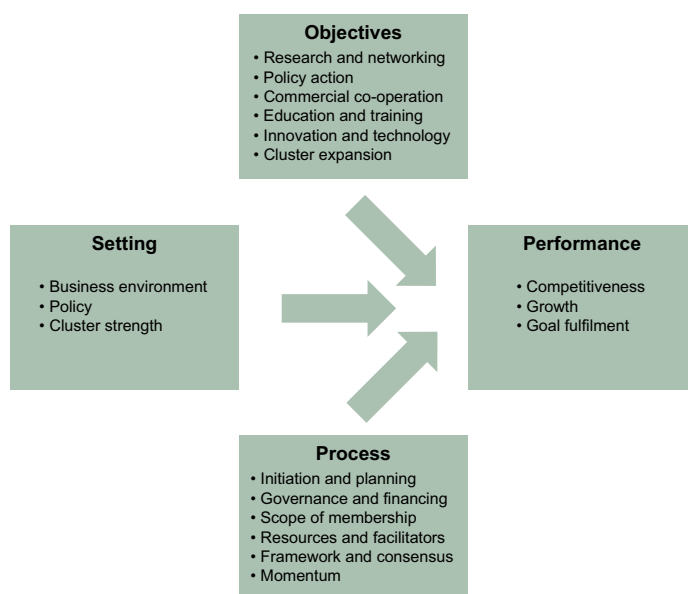


Figure 1
The Cluster Initiative
Performance Model

The Cluster Initiative Performance Model (CIPM)

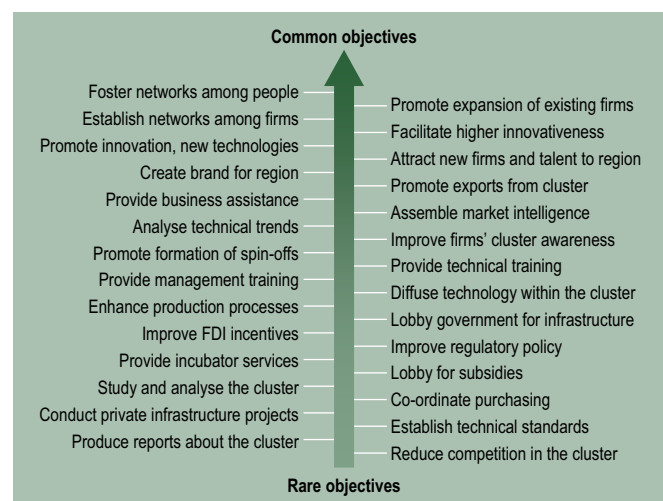
The Cluster Initiative Performance Model (CIPM) is based on four components: three drivers – the social, political and economic setting within the nation; the objectives of the cluster initiative; the process by which the cluster initiative develops – affecting the performance of the CI. Each of the four components comprises several factors.

The Global Cluster Initiative Survey (GCIS)

The GCIS 2003 identified more than 500 cluster initiatives around the world, primarily in Europe, North America, New Zealand and Australia. 238 completed the on-line survey, representing a broad range of technology areas. The survey covered all the four components of CIPM. Some of the findings include:

- Every CI is unique. The setting varies from developed to transition and developing countries, from prosperous to weak regions, and from strong to weak clusters. Furthermore, the range of objectives vary, as does the process by which CIs are initiated, financed and organised. However, some ways of choosing objectives and organising the process leads to better performance.
- CIs are most frequent in developed economies and transition economies. CIs tend to focus on technology intensive areas. Most CIs are found in: IT, medical devices, production technology, communications equipment, biopharmaceuticals, and automotive. Most CIs active in 2003 were initiated 1999 or later (72%) .
- Most CIs are found in national environments where science and innovation promotion is an important part of government policy, and where local government plays an important role.
- CIs occur in clusters that often are of national importance and almost always of regional importance.
- The objective of the CI can vary greatly. Some objectives are pursued by most CIs, while others only by a few CIs (see Figure 2 below).
- Some 25 objectives can be grouped in six segments, as shown in the Cluster Initiative Target Board (see Figure 3 on next page).
- CIs tend to be broad, on average covering four to five of the six segments. This holds true both for young and old CIs. If anything, older CIs tend to be somewhat more narrowly focused than younger CIs.
- CIs are initiated by government (32%), by industry (27%), or equally by both (35%).
- Financing comes primarily from government (54%), from industry (18%) or equally from both (25%).
- Companies are the most influential parties in the governance of CIs.
- Only in rare cases does the government initially pick the members of the CI.
- CIs tend to have a narrow geographical focus. (50% have most of their members within one hour's travel distance.) CIs typically have a broad membership and rarely exclude foreign owned companies, competitors, or small companies.

Figure 2
Cluster initiative objectives
Listed in order of frequency
Source: GCIS 2003



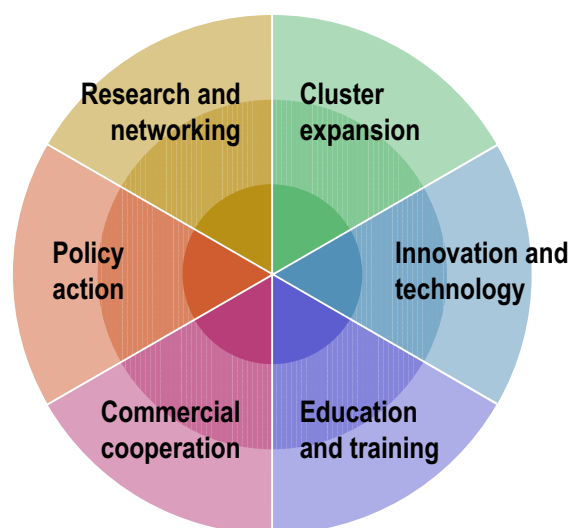
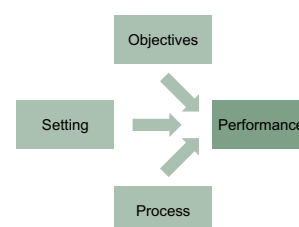


Figure 3
The Cluster Initiative Target Board

- Almost all CIs (89%) have a dedicated facilitator, and many (68%) have some sort of office. Cluster facilitators tend to have an industry background from the cluster.
- Many (78%) spend time and efforts to build a framework of shared ideas about why the CI is beneficial and how it is supposed to work. This framework is usually (87%) based on an evaluation of the cluster's own strength and capabilities, and more rarely (36%) is an international blueprint adopted. CIs tend to have an explicitly formulated vision (84%), but less (68%) also have quantified targets for their activities. 83% reach some level of consensus about what activities to perform.
- 95% of CIs have ten active members or more. 40% depend for their future success on one key individual.

Characteristics of successful CIs

- 85% agree that the CI has improved the competitiveness of the cluster, and 89% have helped the cluster grow. Overall, 81% of CIs have met their goals, while only 4% have been disappointing and not led to much change.
- The national social, political and economic setting within which CIs are implemented is important for the performance. Key factors include a high level of company trust in government initiatives and having influential local government decision makers, which are both clearly related to good CI performance.
- CIs serving strong cluster of national and regional importance are more successful.
- CIs initiated through a competition process to get government financing perform significantly better in terms of increasing international competitiveness. CIs for clusters in areas designated by government as attractive perform significantly better in attracting new firms.
- There is no effect on performance if government picks the companies to involve in the CI. Nor do CIs with members within one hour's travel distance, in a single level of the value chain, or avoiding direct competitors or small companies perform better. CIs limited to domestic companies perform worse.
- CIs with offices and budgets sufficient to conduct significant projects without seeking separate funding perform better. For promoting cluster growth, establishing an exchange with other clusters in the same industry is beneficial.
- For the facilitator, having a broad network of contacts is the most important success factor, but the facilitator's qualities are more importance for competitiveness performance than for growth performance.



- CIs that build a clear, explicit framework, based on the cluster's own strengths, and spend time to share this framework with all parties, are clearly more successful in promoting cluster competitiveness.
- Generally disappointing results and failure for CIs to generate changes are related to poor consensus, weak frameworks, facilitators lacking strong networks, lack of offices and sufficient budgets, and neglected brand building. Disappointing CIs tend to be aimed at less important clusters.
- Government policy and other setting factors also influences performance indirectly, by affecting the objectives CIs pursue and process issues. For example, in countries where local government decision makers are important, CIs tend to pay more attention to various competitiveness-related objectives, such as promoting new technology and monitoring technical trends.

A closer look at four aspects of cluster initiatives

How CIs evolve

CIs have their own lifecycles which is separate from the cluster lifecycle. (See Figure 4 on next page.) The CI can be initiated in the early phases of the cluster lifecycle, but more often is added as a “turbo charger” in later stages. Some of the more important empirical observations include the following:

- The evolution of CIs is highly dependent upon the legacy before the official launch of the CI. Emergence from industry-led projects create problems with government commitment, and vice-versa, government-led projects tend to stifle commitment from industry once the CI is set up.
- CIs are often initiated by a single “clusterpreneur,” with leadership later to be taken over by a hired facilitator.
- CIs are often set up as a response to a new government initiative (government-led) or a crisis (industry-led).
- It takes time to build up momentum for the CI, typically more than three years.
- Mature CIs build up structures, establish an office but there is no sign of significant increases in budget size.
- Financing changes over time with government seed money playing a lead role in the first phase. In later stages government money seems to decrease as a general rule, with membership fees becoming more important. Thus, surviving CIs move from a project-based organisation to a more membership-based organisation.
- There is no obvious “path” where CIs move from simple to complex, or from a narrow to a broad set of objectives. Both old and new CIs have a broad range. However, commercial cooperation plays a less important role in later stages, and incubators increase over time.
- Older CIs perform better (partly as a result of survival bias in the data).
- We would expect that, over time, many CIs will turn into cluster-based institutions for collaboration (IFCs).

How the cluster shapes the CI

- The nature of the cluster plays an important role in shaping the objectives and the process of the CI.
- Regionally and nationally important clusters are more likely to engage in activities that are most likely to promote cluster growth, such as spin-off promotion, attracting firms to the cluster, brand building and infrastructure projects. Similarly, such clusters are more involved in objectives that are important for improving the clus-

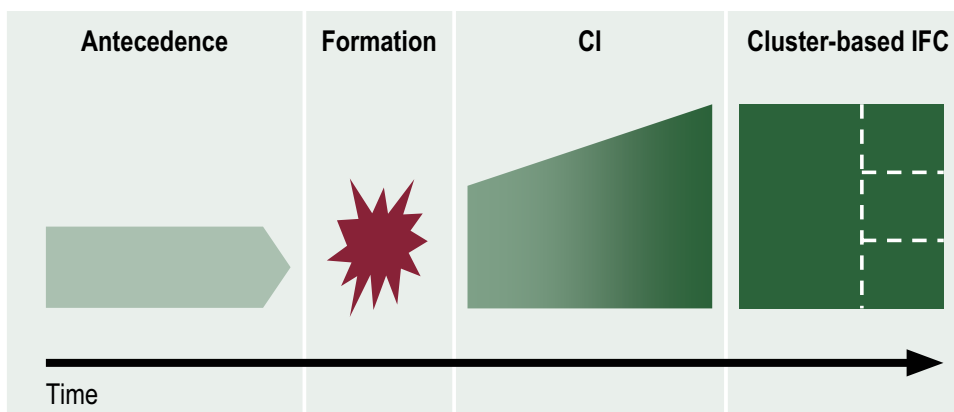


Figure 4
The cluster initiative lifecycle

ter's competitiveness, such as promoting innovativeness and new technologies, technical training, and, again, brand building.

- Important clusters have CIs with higher budgets, are more likely to have an office and an explicit vision, their facilitators have better networks of contacts, and they are less prone to exclude foreign-owned companies. All these factors are important for success.

Building on experience

- In countries where CIs are an established way of organising industrial policies, CIs are more likely to formulate an explicit vision and achieve consensus about what activities to perform, which has a great impact on success.

The well-funded CI

- CIs with a budget sufficient to carry out significant project without separate funding perform better in terms of goal fulfilment. They are better in promoting cluster growth, and somewhat better in improving competitiveness.
- The well-funded CIs are more likely to pursue certain objectives, including spin-off promotion, technical training, and infrastructure projects.

CIs in a transition economy: the case of Slovenia

The case of Slovenia illustrates several factors that are particularly challenging in transitional economies:

- Trust in government initiatives is low, and there is little experience in industry collaboration to build on.
- Clusters are often weak, lacking domestic rivalry and foreign investments.
- General knowledge of clusters and cluster initiatives is poor and there is a lack of expertise needed to communicate the concepts. This makes it difficult to build common frameworks for CIs.
- There are several obstacles to entrepreneurship, including bureaucracy and lack of venture capital.
- The government's long-term commitment in CIs can be questioned if CI programmes are not supported by other microeconomic policies, such as education policies or FDI policies.

Cluster initiatives for a new era

Cluster initiatives are an increasingly common means to strengthen and develop clusters. And CIs are perceived to have a positive impact; more than 80% of our survey

respondents state that the CI has improved the competitiveness of their cluster. The discussion has shifted from whether a cluster initiative is useful to how it should be done. But while CIs hold a lot of promise the data also shows signs of fragility in many cluster initiatives. We have identified three key challenges CIs face: setting objectives and monitoring performance, organising the CI process over time, and integrating the CI in a broader microeconomic policy agenda.

Setting objectives and monitoring performance

Cluster initiatives are defined by their purpose, upgrading a cluster's competitiveness, not by the types of policy tools used. For competitiveness, everything matters! CIs tend to work in two-thirds of the objectives included in the Cluster Target Board. Each CI needs to make a unique decision on which objectives to pursue. This decision should be based on a systematic analysis of the regional clusters profile, using a conceptual framework accepted by all cluster participants.

Monitoring the impact of CIs is increasingly critical to sustain the commitment of cluster participants. This is a complex task, because many effects of the CI on cluster competitiveness will take a long time to materialise and will depend on other external factors as well. CIs need to develop an indicator system that documents their activities on different levels and becomes an integral part of tracking the cluster's performance over time.

Organising the CI process over time

Cluster Initiatives go through different stages in their institutional development that create changing demands on cluster participants and CI staff. CIs never start at zero; there is always a history of the cluster and often of previous attempts to organise it. Once the CI is started, two transitions between different stages are critical: First, the analysis – action divide, moving from setting objectives to implementing solutions, requires a massive shift in the participation of cluster members. Second, as the CI is coming to age, the initial project structure needs to evolve into a more permanent institutional form, an institution for collaboration (IFC), to keep the sustained momentum required.

CIs reflect a new model to organise economic policy as a collaborative effort of different branches of the government, the private sector, universities, trade associations, and others. Openness to all involved parties is, in fact, critical for the success of a CI. Collective action of this new type requires new attitudes of all parties, and is facilitated by strong individuals, CI facilitators or “clusterpreneurs,” at the centre.

Integrating the CI in a broader microeconomic policy agenda

CIs focus on upgrading the cluster-specific elements of a regional business environment. These efforts will be much more effective, if they occur in the context of other CIs and the upgrading of business environment areas affecting many clusters. In such a regional microeconomic policy agenda, all clusters with the ability and willingness to improve can become the object of a CI.

Cluster initiatives have come a long way from their ad-hoc beginnings in the 1980s and 1990s. To further increase their impact, CI practitioners have to find the approach that both builds on the international experience and reflects their unique local environment. This Greenbook aims to give them, for the first time, more systematic guidance and data in making these choices.

Introduction

The Greenbook project

Cluster initiatives (CIs) are organised efforts to increase the growth and competitiveness of clusters within a region, involving cluster firms, government and/or the research community. CIs have become a central feature of microeconomic policy in the last decade, linking to industrial policies, regional policies, SME policies, FDI attraction, and research and innovation policies. Experimentation is occurring in all corners of the world. Some nations and regions began in the 1980s and 1990s, while others are just beginning now. CIs are initiated from industry leaders, government and academia.

CIs are now commonplace not only in the most advanced economies, but also in transition economies and developing economies. International organisations (such as the EU, UNIDO, USAID, OECD, the World Bank, etc.) are becoming more involved in cluster work, and CIs are becoming a tool not only for the more advanced regions but also for less developed regions within nations. After a decade of experience, it is now time to take stock and determine the state-of-the-art in the area of cluster initiatives.

This Greenbook reports on some 260 CIs, creating a rich picture of cluster initiatives: What are their objectives? How are they organised? How are they financed? In what national and regional settings are they emerging? How do cluster initiatives evolve over time? What drives good or bad performance? These are some of the key questions addressed in this report.

The report is intended to be read by industry leaders, cluster practitioners, policy-makers, consultants and other people involved in improving the competitiveness of regions and nations through cluster initiatives.

The role of cluster initiatives in modern economic policy

Today, cluster initiatives are a central part of industrial, regional and innovation policy-making across the developed world. Cluster initiatives have come to play an important role in rejuvenating ailing clusters and regions and in promoting the emergence of new science-based industries. Often CIs blend in with earlier policy initiatives, but in certain cases new policy institutions have been created.

Even if CIs tend to be highly customised to fit the local or national policy tradition, there are some common elements underpinning the new policy agenda:

- an increased focus on the microeconomic business environment as opposed to a traditional macro focus
- a long-term agenda to improve competitiveness of clusters rather than individual firms or broad sectors
- an emphasis on regional and local areas

- improved networking among cluster firms, trust-building and enhanced dialogue to create spill-overs
- the provision of seed money rather than large subsidies
- a balanced input of resources from government and industry
- a selection of clusters through a process of competition, implying a weaker form of winner-picking
- a mix of competition and cooperation as underlying drivers of learning and innovation
- a mix of SMEs and large firms participating
- partnerships across the “triple helix,” involving not only cluster firms and government, but also the academic community
- learning and innovation based on a systems-view rather than on isolated firms

The content and objectives of cluster initiatives vary greatly from information gathering and dissemination, cluster analyses, networking, lobbying, export promotion, regional attractiveness and branding, to innovation and cluster growth. In a study of 34 European cluster initiatives, the most common objectives (in order) consisted of: government relations, training, R&D, and joint marketing and regional branding (Isaksen & Hauge 2002).

Cluster initiatives tend to evolve over time and thus they are more of a process than a fixed tool or well-defined end product. There is general agreement that cluster initiatives must be highly sensitive to local circumstances. Not only must cluster initiative activities be adapted to the local resource base, but the organisation and implementation of the cluster initiative itself must also build on local political and industry traditions (this is line with recent reasoning in Raines 2002 and Isaksen & Hauge 2002). International benchmarks play a role in shaping the CI process, but in order for a CI to have significant impact it must be tailored to the situation at hand. Even at the level of descriptive language and political branding of initiatives, one can see large differences across countries. Some countries are leaning more towards technology and innovation policy (centres of expertise in Finland, Vinnväxt in Sweden), whereas others build on regional foundations (Flanders cluster policy), SMEs (SPLs in France), networks (Kompetenznetze.de in Germany) or more commercial foundations (clusters of competence in Denmark).

Strangely, one of the most important clusters in the world, Silicon Valley, where CIs have been almost absent, has become a metaphor or role model for CIs around the world, including Motorsport Valley in the U.K., Arve Technic Valley and the Paris Optics Valley in France, Flanders multimedia Valley and DSP Valley (microelectronics) in Belgium, Dommel Valley in the Netherlands, Materials Valley in the Rhein-Main area of Germany, Strängnäs Biotech Valley and Dalarna Crystal Valley (displays) in Sweden, and Medicon Valley in the Öresund area around Copenhagen and Malmö-Lund. Among the new EU members, CIs using the Valley metaphor include Plastics Valley in Poland and Sunrise Valley (lasers) in Lithuania. In the U.S., the Photonic Valley is located in the northeastern Massachusetts.

Cluster initiatives have developed as a new policy agenda, most often as an outgrowth from traditional policy areas such as regional policies, innovation policies and industry policy. Sometimes it is simply a re-labelling of traditional policy measures, but in more and more countries the new micro-focused agenda is setting the pace for a new policy paradigm – often contradicting the old paradigm built on subsidies and “help” with static competitiveness based on cost.

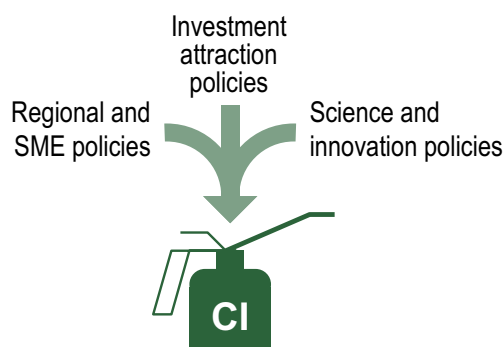


Figure 5
CIs build on three main policy areas

CIs (see Figure 5 above) are emerging within three distinct policy fields: 1) regional, industry and SME policies, 2) FDI attraction policies, and 3) science, research and innovation policies. On the regional side, CIs are implemented to boost development in weak regions and to rejuvenate declining clusters. Through CIs focus is shifting from cost cutting (subsidies, tax incentives, etc.) to promoting innovation and upgrading through new partnerships (Landabaso, 2002). FDI attraction policies have also shifted their focus from attracting individual firms and production units to a region or country, to involving clusters and more embedded investments. The third policy field where CIs have made an inroad is science, research and innovation policies. The tendency here is to focus on science-driven industries. In fact, a majority of CIs in the world (see further Chapter 3) are serving research intensive clusters.

The CI lifecycle

Just as clusters have lifecycles, cluster initiatives have lifecycles – in terms both of the degree of institutionalisation and the objectives of the initiative. (See Figure 6 below.) The need for frequent dialogue among industry, policymakers and other constituents has no obvious ending point. On the other hand, public financing and initiation activities have a beginning and an end.

As important as the evolution of the CI is the legacy, or antecedence, of the CI. Antecedence can involve earlier industry initiatives, such as lobbying activities, or earlier policy initiatives, such as regional or innovation policies. Established organisations – e.g. networks, industry associations or other institutions for collaboration (IFCs), etc. – often have a great impact on the formation of CIs.

After a formation period (with initiative coming from industry, government or in rare cases academia), the official CI is launched. Unless the CI fails, it will build up a stronger resource base over time and stronger commitment from the partners. Some CIs become even more institutionalised (typically financed through membership fees), which turns the initiative into a formal cluster-based institution for collaboration.

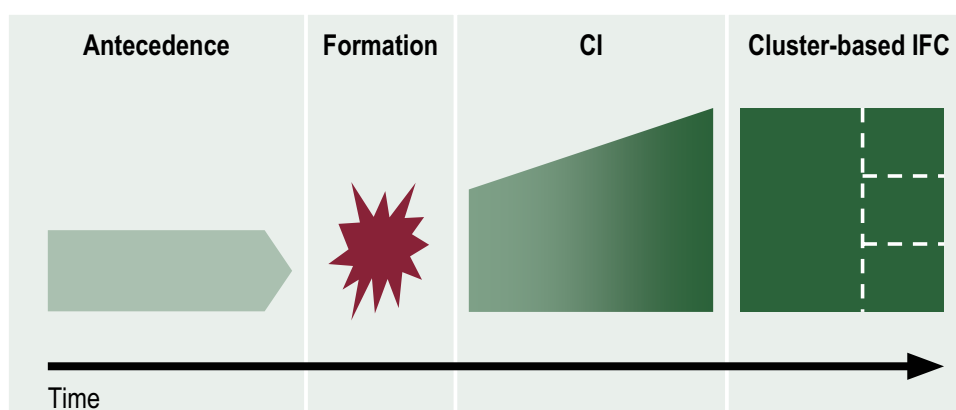
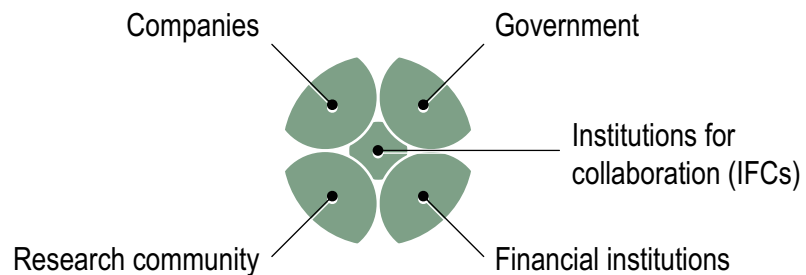


Figure 6
The cluster initiative lifecycle

Figure 7
Five sets of actors composing a cluster



Clusters

Clusters consist of co-located and linked industries, government, academia, finance and institutions for collaboration. (See Figure 7 above.)

Dynamic clusters are critical for a successful microeconomic business environment. Imagine flying over a continent at an altitude of 10,000 meters. Clusters will tend to look very similar, with offices, factories, physical infrastructure, educational facilities, etc. However, if we magnify the picture we see large differences across clusters in different nations. Some clusters are more static – producing the “Trabants” of the world (the family car produced in former East Germany), whereas others are more dynamic – producing the “Audis” of the world (a company with pre-World War II roots from the same company as Trabant, Autounion). Human, financial and physical resources in one setting produce world-class cars, whereas in another setting the output is much less impressive.

Dynamic cluster environments are typically characterised by:

- Intense local rivalry involving battles of prestige and “feuds,” stimulating continuous upgrading and change and creating a foundation for a more advanced and diverse supplier base.
- Dynamic competition emanating from the entry of new firms, including spin-offs from larger incumbents.
- Intense cooperation organised through various institutions for collaboration such as professional organisations, chambers of commerce, cluster organisations, etc. Clusters also exhibit intense informal interaction based on personal networks.

Agglomeration of economic activity

Adapted from Malmberg, Sölvell and Zander (1986)

Traditionally, agglomeration theory has evolved in response to three sets of empirical observations. The first is that a large proportion of total world output is being produced in a limited number of highly concentrated industrial core regions. The second observation is that firms in related industries tend to co-locate and thus form clusters. A third observation is that both these phenomena tend to be persistent over time as these agglomerations become institutionalised. Once in place, the agglomerative process tends to be cumulative. In more recent scholarly work another empirical observation has come to the forefront: certain agglomerations tend to produce superior innovative outputs.

The three sets of observations – regional concentration, spatial clustering and path dependence – have been described and analysed in some detail by numerous writers, from Marshall (1890/1916) and Weber (1909/1929) through Hoover (1948),

Myrdal (1957), and Lloyd & Dicken (1977), to Porter (1990, 1998), Krugman (1991) and Enright (1998), to mention a few.

A distinction can be made among different types of agglomeration economies. One type relates to general economies of regional and urban concentration that apply to all firms and industries in a single location (urbanisation economies), representing those external economies passed on to firms as a result of saving from the large-scale operations of the agglomeration as a whole. These are the forces leading to the emergence of industrial core regions, manufacturing belts and metropolitan regions. A second type is the specific economies that relate to firms engaged in similar or inter-linked activities, leading to the emergence of industrial districts (localisation economies). Such districts constitute a base for flexible production systems that can meet volatile markets (Piore & Sabel 1984). In both cases, agglomeration economies have their roots in processes whereby linkages among firms, institutions and infrastructures within a geographic area give ➔

- Access to increasingly specialised and advanced factors of production (human capital, financial capital, infrastructure) and for certain clusters, linkages with universities and public/private research institutes.
- Linkages to related industries, sharing pools of talent and new technological advancements.
- Proximity to sophisticated and demanding buyers.

Tendencies towards cluster formation around cities or in smaller regions have long been evident in both traditional and handicraft industries, service industries and science-based industries. Historically, natural factors such as climate and soil, location of raw materials, and endowments in terms of energy (forests, waterfalls, etc.) and transportation routes (rivers, natural ports, etc.) have played an important role in the location of industries and whole clusters. Pure acts of entrepreneurship or chance have also come into play, such as in the much-cited case of carpet manufacturing in Dalton, Georgia. Access to specialised skills and advanced markets has been a decisive factor for patterns of economic agglomeration in service industries such as financial services in London and on Wall Street, fashion in Paris, auction houses in London and advertising offices on Madison Avenue. Clustering is a general phenomenon across nations, but agglomeration of industrial activity on a global scale, such as in the case of Hollywood or Silicon Valley, is most pronounced in science-based industries such as pharmaceuticals, biotechnology, telecommunications, consumer electronics, computers and IT.

It is a well-established fact that firms active in strong clusters and regions with strong clusters perform better. Most important, clusters offer a fertile ground for innovation and upgrading of competitive advantage by firms. There are at least three critical arguments as to why innovation and upgrading tend to be connected with clusters:

- the need for incremental reduction of technical and economic uncertainty,
- the need for repeated and continuous interaction between related firms and specialised institutions (including research and education), and
- the need for face-to-face contact in the exchange and creation of new knowledge.

➡ rise to economies of scale and scope; the development of general labour markets and pools of specialised skills; enhanced interaction between local suppliers and customers; shared infrastructure; and other localised externalities. Agglomeration economies are believed to arise when such links either lower the costs or increase the revenues (or both) of the firms taking part in the local exchange. Presence in an agglomeration is, in other words, held to improve performance by reducing the costs of transactions for both tangibles and intangibles. In Scott's view (Scott 1983; 1988) the formation of regionalised industrial systems will be particularly intense where linkages tend to be small-scale, unstable and unpredictable, and hence subject to high transaction costs.

The traditional accounts of the agglomeration phenomenon are predominantly static where increased efficiency of the transactions of goods and services give rise to benefits for firms located in agglomerations. This strong focus on the efficiency and intensity of local transactions is somewhat paradoxical, since the much-theorised linkages among agglomer-

ated firms has proven to be weak. In today's global economy, a large proportion of firms have few or no trading links with other local firms within the same cluster, even when there is a strong spatial clustering of a particular industrial sector. Still, spatial clustering may well play an important role without any significant local input-output relationships. Sustained competitiveness has more to do with capabilities leading to dynamic improvement than with achieving static efficiency (Porter 1990; 1994). Clusters are not just fixed flows of goods and services but rather dynamic arrangements based on knowledge creation and innovation in a broad sense. In line with this new view, more recent research approaches have come to focus on the importance of innovation when trying to explain the emergence and sustainability of agglomerations. Thus, clusters are made up not only of physical flows of inputs and outputs, but also by intense exchange of business information, know-how, and technological expertise, both in traded and un-traded forms. While Porter's main concern has been the existence and reproduction of clusters of tech- ➡

The first characteristic derives from the fact that innovative processes are fundamentally uncertain in terms of technical feasibility and market acceptance. Only a few projects result in commercial successes. Even if the level of uncertainty varies with industry and type of innovation, technical aspects are commonly worked out by means of trial and error testing and modification. Incremental and trial-and-error problem solving in turn lead to a need for continuous interaction, both in informal networks and through formal cooperation. The two other arguments build on the notion that proximity within clusters adds tremendously to continuity and daily face-to-face interaction in personal networks that is critical to transferring more tacit skills. Communication is facilitated by common language (including professional language) and training. Finally, innovative sources are often found outside the firm, where nearby customers, competitors and various institutions play important roles.

Promising clusters are not primarily characterised by advantages of scale but rather by a capacity for perpetual innovation and upgrading of goods and services, and by a process of increasing specialisation and upgrading of human capital and other factors. Leading clusters are characterised by an “upward spiral” where incumbent firms gain from, and add to, local spill-overs. However, spill-over effects have to be created; they do not just arise automatically because industries are co-located in a region. The degree to which interaction takes place resulting in spill-overs depends on the legacy of a region, social capital and policy choice, including cluster initiatives.

The general and microeconomic business environments

Michael E. Porter’s seminal work – *The Competitive Advantage of Nations* – created a new vision for economic development and competitiveness. In sharp contrast to traditional economic remedies related to the macroeconomic climate of individual nations – including a favourable exchange rate, positive balance of trade and a low inflation rate, Michael Porter puts focus on the microeconomic agenda (sometimes labelled “micro-competitiveness” or “microeconomics of competitiveness”).

Resources, including human resources, capital or physical assets can be deployed in ways that enhance productivity – involving both elements of efficiency and innovation – and hence prosperity, or in ways that will lead to waste. In the wasteful scenario,

➤ nologically related firms, there are corresponding attempts to analyse the learning abilities and creativity of regional and urban agglomerations of the general type. Instead of specialisation and spatial clustering of related industries, emphasis is placed on the presence of a regional variety of skills and competencies, where the – often unplanned – interaction among different actors leads to new and often unexpected ideas. (Andersson, 1985, and Florida, 2002). Malecki (1991) reviews several studies that, in much the same vein, define the properties of an entrepreneurial region. (Johannisson, 1987.)

In Figure 8, the agglomeration phenomenon is defined along two dimensions: agglomeration forces operating at the general level or at the level of related firms and industries on the one hand, and forces increasing static efficiency and flexibility or improvement and innovation on the other.

	Economic activity in general	Technologically related industries
Efficiency (scale) and flexibility	Metropolises	Industrial districts
Innovation and upgrading	Creative regions	Clusters

Figure 8
Different types of economic agglomerations
Source: Malmberg, Sölvell, Zander (1986)

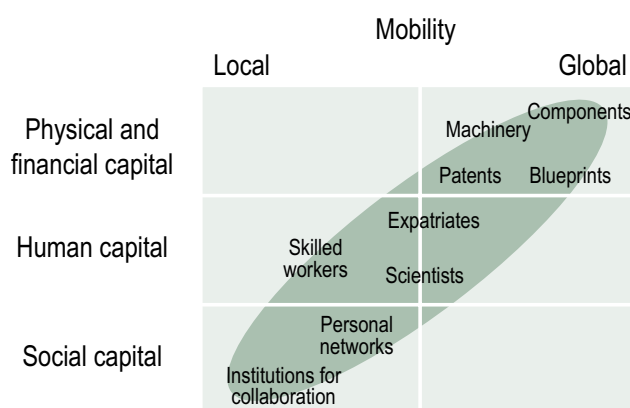


Figure 9
Three types of capital and their mobility

resources tend to be static. On the other hand, in the right business environment, resources and capabilities tend to upgrade in a mutually reinforcing process. As Michael Porter has shown, cluster dynamics play a crucial role in this process. Despite the alleged homogenising effects of globalisation, countries, regions and metropolitan areas continue to exhibit dramatic differences in terms of specialisation, competitiveness and industrial dynamics. Successful industries and industry clusters in a country or region often retain their leading edge over extended periods of time, despite attempts by others to imitate their success. Sustainable competitive advantage is not created from the global flows of goods, services or capital accessible to everyone, but in the combination of internal and external resources residing in the national and local business environment where strategic decisions are made and entrepreneurial activity is formed. Whereas some technologies and skills move across the globe, others are spatially sticky. Standard components and machinery can be purchased by anyone, anywhere, while the latest technology is often being fine-tuned through interaction between firms and institutions in local clusters. In the local business environment, people share a common culture, speak the same language and develop networks based on trust. Even the most modern forms of communication technology are inferior to face-to-face contact between people when it comes to communicating non-codified types of information. While physical capital (digitised information, components, machinery, etc.) and to some extent human capital travel the world, social capital is embedded in local cultures and institutions (see Figure 9 above).

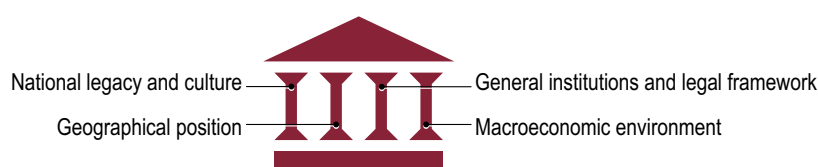
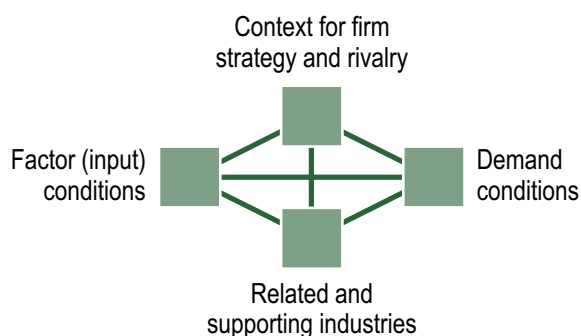


Figure 10
The general business environment within the nation

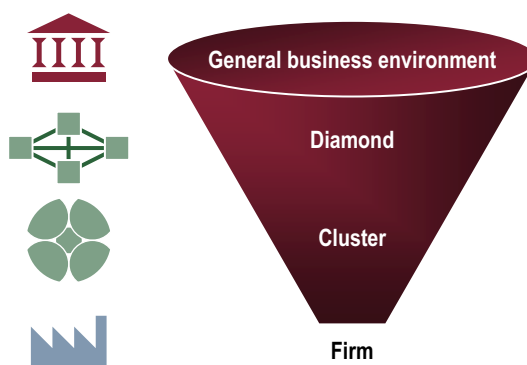
The general business environment within a nation (see Figure 10 above), within which firms are shaped, consists of four pillars: national legacy and culture; geographical position; general institutions and legal framework; and the macroeconomic environment. In addition to the general business environment, the microeconomic business environment – as represented by Michael Porter’s diamond model (see Figure 11 on next page) – plays a critical role in driving innovation and the upgrading of competitive advantage by a nation’s firms.

Figure 11
The microeconomic business environment – the diamond
Source: Porter (1990)



More dynamic diamonds involve a process of factor and infrastructure upgrading and specialisation, sophisticated demand, intense rivalry and cluster dynamics. Dynamic diamonds act as “engines” of cluster growth and innovation. Thus, the national environment in which firms emerge and develop, consists of three levels: the cluster, the microeconomic business environment (the diamond), and the general business environment. (See Figure 12 below.)

Figure 12
The firm and its environment – the Funnel Model



Static and dynamic clusters

Within a nation, the microeconomic “engines” vary in terms of their strength and dynamism. The stronger ones tend to lead to internationally competitive firms whereas the weaker ones – with less horsepower – tend to produce only locally competitive firms.

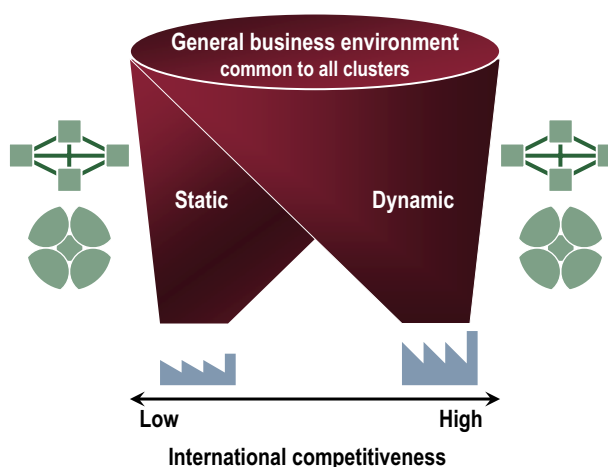


Figure 13
Static and dynamic clusters

Policy and the business environment

The general business environment, see Figure 14, imposes certain almost deterministic forces from history, geographical position, and culturally-bound institutions (1). Policy choices on the other hand, offer opportunities for citizens to shape the future of their society. On the economic side, macroeconomic policy (2) influences the general business environment, and microeconomic policies (3) – including cluster initiatives, which serve to “lubricate” the microeconomic “engine” – directly influence the diamond and clusters. Strategies formed within firms and entrepreneurial activities (4) are other proactive forces shaping clusters and society.

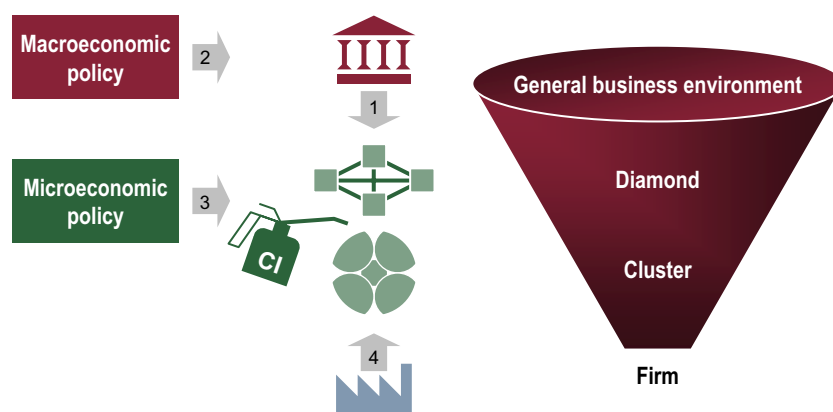


Figure 14
The business environment and forces of change

The role of historic and geographic determinism can, for example, be seen in the aftermath of the fall of the Soviet Union. Many transition countries in Eastern Europe were advanced societies in the beginning of the 20th century, including Estonia, Poland, Hungary and other nations. Some nations have only been prosperous in certain regions, such as Moscow and St Petersburg in Russia. Others were late industrialisers and have a less advanced legacy, including Bulgaria and Romania. Geographical determinism is seen in Estonia’s proximity to Finland and the Nordic region, which gave the country a head start in the 1990s. The same goes for Slovenia, with its historic ties to Western Europe. Overall, proximity to Western Europe has been one of the stronger predictors of economic growth after 1990 in Eastern and Central Europe.

Successful clusters are linked to global markets

Firms are shaped by the national business environment, but are also linked to the global marketplace in various ways. In most industries today, global markets offer a way for firms to enhance efficiency through improved economies of scale in varying parts of the value chain: sourcing of materials, components, machinery and services, low-cost manufacturing, and access to larger markets. Depending on homogeneity of demand, trade restrictions, transportation costs and homogenisation of technology, global sales can involve more or less local adaptation and design and more or less dispersion of packaging, assembly, testing, and production. The more a firm faces one homogenous market, with few or no trade barriers, and the lower the transportation costs, the more one global source for development and production can be used. However, in many industries some fragmenting forces still prevail, forcing multinational corporations to run dispersed operations, often reducing some of the potential global scale advantages.

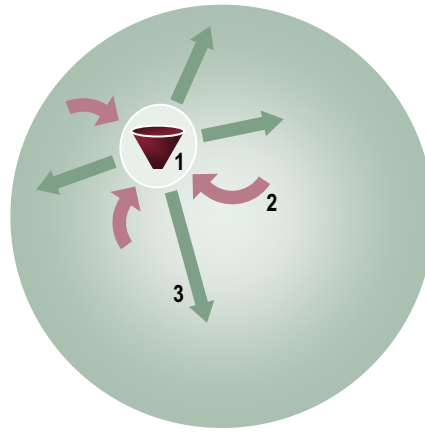


Figure 15
Local clusters and the global marketplace

In addition to enhanced economies of scale, global markets are used to gain access to pools of standardised low-cost labour (e.g. software engineers or export platforms in emerging markets), codified technology (through licensing and other agreements), financial capital, and other tradable resources. Through trade shows, travel and scanning operations, the global market can be selectively tapped. Key technologies and skills are often not traded globally for competitive reasons and cannot be easily drawn on from afar due to their embeddedness and tacit nature.

Firms in clusters have access to specialised and advanced factors of production. The process of factor upgrading is, in fact, endogenously driven by competition and sophisticated demand inside the cluster. In addition to these local conditions, free and substantial mobility between the cluster and the world around it are vitally important if the local environment is to avoid stagnation. To achieve vitality in the long term, local clusters need to be able to attract companies, venture capital, skills and other resources from all over the world, what we term the “Greta Garbo-effect”. Greta Gustafsson was the young Swedish actress who was attracted to Hollywood, the leading film cluster, where she later became world famous as Garbo. Firms inside a cluster must also have sufficient access to world markets to be able to sustain their efficiency and competitiveness. Thus, (see Figure 15) a dynamic cluster is characterised by three distinct dynamics: local dynamism (1), global attractiveness (2), and global market reach (3). Since leading clusters are characterised by high costs (wages, land, etc.), they run contrary to static competitiveness, but are nevertheless critical for sustained innovation and upgrading of firms and resources.

The Cluster Initiative Performance Model

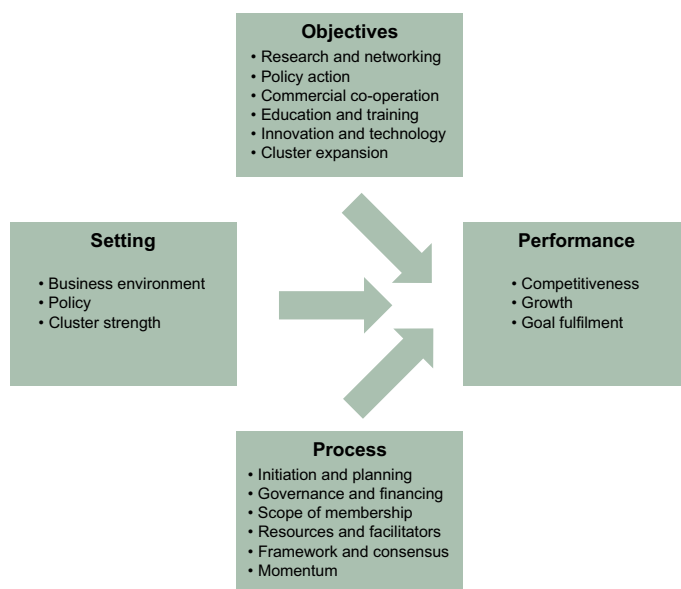


Figure 16
The Cluster Initiative
Performance Model (CIPM)

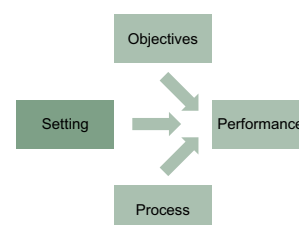
In order to understand and analyse CIs in greater detail, a new model has been developed – the Cluster Initiative Performance Model (CIPM). It is based on four components: three drivers – 1) the social, political and economic setting within the nation; 2) the objectives of the cluster initiative; 3) the process by which the cluster initiative develops— affecting 4) the performance of the CI. Each of the four components comprises several factors (see Figure 16 above).

The social, political and economic setting

Cluster initiatives, involving partnerships among cluster firms, government authorities and the research community, evolved as a new phenomenon in many developed nations during the 1990s. In some nations, notably Italy, such partnerships emerged already in the 1970s. Partnerships were formed both to help the process of establishing new clusters and also to rejuvenate old and often ailing clusters. CIs have also become a new policy tool in transition and developing countries. The national social and economic settings in which CIs develop vary greatly across countries. Furthermore, the setting also varies within nations (the strength of clusters, role of regional policies, etc.).

Business environment

Differences in the national and local setting have important implications for how the CI process evolves, how CIs are organised and financed, the role of government, etc. The business environment also has direct implications for the performance of the CI. To capture these differences in background settings, the CI performance model addresses



the level of social capital in society and the overall strength of the microeconomic environment, i.e. the national diamond.

Policy

CI have in some cases emerged out of, and have often complemented, traditional policy areas such as industry policies, regional policies, SME policies, and innovation policies. The CI performance model covers a range of policies, including innovation, competition, environmental regulation and overall stability and predictability. It also covers whether decision-making is made at the national, regional or local level. Furthermore, governmental attitudes towards clusters and cluster initiatives are tested.

Cluster strength

The CI performance model covers the strength of the cluster for which the CI was set up to serve. Dimensions include: cluster history, degree of competition, strength of buyers and suppliers, degree of competitiveness, level of technology, and how important the cluster is within the nation and region.

Many cluster initiatives are connected to high-tech fields such as biotechnology, telecommunications and IT, and the number of “Valleys” around the world is increasing every day. Other initiatives target more traditional clusters such as textiles, food, tourism and wood products. Some CIs are closely connected with research and innovation policy initiatives, including research laboratories and science parks.

The Rotterdam audiovisual/film cluster initiative was built on an emerging cluster supporting a yearly film festival in Rotterdam. In the 1990s, the film industry began to merge with the multimedia industry, creating a new field, audiovisual/film, which includes traditional film, TV, animations, web applications, and almost everything that speaks “to the eye and the ear.” The CI helped increase the inflow of film and multimedia companies, mainly to the Lloydquarter district where the CI had developed specialised infrastructure. In 2001, the cluster had grown to some 350 firms. There is some academic support, mostly from the Rotterdam College of Higher Education.

Other CIs build on old clusters. The Rhein-Main area has been home to a large number of materials companies (advanced usage and modifications of metals, etc.) for about 200 years. Traditionally, the Rhein River valley has been a ‘chemicals’ area, and the Main River valley a ‘metals’ area. In this area, which is roughly a 100 km radius circle around the intersection of the two valleys, a combined materials cluster can be delimited. There are 150-200 companies in the cluster, covering the whole value chain, including several large global companies. Also, there are several famous German universities and research institutes supporting the companies in the region. The main catalyst for setting up a CI was two major companies in the area moving some of their key functions to other locations. These events both led to a loss of image for the region and to a loss of talented people and important jobs. The CI was initiated in February 2002 by a group of academic leaders. From the start, the CI was designed to improve networks across firms and across industry and universities, and to improve the image of the region. The government was not involved.

CIs can help restructuring old clusters and facilitating a process of closing down some firms, while upgrading others. In the case of the textile cluster in Emilia-Romagna, the CI is involved both in downsizing and in improving value activities in fashion, marketing and quality certification.



Figure 17
Cluster initiative objectives
Listed in order of frequency
Source: GCIS 2003

Objectives of the CI

Cluster initiatives involve a number of objectives, some of which are common and others are rare, as shown in Figure 17 above.

Based on a statistical analysis, these objectives can be classified into six main segments:

- Research and networking
- Policy action
- Commercial cooperation
- Education and training
- Innovation and technology
- Cluster expansion

Some CIs only cover a narrow set of objectives whereas others cover up to all six segments. The range of CIs can be depicted in a target board (See Figure 18 below.)

Research and networking

Many CIs involve information gathering, publishing cluster reports, sharing information through seminars, inviting speakers, creating websites, etc. Related to this is the

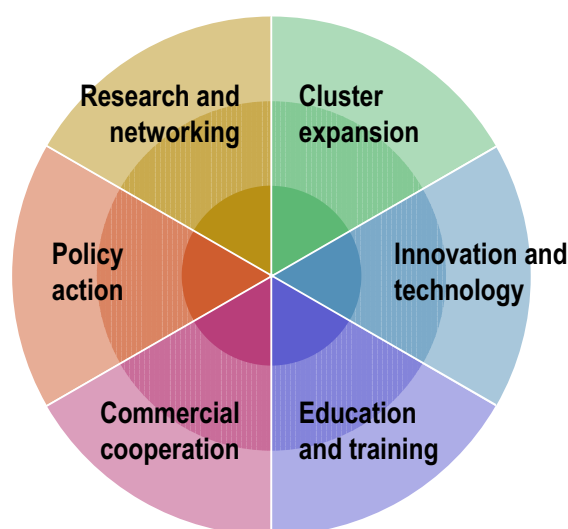
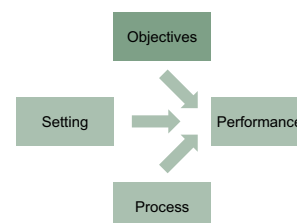


Figure 18
The Cluster Initiative Target Board

creation of new networks within the cluster. In the case of the Vlaams software platform in Flanders, Belgium (established in 1999), the CI focuses on seminars, short courses and maintaining an extranet for information sharing among a limited set of firms and organisations.

Networking is a central aspect of most CIs. Our data shows that this is, in fact, the most common objective. Sometimes these networks are more general and sometimes they are more targeted. The CITI initiative for South African IT firms, for example, partly aims to facilitate networking between large and small firms.

Policy action

Lobbying and creating dialogue among industry, the scientific community and government authorities belong to another important group of objectives. The Öresund IT Academy (covering the Öresund area between Copenhagen, Denmark and Malmö-Lund, Sweden) was partly set up to reduce administrative obstacles in order to facilitate the integration of IT clusters across the Öresund Strait.

Commercial cooperation

Commercial cooperation involves a number of objectives, such as joint purchasing, business assistance, market intelligence, and export promotion. In 1998, the Austrian government initiated a concerted effort to improve Austrian exports using cluster initiatives. The project was organised by the Ministry of Finance and the Ministry of Economy, which provided funds for the state-owned Austrian Chamber of Commerce, which in turn managed the establishment of CIs. One of several clusters set up this way was the Austrian Food Cluster. The main objective of the CI was to promote Austrian food exports by pooling marketing and sales resources and adding public financial support. Activities included representing the cluster at trade fairs, performing market research for potential export markets, and lobbying government to maintain financing for the CI. The market research was supplied to CI members in the form of a comprehensive market report.

Education and training

Education and training involves both workforce training and management education. The Aerospace Components Manufacturers CI in Connecticut started with workforce training, only later moving into manufacturing practices, purchasing partnerships and international marketing. Traditionally, SME-based clusters in northern Italy have developed local CIs centred on technical training and support.

Innovation and technology

CIs can be set up to facilitate improved innovation processes and enhance technology. This involves following technical trends, setting technical standards, diffusing new technology and improving production processes.

Cluster expansion

Many CIs are set up to promote a certain region by enhancing its “brand image” and actively promoting inward investment (FDI). The CITI initiative in the Western Cape province of South Africa was set up to improve the image of the area as an IT region. In the case of the Pannon Automotive Cluster (PANAC) in Hungary, the mission was to attract multinational corporations to relocate to Hungary and encourage them to build tight supplier relationships with the Hungarian supplier base. Cluster expansion also involves incubator services and the promotion of spin-off firms.

The CI process

A cluster initiative has an antecedence, or legacy, and once initiated, it evolves.

The origins of a CI might relate back to a project, an IFC or another industry organisation. Sometimes a purely government-driven program evolves into a CI. In other cases cluster participants have set up joint activities and the CI is formed when government moves in. This was the case with the Aerospace Components Manufacturers (ACM) CI in Connecticut where a new state cluster development program was launched in 1999 and ACM was selected as one of the CIs. It is also the case in many European nations that industry partnerships were later selected and financed by governmental authorities. The Norwegian aluminium cluster, for example, set up an education project, which was later chosen as a CI (Lettmetall/TOTAL) and a new range of objectives developed.

To get a deeper understanding of how CIs are set up and evolve, our model focuses on six dimensions:

- Initiation and planning
- Governance and financing
- Scope of membership
- Resources and facilitator
- Framework and consensus
- Momentum

Initiation and planning

Cluster initiatives begin in different ways. Often there is one person who takes the lead – a “clusterpreneur.” He or she typically has a background in the cluster. If the initiative comes from government, it is often part of a process where organisations at different levels (national, regional, local) are involved. In both the cases of Mat fra Trøndelag (food cluster initiative in the Trondheim region) and Lettmetall/TOTAL (aluminium cluster initiative in the Raufoss region) in Norway, a regional policy organisation took the lead, since clusters were not being considered at the national policy level. In the food cluster initiative, where there was no history of an industry initiative, it took quite some time for industry participants to commit to the project. The opposite was experienced in the Fuel Cells Canada case where industry took the lead role and had difficulties involving government.

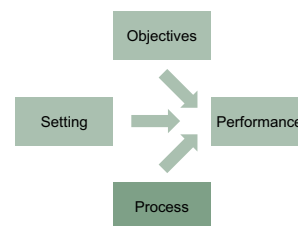
In the Medilink East initiative around Cambridge-Essex (medical instruments), the initiative came from one industry leader who decided to franchise the Medilink concept from the Yorkshire-Humberside region.

Governance and financing

CIs are governed in various ways. Some CIs are more government-driven and others more industry-driven. Furthermore, local and regional government can be more or less involved. In many developing and transition economies international organisations play a role. Some CIs move from government and industry seed money to membership fees as the main source of financing. There seems to be a general tendency of membership fees being a more common source of financing in the U.S. than in Europe or elsewhere.

Scope of membership

The scope of a CI defines who can be a member of the initiative. Scope relates both to geographic area, stage in the value chain (competitor, supplier, customer), domestic



versus foreign firms, and size of the company. For example, the Aerospace Components Manufacturers (ACM) CI in Connecticut was directed only towards SMEs supplying OEMs. The Austria Food Cluster initiative did not allow direct competitors to join.

Resources and facilitator

Almost all CIs have access to some organisational resources, including a facilitator, office and a website. Often a board of directors oversees the CI, involving representatives from the different constituencies. The level of resources varies greatly. Over time, some CIs manage to grow through fees from increased membership. Facilitators have different backgrounds (industry insider, civil servant, consultant, etc.)

Framework and consensus

CIs can build their own framework or use a blueprint brought in through consultants or via a franchise. Furthermore, a CI can spend more or less effort analysing its own cluster and building commitment among involved parties. Some CIs have a clearly stated vision and formulated (quantifiable) goals, whereas these are unclear in other cases.

Building consensus in the early phase of a CI takes large efforts. But this is also true later in the process when a CI needs to change its focus. Cluster-based policies in northern Italy are now shifting towards a more science-based approach, where linkages to universities and research facilities have become more critical. Cluster initiatives are in a process of change to reflect the move from a skill-based society to a knowledge-based society, and from a local market-based system to a global market-based system. The textile cluster in Emilia-Romagna is in the middle of this process. The region has experienced difficulties and delays in moving from the old CI model with a strong consensus to the new one, where some participants have strongly defended the established model while others have promoted change.

Momentum

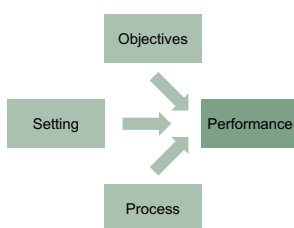
A critical element of a CI is to build momentum. This part of the model tests whether the CI has reached enough momentum to survive changes in policy. It also controls for how many firms in the cluster are members and how much the CI depends on a single individual.

Performance

The performance of CIs is measured along three key dimensions:

- innovation and international competitiveness
- cluster growth
- goal fulfilment

The first measure involves improvements in international competitiveness, ties between industry and research, and emergence of new technologies. Growth involves both internal growth, such as new firm formation, and external growth, such as attracting new firms. Finally, goal fulfilment takes into account the degree to which goals and deadlines have been met and the degree to which the CI and its activities are known to its members.



The Global Cluster Initiative Survey

Many studies about cluster initiatives have been published in recent years. They are usually based on a single initiative, or a small group of cluster initiatives in a single industry or a single geographic area. These studies can provide valuable insights into how CIs operate and why they succeed or fail. However, until now no attempt has been made to make a more comprehensive study of a large number of CIs with a global scope and across a wide range of industries.

This Greenbook is an attempt to do such a comprehensive study. The purpose is to describe how CIs operate today and to explore possible success factors. To do this, a global survey of CIs has been carried out, the first of its kind.

Although a large number of CIs have responded to the survey, they represent just a small part of all the CIs in the world. Nevertheless, we believe this extensive collection of data gives us a good possibility to test hypotheses and draw conclusions.

This chapter is the descriptive part, which tries to paint a comprehensive picture of CIs – how they are set up, who finances them, how they operate, how they perform, and other aspects. The next two chapters present the analysis of how these aspects relate to each other. Chapter 4 deals with direct effects on performance and Chapter 5 with more complex patterns.

About the 2003 survey

This section presents a brief overview of the GCIS 2003. For further details, see the box “How the survey was carried out.”

Participation

The following definition of CIs was established.

Definition of cluster initiatives

Cluster initiative: an organised effort to increase the growth and competitiveness of a cluster within a region, involving cluster firms, government and/or the research community.

Using this definition we identified 509 cluster initiatives across the world and sent invitations to participate in an on-line survey. 233 completed and 5 mostly completed replies were received.

The survey

The on-line survey included 30 questions and 169 sub-questions. Most questions were in the form of a statement and respondents were asked to grade the extent to which they agreed, measured on a seven-degree Likert scale, ranging from “disagree completely” to “agree completely.” (See Figure 19 on next page.)

If you would like to participate in future editions of the Global Cluster Initiative Survey, please register at the survey website: www.cluster-research.org/GCIS

Figure 19
A screen from the on-line survey
Source: GCIS 2003

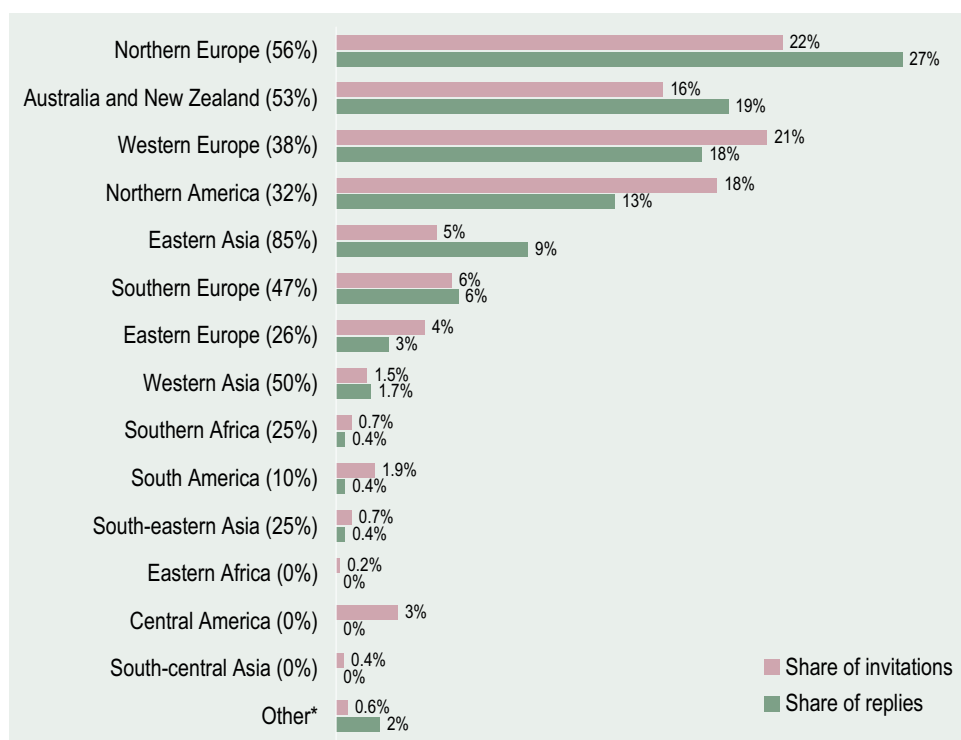
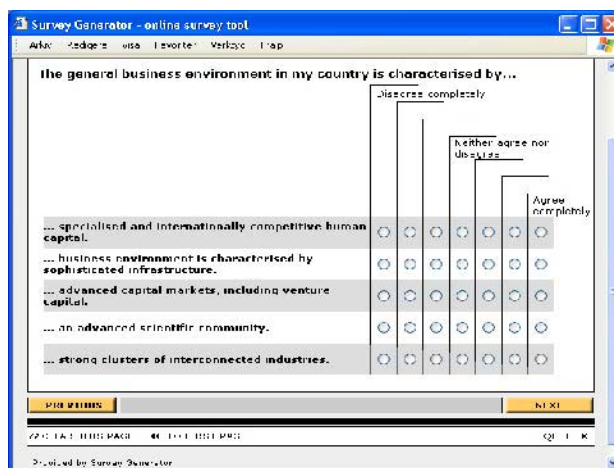


Figure 20
Geographic breakdown of
survey respondents
Source: GCIS 2003

How the survey was carried out

Cluster initiative or not?

Our definition of a CI implies that both companies and at least one more part of the industry-government-university “triple helix” must be involved to constitute a CI. It is this aspect which is central in our definition, not the form of the collaboration. Some have their own office and their own website; some not.

Sometimes *cluster initiatives* refer to themselves with the term “cluster.” However, in this Greenbook, *cluster* signifies the firms and organisations served by the cluster initiative.

In most cases it is easy to see that an organisation qualifies as a CI. In other cases it becomes a matter of drawing the line

between CIs and research consortia or industry associations. For example, an organisation like the Finnish Forest Industries Federation is not a CI. It does play an important role in the Finnish forest cluster, but it only represents one part of the triple helix industry-government-research community.

Identifying CIs

There are many lists of CIs, but they typically cover only a limited geographic area. This means that no one knows how many CIs there are in the world and where they are.

To distribute the survey, CIs were identified through an extensive research process involving two main sources. One source was requests sent out to a broad range of individuals involved in cluster related work: TCI members, researchers, and government staff. Several hundred such requests

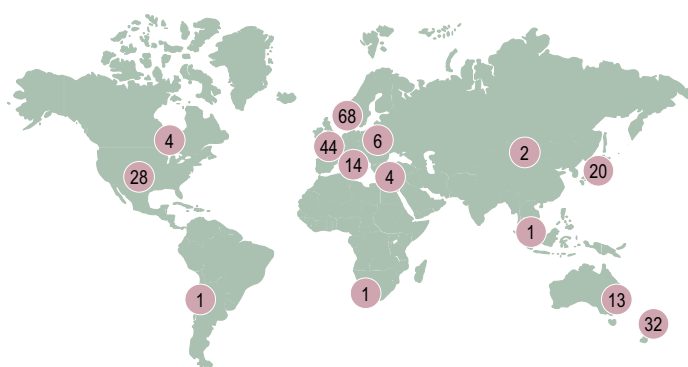


Figure 21

Geographic breakdown of respondents

Number of respondents per country or (for Europe and Western Asia) region as in Figure 20

Source: GCIS 2003

Demography and response rates

Geographically, the respondents are concentrated in Europe, North America, New Zealand, Australia, and Japan. (See Figures 20 and 21.) This is the result of these regions receiving the largest number of invitations, which in turn is partly the result of cluster initiatives most frequently occurring in these regions. However, as noted in the box below, Asia and South America are clearly under-represented, possibly because of language issues.

The overall response rate was surprisingly high, 47%, but this number varied considerably across regions. Northern Europe, Australia and New Zealand, and Japan had an above average response rate, increasing their share of the respondents further, whereas Western Europe, North America and Central America had below average response rates.

Number of responding CIs per country

New Zealand	32	Sweden	11	Canada	4
United States	28	Germany	10	Norway	4
United Kingdom	25	Belgium	8	Cyprus	2
Japan	20	Denmark	8	Estonia	2
Australia	13	France	5	Mongolia	2
Austria	13	Hungary	5	Turkey	2
Spain	13	Netherlands	5	Other *	10
Finland	11	Cross-border	5		

Table 1

Number of CIs per country

Source: GCIS 2003

* Chile, Iceland, Ireland, Italy, Latvia, Lithuania, Malaysia, Poland, South Africa and Switzerland each have one respondent.

☛ were sent out by e-mail to individuals on all continents. The other source was our own primary research using the internet, cluster related reports and other publications.

The process resulted in a list of 509 identified cluster initiatives. This constitutes just a fraction of all CIs in the world, but it is probably one of the more comprehensive lists of CIs currently in existence.

Distributing the survey

The 509 cluster initiatives were sent an e-mail inviting them to participate in the survey. The invitation was written in English and contained a link to an on-line survey in English. Respondents could fill in a part of survey and return later to fill in the rest. They could also go back and review and update their responses. Those who filled in the whole survey in a

single session took on average 31 minutes to complete the survey. The replies were supplied from 28 March to 23 April.

Sample bias

The sample of respondents contains several clear biases. First, CIs in Northern Europe are clearly over-represented since the research was conducted by Swedish staff having better access to information from this area. Second, CIs in areas with high Internet penetration are over-represented, because e-mail and the Internet were used as key search tools. Third, CIs in English speaking countries are over-represented, since the research was carried out by persons speaking English as their first foreign language and all correspondence was in English. This could explain, for example, why so few CIs in Latin America were identified.

The respondents are spread across many technology areas. “High-tech” clusters like IT, communication, medical technology and biopharmaceuticals are well represented, but there are also “low-tech” clusters like entertainment, furniture, processed food and textiles.

Number of responding CIs per technology area

Information Technology	51	Heavy Machinery	11
Medical Devices	35	Power Gen. and Transmission	11
Production Technology	32	Build. Fixtures, Equip., Services	10
Communications Equipment	31	Hospitality and Tourism	10
Biopharmaceuticals	30	Forest Products	8
Automotive	27	Publishing and Printing	8
Analytical Instr., Contr. Equip.	24	Textiles	8
Metal Manufacturing	24	Financial Services	7
Lighting and Electrical Equip.	22	Oil and Gas Products and Services	6
Aerospace Vehicles, Defence	18	Apparel	5
Plastics	18	Distribution Services	5
Construction Materials	17	Fishing and Fishing Products	5
Entertainment	16	Heavy Construction Services	5
Transportation and Logistics	15	Footwear	4
Furniture	13	Jewellery and Precious Metals	3
Processed Food	13	Sporting, Recr. and Child. Goods	3
Business Services	12	Leather Products	2
Aerospace Engines	11	Tobacco	0
Chemical Products	11	Other	70

Table 2
Number of CIs per technology area
Respondents could indicate more than one sector. On average, respondents indicated 2.5 sectors.
Source: GCIS 2003

In terms of age, 40% of the respondents represent CIs initiated in 2001 or later, and 72% in 1999 or later (see Figure 22). We believe this reflects the increased importance of CIs as a tool for economic development in recent years.

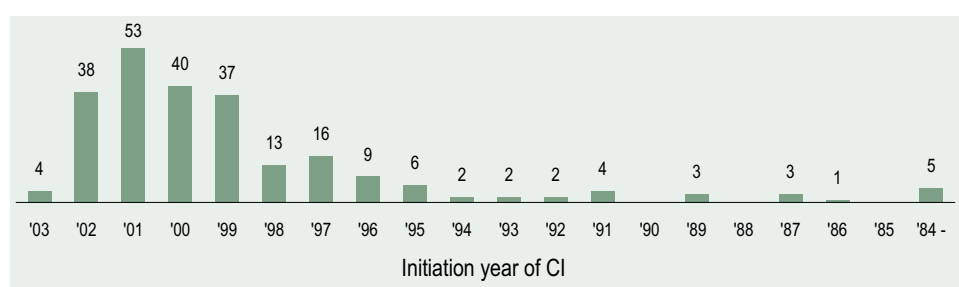


Figure 22
Initiation year of CI
Source: GCIS 2003

Structure of the survey

The structure of the survey was based on the Cluster Initiative Performance Model (CIPM) and the results are presented below according to this model. First data about the social, political and economic setting are given, followed by information about CI objectives, the process, and finally the performance of the responding CIs.

Setting

The environments where CIs occur vary considerably, but there are some strong recurring themes.

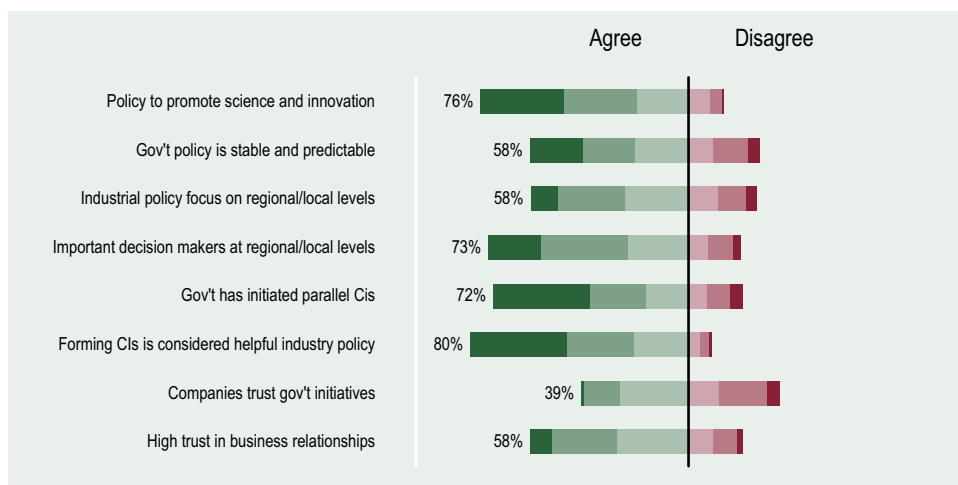


Figure 23

Cluster initiative setting

Dark green represents "Agree completely" and lighter greens lower levels of agreement. Dark red represents "Disagree completely" and lighter reds lower levels of disagreement. (See Figure 19.) The answer "Neither agree nor disagree" is not represented in the graph. Source: GCIS 2003

National policy often has a science and innovation promotion component. Not everyone agrees though, that policy is stable and predictable, and there are also various degrees of decentralisation. In some countries industrial policy focuses more on the national level than on the regional or local level. This variation in decentralisation is also reflected in how important local government decision-makers are considered to be.

In many countries, cluster initiatives are an established and respected part of the industrial policy and often groups of CIs are launched in parallel.

The cultural setting also varies. Particularly interesting are aspects associated with social capital and trust. The trust companies have in government initiatives varies considerably from country to country. (See Figure 23.)

The cluster served

Although this survey covered cluster *initiatives*, each such initiative is aimed at a cluster or, in rare cases, several clusters.

The survey shows that cluster initiatives are primarily set up in comparatively strong clusters. The clusters served by the cluster initiatives are typically considered to be more

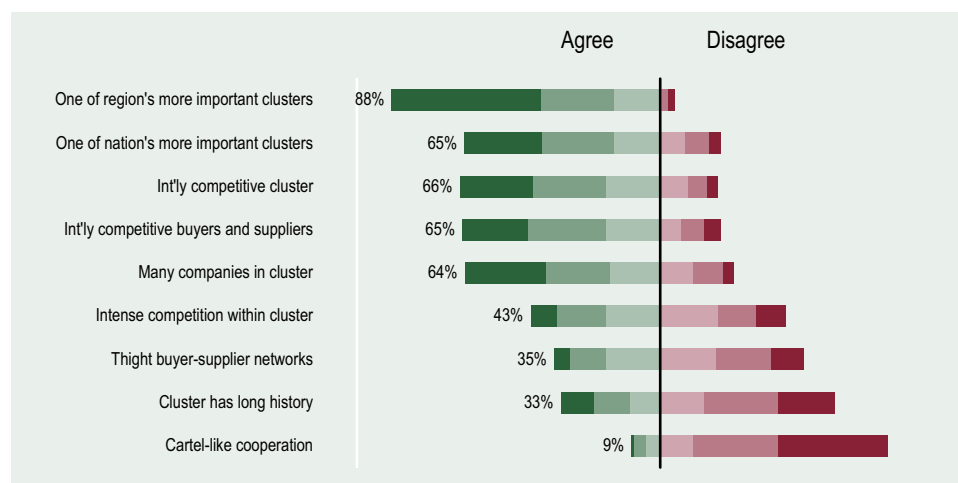
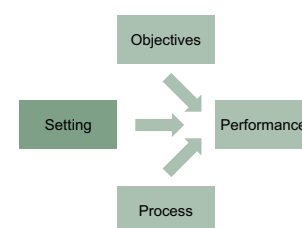


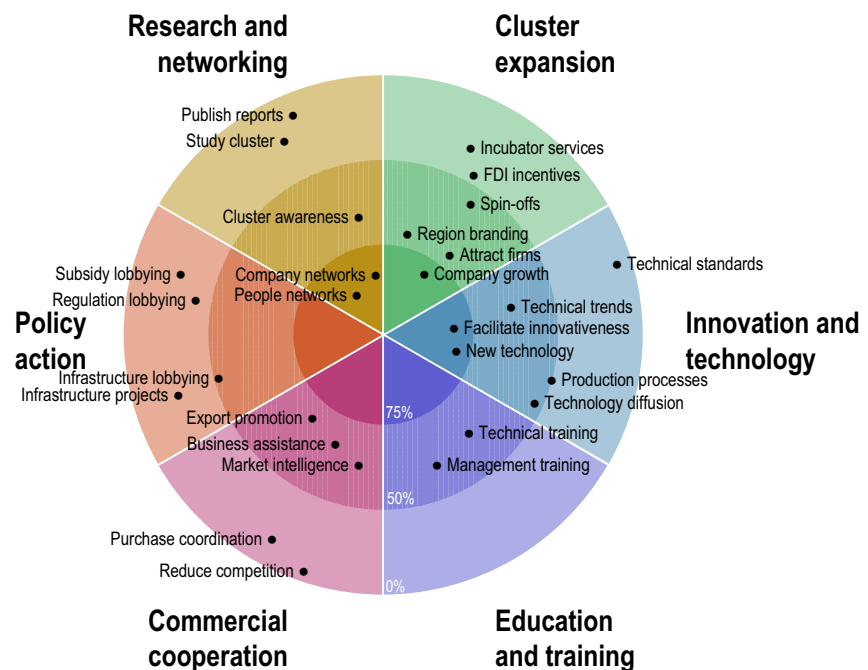
Figure 24

Characteristics of the cluster served by the cluster initiative
Source: GCIS 2003

important clusters within the region and within the nation. They are internationally competitive and are made up of a great number of companies, and have a number of internationally competitive suppliers and buyers. Both older, well-established and younger clusters are represented in the survey.

A few clusters display cooperation of a type that could be described as cartel-like. This is not associated with strong, dynamic clusters (see Figure 24).

Figure 25
The Cluster Initiative Target Board
Illustrates six segments of related objectives. The more frequent an objective is, the closer it is to the centre. Objectives inside the centre and middle rings are performed by 75% and 50% of the CIs respectively.



Objectives

The objectives of cluster initiatives vary greatly. Some have the limited scope of providing some commercial cooperation for the members, such as joint purchasing or export promotion, while others have ambitious goals including improving the innovativeness of the cluster. With the help of the survey, one can classify these objectives by grouping objectives together that are logically similar and statistically correlated, i.e. a CI that performs one also tends to perform the others. This gives six segments of objectives, which are illustrated in the Cluster Initiative Target Board (see Figure 25).

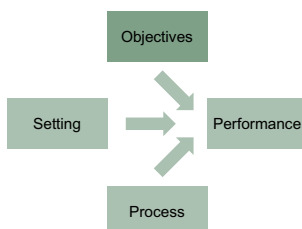
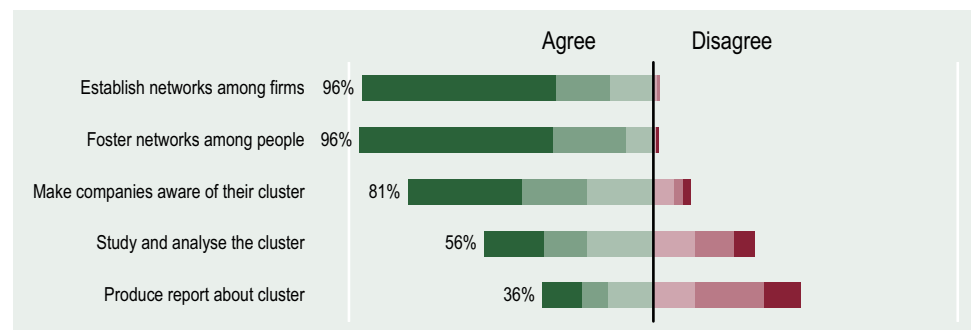


Figure 26
CI objectives: Research and networking
Source: GCIS 2003



One segment contains objectives related to building networks and researching the cluster. General network building, both among companies and among individuals, is the most

common objective performed by virtually every CI. Raising general awareness among the cluster members is also very common. Cluster studies are less popular, and producing reports about the cluster is not considered an important objective by many CIs.

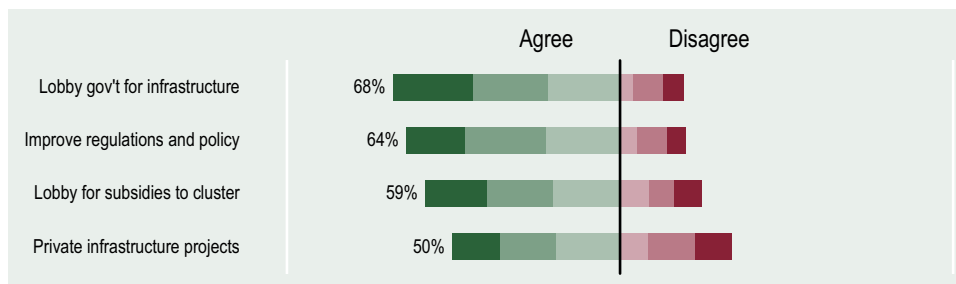


Figure 27
CI objectives: Policy action
Source: GCIS 2003

The policy action segment primarily has to do with the cluster approaching government for different types of support. Lobbying for improved infrastructure, regulations and policies, and subsidies to the cluster is done by many CIs. Closely related to these activities are infrastructure projects carried out by the CI itself, which half of the CIs do to some degree.

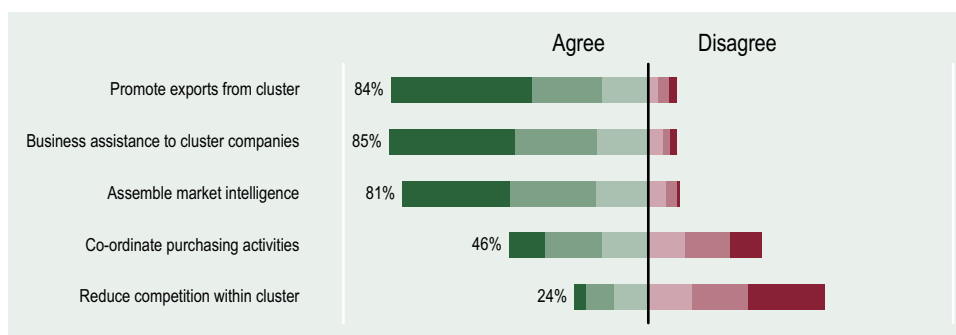


Figure 28
CI objectives: Commercial cooperation
Source: GCIS 2003

Companies in a cluster also cooperate commercially. The most common form of cooperation is export promotion. Many CIs also provide other forms of support, in the form of business assistance or assembling market intelligence. Less common is coordination of purchases. A small number of CIs engage in somewhat controversial efforts to divide the market among themselves and other forms of competition reduction.

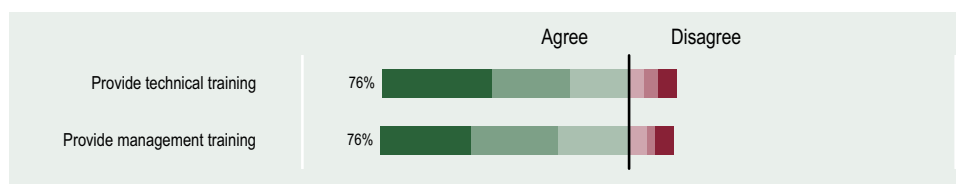
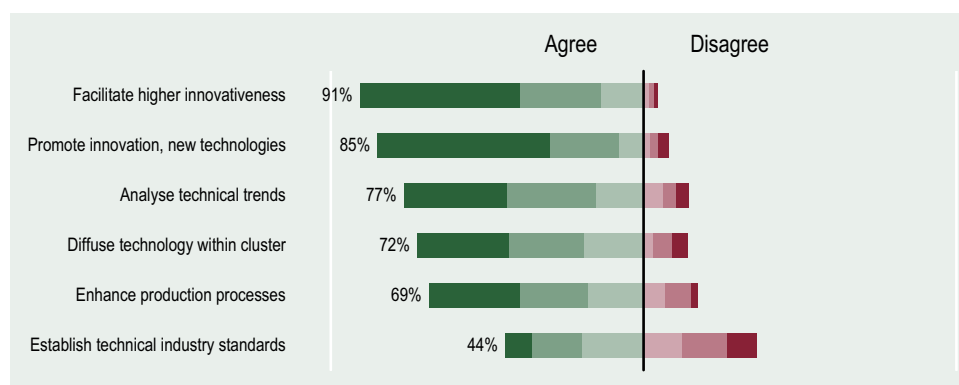


Figure 29
CI objectives: Education and training
Source: GCIS 2003

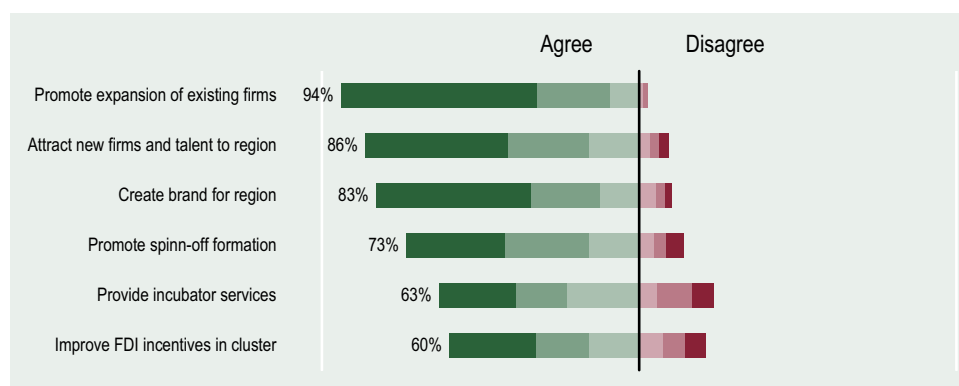
Upgrading human capital in the cluster is done through management training and technical training. The latter is also related to the next segment, which deals with innovation.

Figure 30
CI objectives: Innovation and technology
Source: GCIS 2003



In general terms, promoting innovativeness is at the heart of what most CIs do. Specifically, this can be done in different ways. Promoting new technologies is a very common objective. Analysing technical trends and diffusing technology within the cluster are also similar objectives. Some CIs engage in improving production processes. A less common way of upgrading a cluster technically is by establishing technical industry standards.

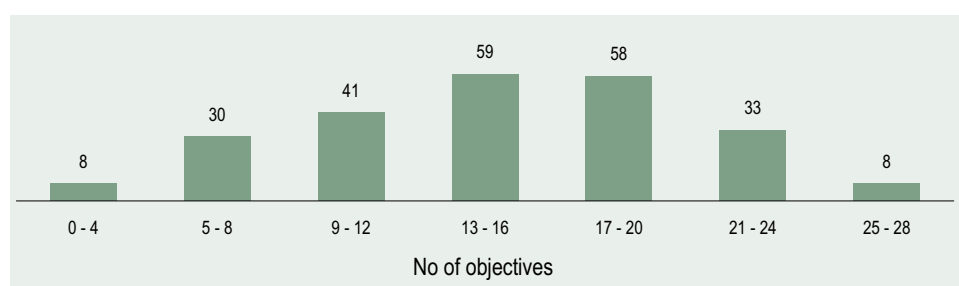
Figure 31
CI objectives: Cluster expansion
Source: GCIS 2003



Finally, expanding the cluster is also a key objective for most CIs. The methods include external growth (by attracting new firms and improving FDI incentives) and internal growth (spin-offs and incubators). Brand-building relates strongly to external growth objectives and is therefore part of this segment.

Wide or narrow CIs

Figure 32
Breadth of objectives
Source: GCIS 2003



Most CIs pursue a fairly wide range of objectives (see Figure 32), suggesting that they are considered as a general tool for cluster improvement, rather than a highly specialised one. Respondents agreed (“completely” or the level below on the seven-step scale)

that on average 15 objectives were important for their CIs. 66% of the CIs perform at least one objective in at least five of the six segments in the Target Board.

Process

Who takes the lead?

The processes through which CIs are initiated and organised take on many different forms. Although all CIs by definition are partnerships of industry and government and/or universities, the relative importance of these parties may vary. In particular, it is interesting to note who took the initiative to launch the CI and who finances it.

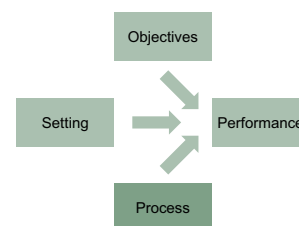
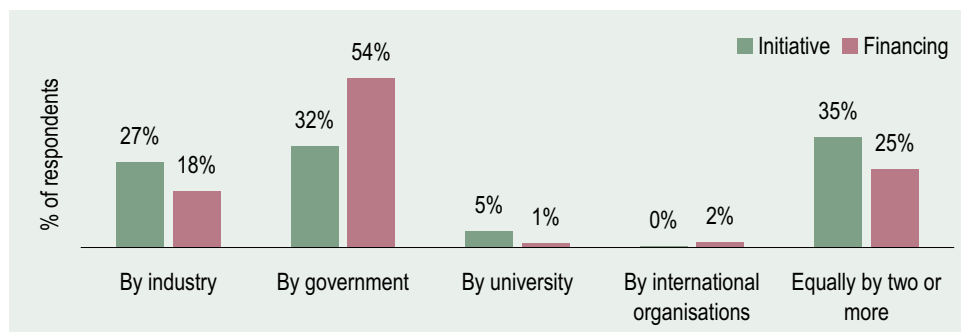


Figure 33

Initiating and financing CIs

This graph shows who *primarily* took the initiative to set up the CI and which part is primarily financing it. Source: GCIS 2003

Taking the initiative to set up a CI is most often done jointly by two parties, usually industry and government, or primarily by government. In 27% of the cases, however, the initiative came primarily from industry. In terms of financing, government is even more important. In most cases, government is the primary source of funding and only 18% of CIs are primarily funded by industry (by membership fees, for example).

A small number, 5%, of the CIs were initiated by the university sector, and university funding of CIs is even more unusual. International organisations have initiated only one of the researched CIs, but they do provide the main funding for four. (See Figure 33 above.)

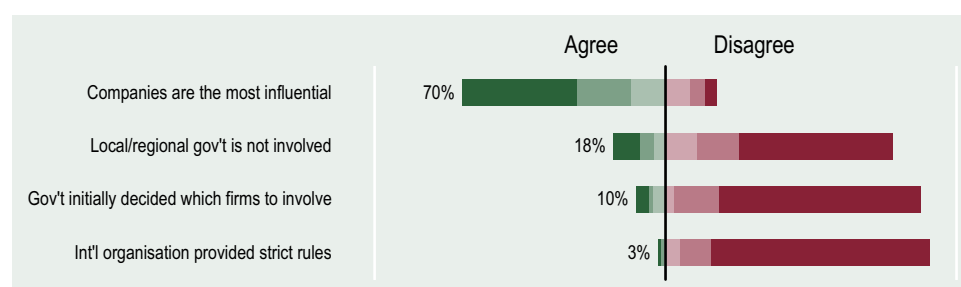


Figure 34

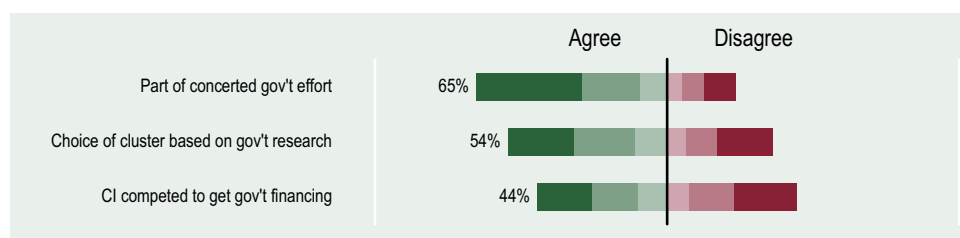
Influence over the setup and governance of the CI

Source: GCIS 2003

Most CIs are dominated by industry. 70% of respondents agree that companies are the most influential parties in steering their CI. Local or regional government is usually involved, which means that government involvement is typically not limited to the national level. In a few cases, government initially decided which companies would be involved, and the survey shows that in those cases companies remain less influential.

In rare cases, international organisations decided how the CI was set up (see Figure 34 above.)

Figure 35
Government and the set-up of the CI
Source: GCIS 2003

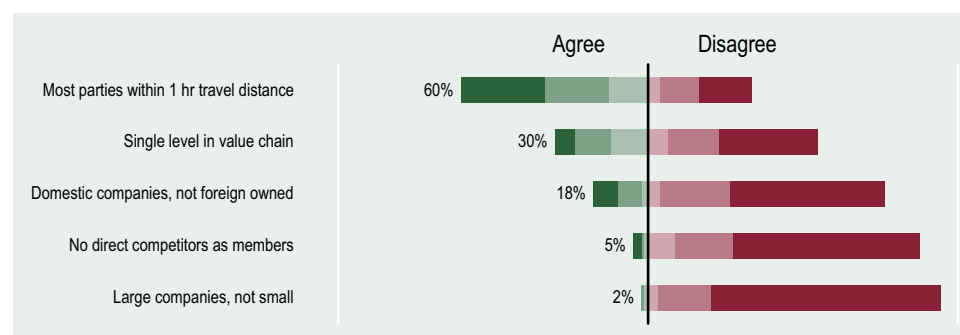


Many CIs have been formed not on an *ad hoc* basis, but as part of a concerted government effort to improve competitiveness. (See Figure 35.) In many cases, government made their choice to support a particular cluster with a CI based on research identifying attractive industrial sectors. Often, this was combined with a process where clusters had to compete with each other in a bidding process to receive financing.

Who can join?

By nature, a CI has an industry focus and a geographical focus. However, some CIs are more narrowly defined than others, both in terms of geographic area and the companies they target. (See Figure 36 below.)

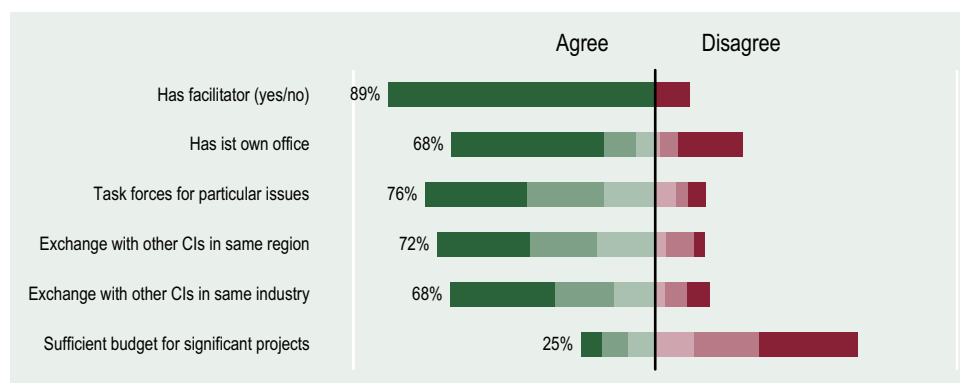
Figure 36
Scope of CI membership
Source: GCIS 2003



In many cases, a sufficiently narrow geographic delimitation allows CI members to access each other easily. A majority of CIs agree that their members are within one hour's travel distance from each other.

Limiting the type of companies that are targeted is more rare. The most frequent restriction focuses on a single level in the value chain, e.g. certain producers but not their suppliers or customers. Few CIs exclude foreign-owned companies, and even fewer aim to include only companies that do not directly compete with each other.

Figure 37
CI resources and facilitator
Source: GCIS 2003



Resources and facilitators

Almost all CIs, 89%, have some kind of facilitator, a person devoted to working at least part-time to manage the CI. Often the CI also has an office of some kind. (See Figure 37 on previous page.)

Typically, the CI sets up taskforces to work on particular issues. It is also common for CIs to exchange experiences with CIs in other industries, as well as with CIs in the same industry but in other regions.

However, there is a limit to the resources available to the CIs. The budget is usually sufficient only for the day-to-day work. For “significant projects,” CIs typically have to seek separate funding.

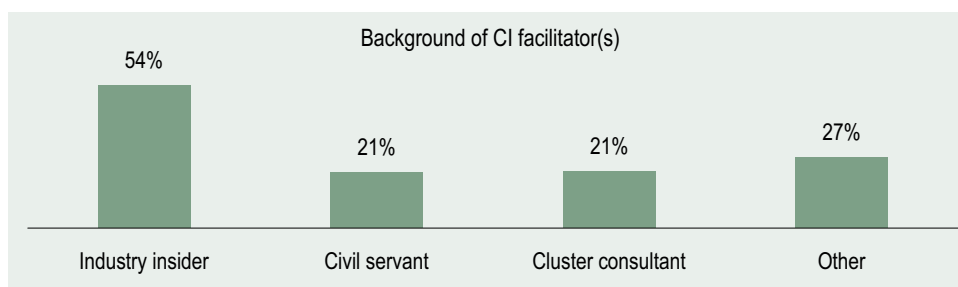


Figure 38

CI facilitator background

More than one background could be selected – a facilitator can have multiple backgrounds and a CI can have more than one facilitator – which is why the total exceeds 100%.

Source: GCIS 2003

The typical CI facilitator has a background within the cluster industry. Civil servants, with backgrounds in government, and cluster consultants are less frequent. Some facilitators have other backgrounds.

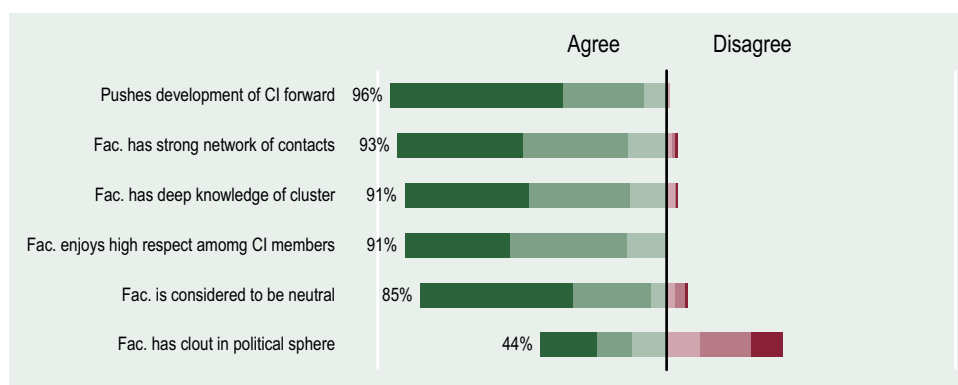


Figure 39

CI facilitator's strengths and weaknesses

Please note that in many cases it is the cluster facilitator who is the respondent.

Source: GCIS 2003

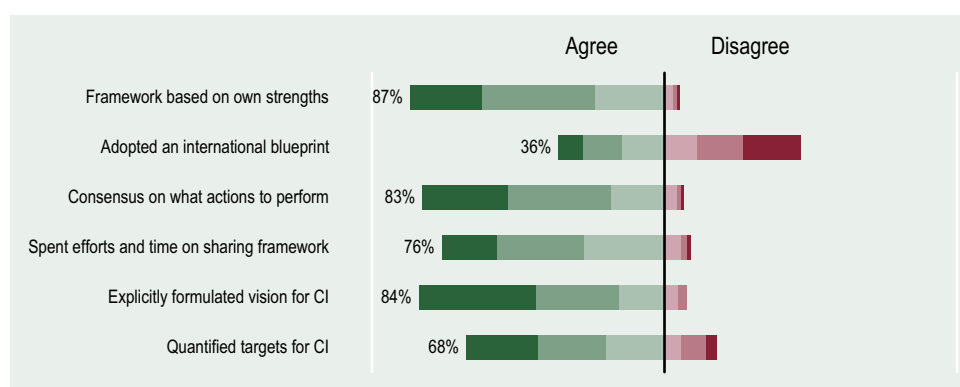
Cluster facilitators feel that they play an important role in pushing the development of the CI forward. They generally consider themselves well connected, knowledgeable and respected by the CI members. They are also considered to be neutral, not representing any particular party.

In many cases, facilitators feel that they lack political clout. This is less of a problem for industry insiders than for civil servants or consultants. (See Figure 39 above.)

Building a framework – is everyone on the same page?

To bring a cluster together in cooperation requires that there is some form of shared idea about why the cluster initiative is beneficial and how it is supposed to work. Most CIs base such a framework on an analysis of their own cluster's specific strengths and capabilities. (See Figure 40 on next page.) Some, however, also look at international models and adopt them as a blueprint for their own CI. There seems to be little

Figure 40
Building a framework for the CI
Source: GCIS 2003



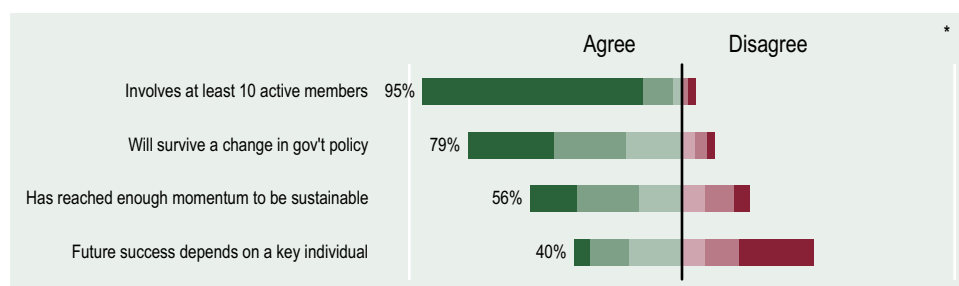
contradiction between these two approaches: those who adopt a blueprint base their framework on their own strengths almost as much as those who do not use a blueprint.

In most CIs, there is a consensus about what actions should be performed within the CI in order for the CI to be successful. There is usually an explicitly shared vision for the CI and often much effort and time is spent on sharing the framework with the involved parties. While the CIs usually have an explicit vision to share, quantified targets are less usual.

Reaching momentum

The rest of this chapter is devoted to CIs that have developed beyond their initial stage. For that reason, responses for CIs that were initiated in 2001 or later have been disregarded, leaving 143 CIs initiated in 2000 or earlier.

Figure 41
CI reaching momentum
Source: GCIS 2003



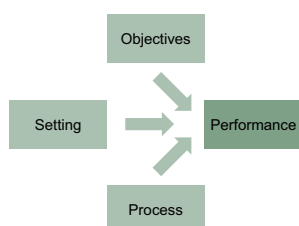
Having reached this age, virtually all CIs have acquired at least ten active members, although a small group of CIs still operate on a smaller scale.

Most of these older CIs feel that a change in government policy would not mean the end of the CI. However, some have not yet reached enough momentum to be sustainable. One reason for CIs to feel hesitant about the future is their dependency on a single key individual – often the facilitator. (See Figure 41.)

Chapter 5 deals further with the topic of how CIs develop over time.

Performance

The survey suggests that many CIs are successful and contribute to the development of the cluster they are set up to serve. This section describes success in terms of improved competitiveness, cluster growth and goal fulfilment. There are many intricate issues relating to how one measures success, and they are discussed further in the box “Measuring performance” in the next chapter.



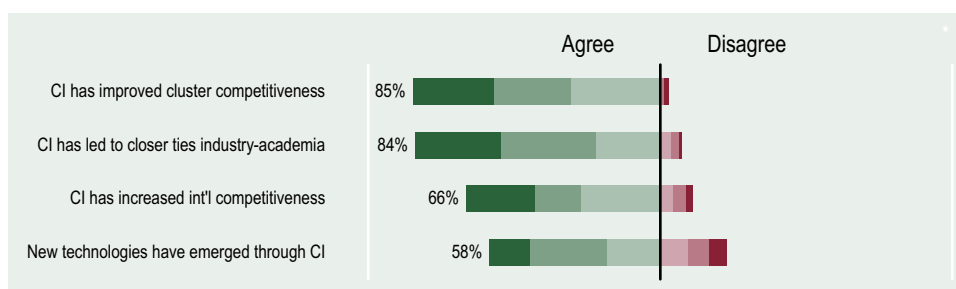


Figure 42
CI performance: improved cluster competitiveness
Source: GCIS 2003

Improved competitiveness of the cluster

Almost all respondents do agree that the CI has helped improve the general competitiveness of the cluster. (See Figure 42 above.) A usual outcome is closer ties between industry and academia.

Fewer respondents agree, though, that the CI has helped firms become more competitive on an international level and there are even more CIs who doubt that new technologies have emerged as a result of the CI.

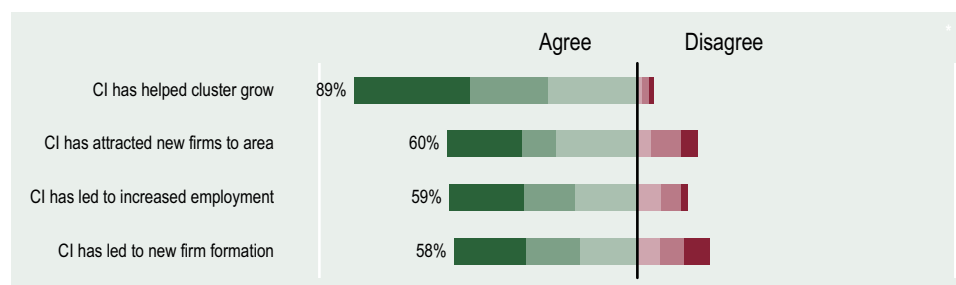


Figure 43
CI performance: cluster growth
Source: GCIS 2003

Cluster growth

In general terms, about 90% of the respondents agree that the CI has helped the cluster to grow (see Figure 43 above). However, the exact nature of this growth is, in some cases, elusive. Considerably fewer, but still a majority of about 60%, agree that this growth meant higher employment. Roughly the same number agrees that new firms were attracted to the area or new firms were formed as a result of the CI. 17% of those who say the CI helped the cluster grow do not agree, surprisingly, that employment has increased, new companies have been attracted, or new companies have been formed.

Goal fulfilment

About four out of five CIs have performed reasonably well in terms of meeting their goals and living up to expectations. (See Figure 44 below.)

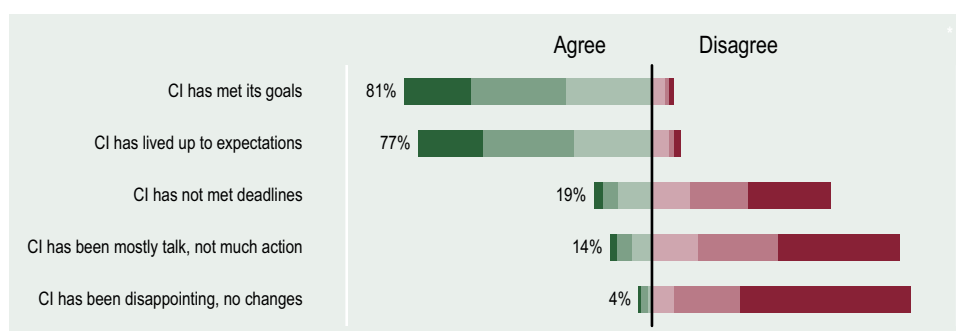


Figure 44
CI performance: goal fulfillment
Source: GCIS 2003

Some CIs do have problems. Some fail to meet their deadlines and some tend to be more talk than action. On the whole, though, only a small share have been disappointing and have not led to any changes.

The next chapter looks at factors that impact performance.

Characteristics of successful cluster initiatives

Cluster initiatives differ widely in their profile: their setting, their objectives, and their organisation. CIs also differ in terms of their performance, i.e. their impact on improving growth and competitiveness. This chapter analyses the links between aspects of the CIs profile and their performance, and draws conclusions on the key characteristics of successful CIs.

Using survey responses, we measure performance in the three dimensions defined in Chapter 2: improving the cluster's *competitiveness*, achieving cluster *growth*, and fulfilling the CI's *goals*. Within these dimensions, we use the survey responses on individual questions, in particular on attracting new firms and on increasing international competitiveness. These two questions put the cluster in the context of global competition, the first between locations and the second between companies, and are thus particularly important measures. In most cases, we report the results for only one of the two questions. The response profiles tend to be, however, quite consistent.

For survey respondents to be able to have a sense of a cluster's performance, the CI has to have been operational for some minimum time. We set this cut-off time at 2–3 years and include only the 143 survey responses on CIs initiated in year 2000 or earlier in the analysis of this chapter.

Measuring performance

A major problem in analysing CIs is how to measure the degree of success or failure. For a single CI, or a small group of CIs, one method is to establish and measure a set of quantitative criteria. However, for a large group of CIs with widely varying objectives in different countries, one must employ a more generic approach. We have chosen to focus on three basic aspects of success: cluster competitiveness, cluster growth, and CI goal fulfilment.

Improved competitiveness and growth are fundamental purposes for a CI. From an external perspective, if the CI has no effect on the cluster it is set up to serve, it is questionable whether the project can in fact be considered to be a “CI” in our sense of the term.

From an internal perspective, the CI can be more or less successful in meeting its goals, whatever they may be. A modest CI, set up merely in order to perform cluster mapping or perform some limited service for the cluster, may not have much effect on the competitiveness or growth of the cluster, but can still be considered to be a success in relation to its narrowly defined targets.

These three aspects of performance are measured by using the same kind of agree/disagree questions as in the rest of the survey. This is because it would be highly complicated to devise a method suitable for hundreds of CIs across the world to measure performance in a reliable, quantitative manner.

The drawback of this method is that we rely on the perception of the respondent, who is often the facilitator and thus has a vested interest in the project. Therefore, the replies are probably biased: it is possible that, on average, respondents present their CIs in a positive light. This means that for individual CIs, we cannot be sure exactly how successful they are, and as a whole, the picture painted here may be too rosy.

However, when it comes to comparing large groups of CIs, the bias becomes less of a problem. If, for example, we want to examine if a certain method, X, leads to better performance, we can compare CIs who use more of X with those who use less of it. If there is a difference between the groups, it suggests that method X has an effect on performance – unless, of course, we have reason to believe that the bias for the much-X group is different from the bias of the less-X group, and this is rarely the case.

Figure 45

Relationship between setting and performance in attracting new firms

The bars indicate how much each of the listed setting factors (an advanced scientific community, etc.) affects the CI's success in attracting new firms to the region. A high positive value indicates a strong relationship. A negative value indicates a reversed relationship. Significance level 5%.

Source: GCIS 2003



The impact of the setting on CI performance

Three dimensions of the setting in which a CI operates have a particular influence on its likelihood to succeed: The quality of the business environment, the structure and content of economic policy, and the strengths of the cluster.

The microeconomic business environment

Two aspects of the business environment have a particularly strong influence the performance of the CI, here measured by the successful attraction of new firms. (See Figure 45 above.) One is strictly economic: the presence of an advanced scientific community and of many strong clusters is an asset. The other is more cultural: a high level of trust between companies and between the private and public sector is positive for the CI.

Policy matters

Both the content of economic policy and the structure of the economic policy making process are important for the success of a CI. (See Figure 46 below.) Measuring CI success by its impact on international competitiveness of the cluster, economic policies

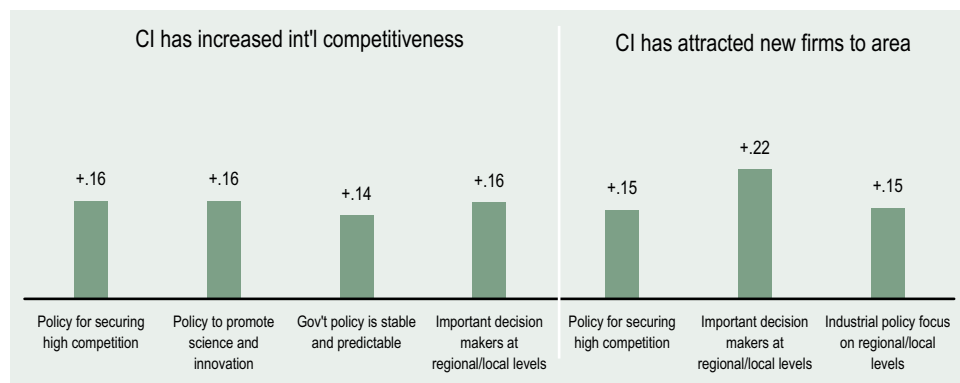


Figure 46

Relationship between political setting and performance in attracting new firms

Source: GCIS 2003

Statistical methodology

This section is based on an analysis of the statistical covariance of the various factors covered in the survey. Since the survey uses a Likert scale, ranging from “disagree completely” to “agree completely,” the data consists of ordinal variables, which require special statistical methods.

The graphs in this chapter are based on Somers's D. This is an ordinal symmetric measure, used to determine the correla-

tion between two variables. As a rule of thumb, a Somer's D value of less than 0.1 indicates a weak, 0.1–0.2 a moderate, 0.2–0.3 a moderately strong, and above 0.3 a strong relationship. The significance level applied is 5%.

There is a particular risk of bias when one compares objectives and performance. The espoused objectives might reflect an after-the-fact perception of what the CI was aiming for. It is possible that respondents play down or emphasise certain objectives to better reflect what was actually achieved.

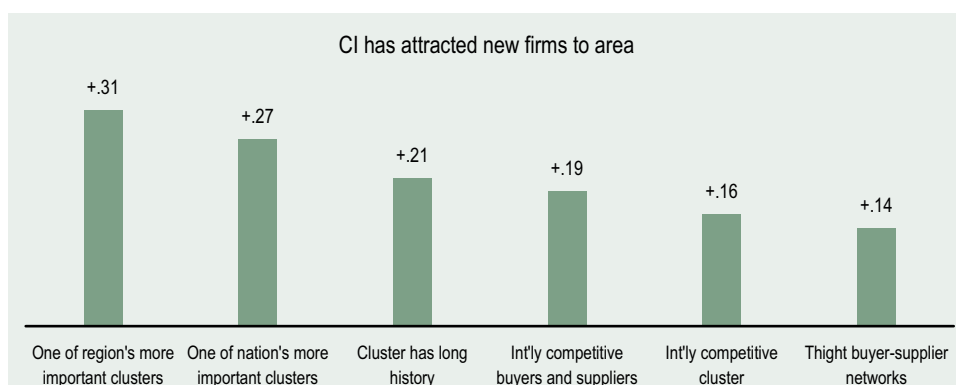


Figure 47
Relationship between cluster setting and performance in attracting new firms
Source: GCIS 2003

that secure high levels of competition and promote science and technology have a positive impact on CI success. A policy process that supports stable and predictable decisions and allocates important decisions to the regional and local level is also positive.

Measuring CI success by its impact on growth (the attraction of new firms), in terms of policies again high levels of competition register positive. In terms of process, decision rights on the regional and local level again proves important, both on overall policies and on industrial policies in particular.

Cluster strength

A strong tendency is that CIs serving strong clusters perform better, both in terms of increasing competitiveness and generating growth. (See Figure 47 above.) CIs for clusters that are of national or regional importance are better at attracting new firms, and the same is true for clusters with long histories, many companies, internationally competitive buyers and suppliers, and tight networks of buyers and suppliers, and are generally internationally competitive.

Choosing objectives

We have looked at the relationship between objectives and performance in two ways: First, we have identified which chosen objectives are more closely related to success in achieving either higher competitiveness or high growth (attraction of firms). Second, we have tested the relationship between the breadth of objectives named and the success of the CI.

Objectives for competitiveness

The CIs that have promotion of innovation and new technologies as an important objective are clearly more successful in improving competitiveness. Other similar ob-

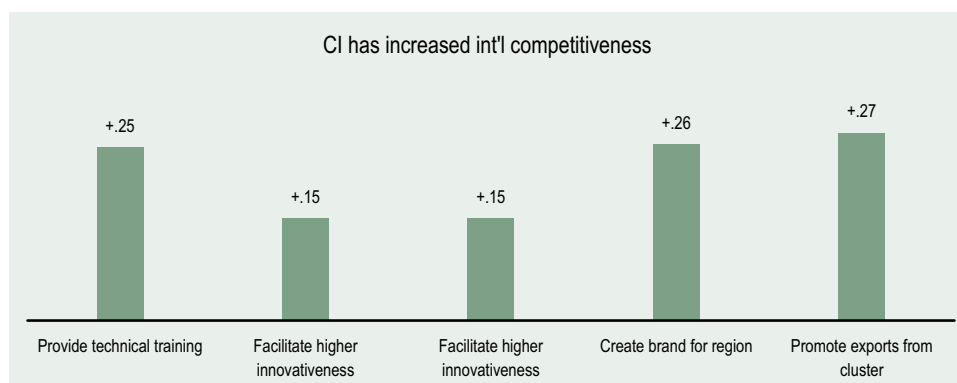
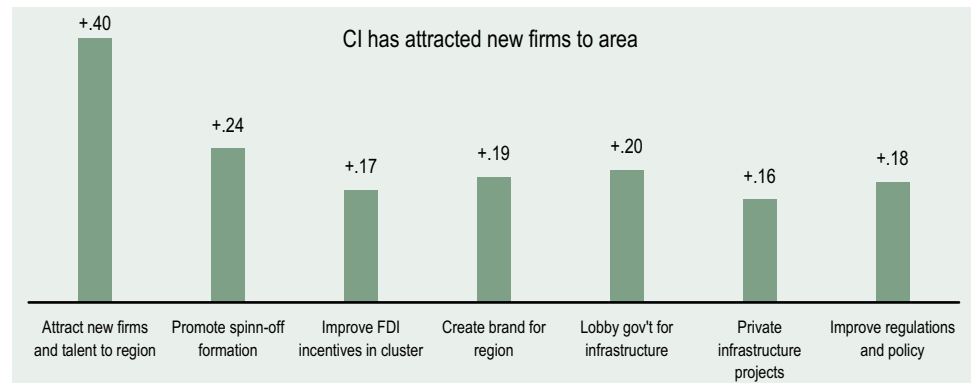


Figure 48
Relationship between objectives and performance in increasing the cluster's international competitiveness
Source: GCIS 2003

jectives with a positive relationship to competitiveness are facilitating higher innovativeness, providing technical training and, to a lesser degree, analysing technical trends and establishing technical industry standards. There are also other direct or indirect approaches to increasing competitiveness: brand building and export promotion are both strongly related to improved competitiveness (see Figure 48 on previous page).

Figure 49
Relationship between objectives and performance in attracting new firms
Source: GCIS 2003



Objectives for growth

When it comes to generating growth, another set of objectives is more important (see Figure 49 above). Obviously having the objective to attract new firms is strongly related to performing well in this area. Promoting spin-offs and improving FDI incentives are also related to attracting new firms. Less obvious is that lobbying government for improved infrastructure is strongly related to attracting new firms, as is fostering networks among people in clusters.

Focus or width — which is best?

The survey replies do not suggest that a narrow or focused CI approach is better than a broad. On the contrary, virtually every performance parameter (except possibly the ability to meet deadlines) is positively related to having a broader range of objectives. Increased competitiveness, contribution to cluster growth and goal fulfilment all follow this pattern. This holds true whether we define width as the number of individual objectives, or the number of segments in the Target Board covered.

This is not merely an effect of “survivor bias,” since, as we shall see in Chapter 5, older CIs do *not* tend to have more objectives than younger ones.

Getting the process right

We have looked at a number of dimensions of the CI structure and process and their impact on CI performance: the source of financing, the role of the government in the initiation of the CI, the membership profile, the access to know-who and resources, and the conceptual framework applied.

Initiation and finance

Who should initiate or finance a CI? The government, industry, or both?

The survey does not suggest a clear-cut answer to this question. There are no significant differences in performance for CIs initiated by government, industry, or jointly. Both in terms of growth and in terms of competitiveness, these three groups have fared equally well.

Nor is there any significant difference if they are grouped by main financing source. Government-financed CIs do not perform significantly better or worse than those financed primarily by industry or equally by industry and government.

The only pattern emerging from the data is that the few CIs initiated primarily by the university sector have performed somewhat better in terms of improving ties between industry and academia, which is not surprising.

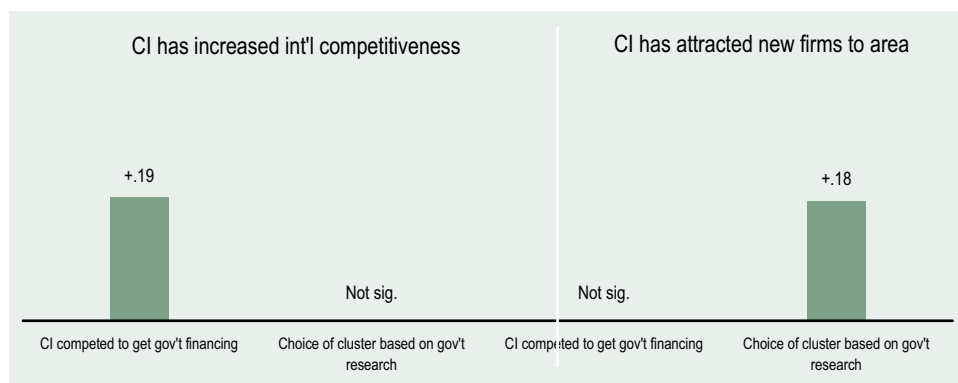


Figure 50
Relationship between performance and early government intervention
Source: GCIS 2003

Early government intervention

The findings are mixed regarding government actions on an initial stage to ensure the success of a CI (see Figure 50 above). On the one hand, those CIs that went through a process of competing with other CIs to get government financing tend to perform better in terms of competitiveness, but not in terms of attracting new firms. On the other hand, if government bases its choice of which cluster to support with a CI on research identifying “attractive” industry sectors, this is related to better performance in attracting new firms, but not to increasing competitiveness.

There are other types of government intervention, which have no significant effect at all. If the government decides from the start which companies to involve in the CI – instead of leaving this choice to the industry or having the CI open to all – there is no measurable effect (not shown in graph).

Picking the right members

Limiting the scope of the CI by aiming for a certain subgroup within the cluster as members does not help performance. (See Figure 51 below.) CIs with most members within one hour’s travel distance, CIs with members on a particular level in the value chain and not their suppliers or customers, CIs avoiding having direct competitors as members, and CIs aiming at large companies rather than small ones have not per-

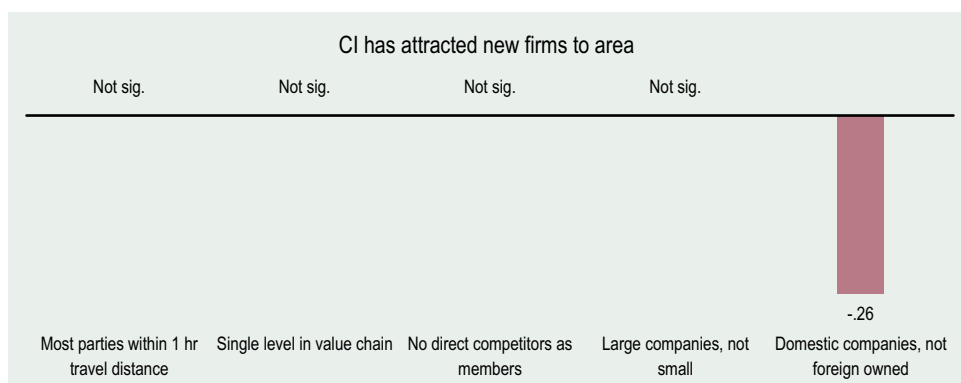
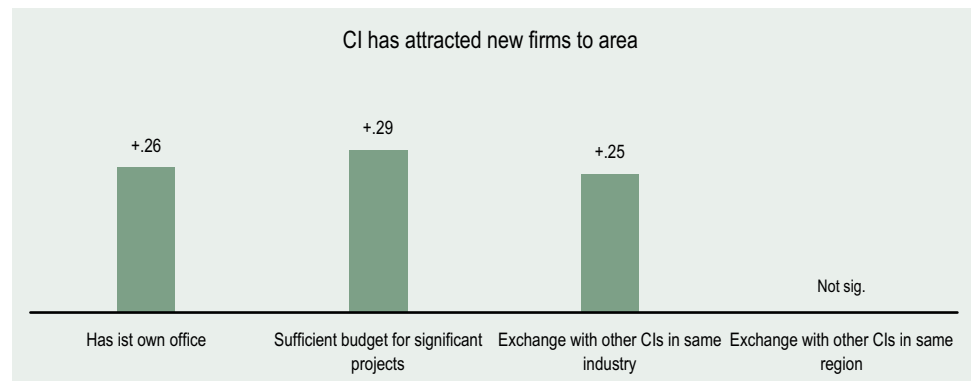


Figure 51
Relationship between membership scope and performance in attracting new firms
Source: GCIS 2003

formed better in attracting new firms or any other aspect of performance. Aiming for domestic companies rather than foreign-owned companies actually has a considerable *negative* effect on attracting new firms and on improving international competitiveness.

Figure 52
Relationship between CI
resources and performance in
attracting new firms
Source: GCIS 2003

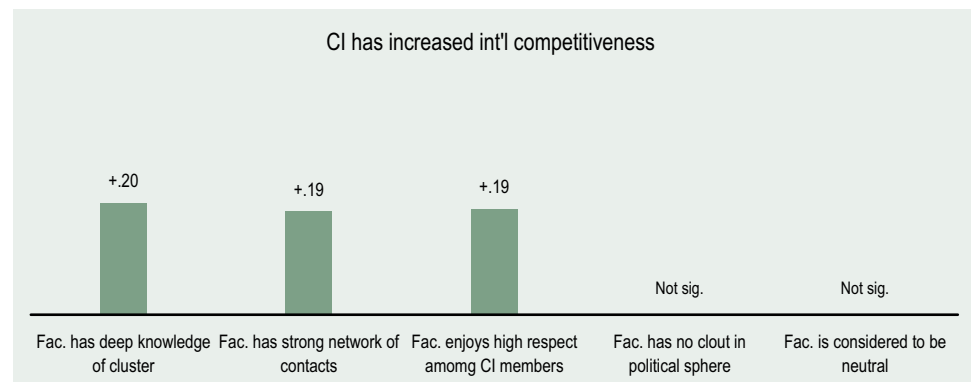


Having the right resources

Having the right set of resources to work with is important for success. (See Figure 52 above.) A budget that allows a CI to carry out significant projects without seeking separate funding is strongly related to attracting new firms, as is having an office for the CI.

Many CIs have exchange experiences with other CIs. If this involves CIs in the same industry, but in other regions, this is connected to attracting new firms.

Figure 53
Relationship between CI
facilitator qualities and
performance in increasing the
cluster's international
competitiveness
Source: GCIS 2003



The facilitator (see Figure 53 above) is another factor that has importance for the success of a CI in terms of competitiveness. Facilitators that have deep knowledge of the cluster and a strong network of contacts contribute more to increased competitiveness. Having political clout and being “neutral,” i.e. not representing any particular party in the CI, is not as important.

The facilitator’s importance in affecting growth is smaller. Apart from a moderate relationship between new firm formation and a strong network of contacts (not shown in the figure), the facilitator’s qualities are not important for cluster growth.

Building a common framework

The framework for a CI can be built based on the specific strengths and capabilities of the cluster in question or by using a more generic framework. (See Figure 54 above.)

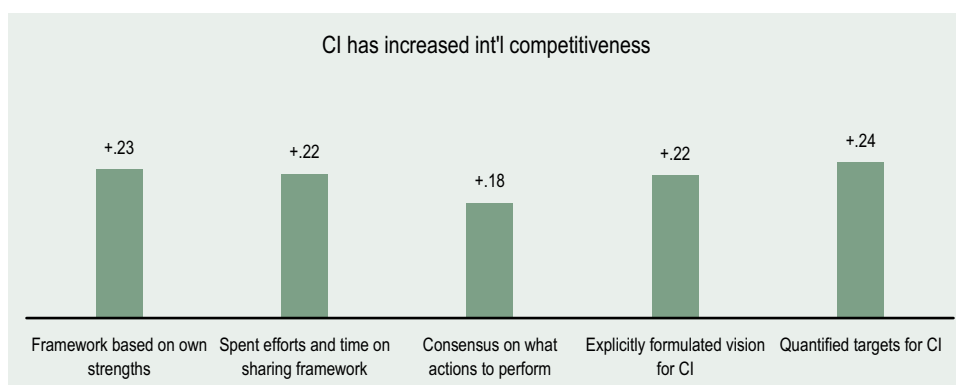


Figure 54
Relationship between building a CI framework and performance in increasing the cluster's international competitiveness
Source: GCIS 2003

The former is strongly related to better performance in increasing competitiveness. It also matters how this framework is shared with the parties involved in the CI. Those CIs that spend time and effort on sharing the framework are more successful. Having achieved consensus about what actions to perform is also related to improved competitiveness.

Framework issues are more important to competitiveness performance than to growth performance. All the above effects have a less pronounced relationship to attracting new firms than to increasing international competitiveness.

Why do CIs fail?

So far, we have focused on what drives performance in terms of competitiveness and growth. But there are also lessons to be learned from CIs that fail in terms of goal fulfilment. What characterises CIs that turn out to be a disappointment? The survey suggest a number of factors. (See Figure 55.)

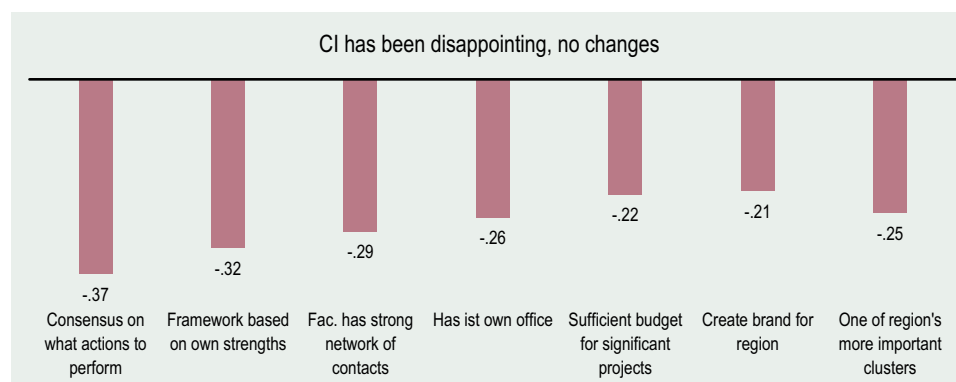


Figure 55
Relationship between various factors and disappointing CI performance
Source: GCIS 2003

The most striking effect is linked to a common framework. Failure is strongly related to a lack of consensus, as well as to the absence of an explicitly formulated vision for the CI and quantified targets (not shown in graph). Often the framework is not adapted to the cluster's own strengths. (N.B. The negative bars show a *reversed* relationship: “*more* consensus – *less* disappointment.”)

Resources also seem to play a role. Disappointing CIs often have no office or an insufficient budget for significant projects. Other process issues that have a moderate relationship to disappointing outcomes (not shown) are limiting the membership scope to only large companies, one level in the value chain, or only domestic companies.

The objective most strongly related to disappointing CIs is brand building. CIs who fail to have this as an objective are more likely to fail. This agrees well with the earlier observation that brand building is an objective with a strong influence on both competitiveness and growth performance.

Finally, there are several aspects of the setting with a relationship to failure. Cluster strength in general is important, especially the cluster's regional importance. Other factors (not shown) like having a national science promotion policy, CIs being considered a useful way of organising industrial policies, having influential local decision makers, and general trust in government initiatives are moderately related to disappointing performance.

A closer look at four aspects of cluster initiatives

This chapter gives a more detailed analysis of four different themes:

- How do CIs develop over time?
- What role does the cluster profile play in shaping the cluster initiative?
- Do CIs in countries with a developed “cluster culture” behave differently?
- Do CIs with a substantial budget behave differently?

The first theme is a more detailed analysis of the part of the CI lifecycle that the survey covers. The second theme takes a closer look at one part of the setting, namely the strength of the cluster, and examines how it affects objectives and process.

The third deals with countries where CIs are an established concept, and the fourth theme examines the effects of having a larger budget.

How CIs evolve

Because the Global Cluster Initiative Survey has, so far, only been carried out once, the data does not allow tracking CIs as they develop over time. It is, however, possible to draw some conclusions by comparing different age groups of CIs to see if older CIs differ from younger ones.

One must keep in mind, though, that this method introduces two possible sources of error, which cannot be avoided. First, there is a gradual filtering process as unsuccessful CIs are abandoned and this effect becomes stronger the older the age group is. Age groups will necessarily differ because of survival selection if for no other reason. Second, CIs initiated before 1996 represent different generation than those initiated in 2002. When one compares the two age groups, one does not actually see how a certain generation develops over time, only how the generations differ. Having said this, there are nevertheless some insights to be gained from such a comparison, for example regarding differences in sustainability, financing, objectives, resources, and success.

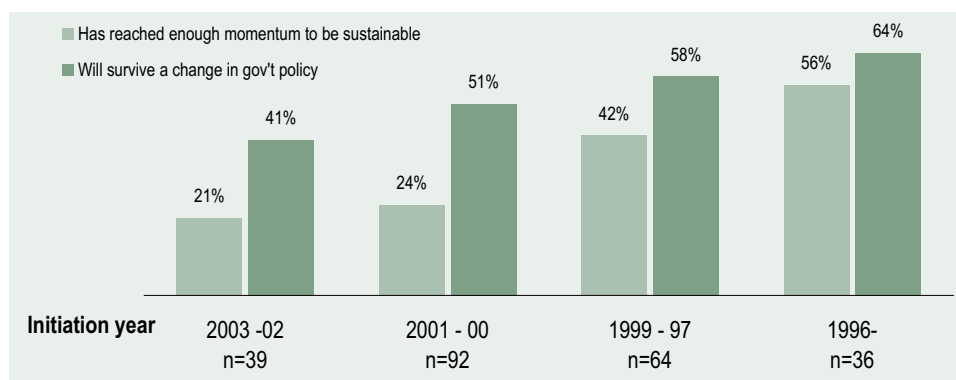


Figure 56
Build-up of CI momentum by year of initiation
% of respondents who “completely agree” or the level below on a seven-step scale
Source: GCIS 2003

Reaching momentum

It takes time for a CI to build up momentum. (See Figure 56 on previous page.) The share of CIs that have reached enough momentum to be sustainable increases gradually with age. During the first three years, this build-up is slow, but in the older age groups the momentum is considerably higher. The survival of a CI can depend on changes in government policy. Some CIs are more vulnerable to policy changes than others, but over time this vulnerability decreases.

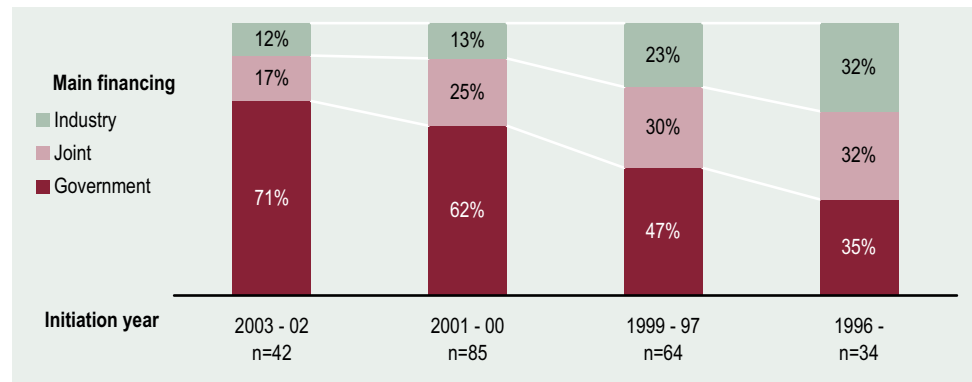


Figure 57
Main CI financing source by
year of initiation
Source: GCIS 2003

Financing

Financing is a factor that changes greatly with age. (See Figure 57 above.) Government plays an important role in providing seed financing for new CIs, and for newly-started CIs, government financing dominates completely. Over time, membership fees and other sources of support from industry increase in importance, reducing the reliance on government backing.

Shifting objectives

Most objectives do not show signs of becoming more or less important with time. Among the exceptions is commercial cooperation. Market intelligence, business assistance, and purchasing coordination all decrease somewhat with age (but export promotion does not). This suggests that commercial cooperation provides short-term pay-offs for the members and is therefore suitable in the initial phase of the CI when trust is still being built. Also, management training (but not technical training) declines somewhat over time.

Building up resources

Although even the youngest CIs have facilitators, CIs nevertheless tend to develop a more robust structure and build organisational resources. Older CIs are more likely to have an office. (See Figure 58.)



Figure 58
CI office, facilitator, and budget
sufficient for significant projects
by year of initiation
% of respondents who "completely
agree" or the level below on a
seven-step scale
Source: GCIS 2003

However, older CIs do not tend to feel less restricted by budgetary limits than young ones. There is only a small – statistically not significant – increase with age when it comes to having a budget sufficient to undertake larger projects without separate funding. This could suggest that revenues do not increase over time, but are merely shifted from one source (government) to another (industry). Alternatively, it could mean that regular revenues are used for expanding the day-to-day activities of the CI, while projects continue to be financed through separate funding.

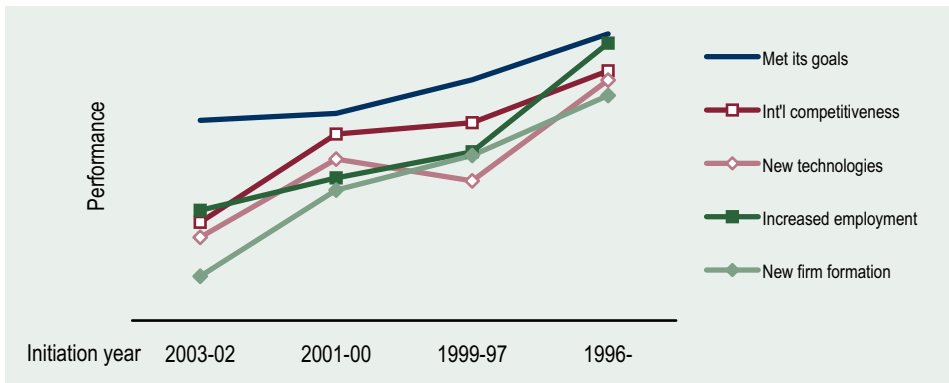


Figure 59
Performance development by year of initiation
Average response. The slight decrease for new technologies from 2001-00 to 1999-97 is not statistically significant.
Source: GCIS 2003

Success comes with time

As one might expect, older CIs have achieved better performance, both in competitiveness and cluster expansion (see Figure 59 above). For example, older CIs have performed better in terms of increasing international competitiveness and generating new technologies, as well as increasing employment and helping new firm formation.

How the cluster shapes the CI

In Chapter 4, we explored the strong relationship between cluster strength and performance. In this section we will examine in more detail the nature of this relationship and what mechanisms are behind it.

Clusters can be of regional or even national importance. Both these factors, as seen in Figure 60, have effects on three selected performance parameters. The relationship between regional importance and attracting new firms to the cluster is particularly strong, which is indicated with a heavier line.

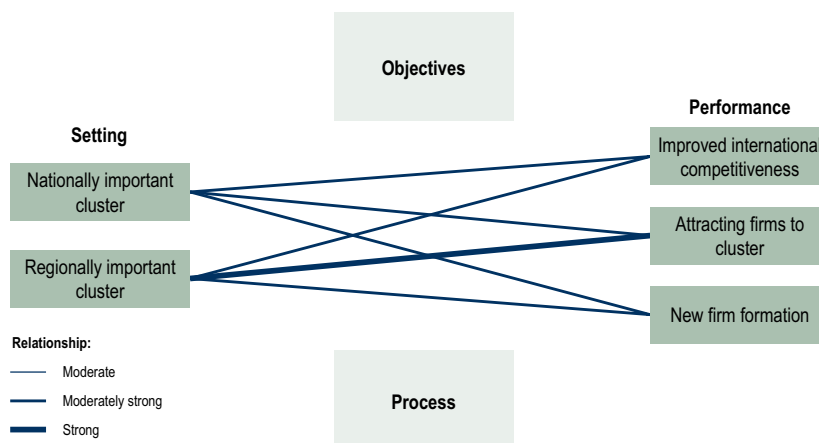


Figure 60
Relationships between cluster importance and performance
Source: GCIS 2003

Not shown in the figure, but equally strong, are relationships between national/regional cluster importance and increased general competitiveness, closer industry-academia ties, and increased employment. The trend holds true also if we chose other performance parameters.

Is there an underlying tendency for strong clusters to pursue certain CI objectives or follow processes that can explain their success?

Figure 61
Relationships between cluster importance and objectives, and objectives and performance
Source: GCIS 2003

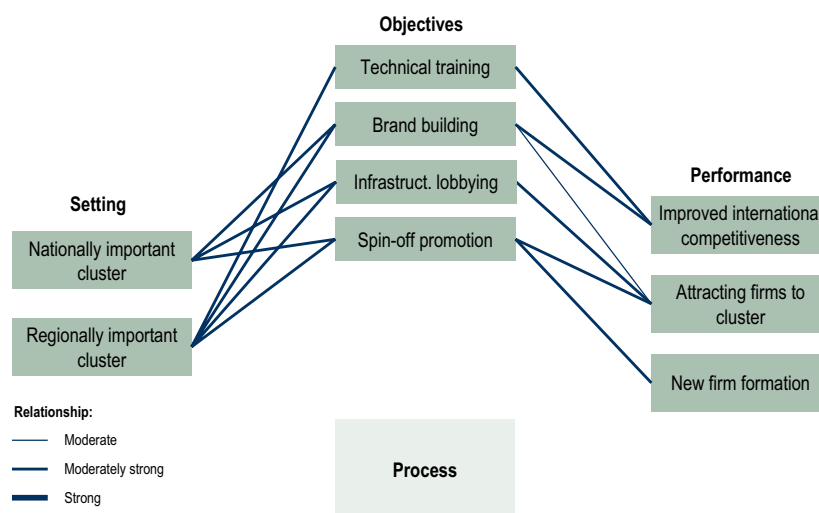


Figure 61 shows the relationship between cluster importance and a selection of objectives, and between these objectives and performance.

Technical training is one objective which is related to improved international competitiveness, and the figure shows that regionally important clusters are more likely to provide technical training.

Another factor closely linked to international competitiveness, as well as to attracting firms to the cluster, is brand building, which is also more frequently pursued by strong clusters. Similarly, we see that lobbying for infrastructure, which is related to attracting firms, is more often pursued by important clusters.

The conclusion is that CIs that serve regionally or nationally important clusters tend to rank certain important objectives higher, which can be one reason why such CIs are more successful.

Figure 62
Relationships between cluster importance and process factors, and objectives and performance
Source: GCIS 2003

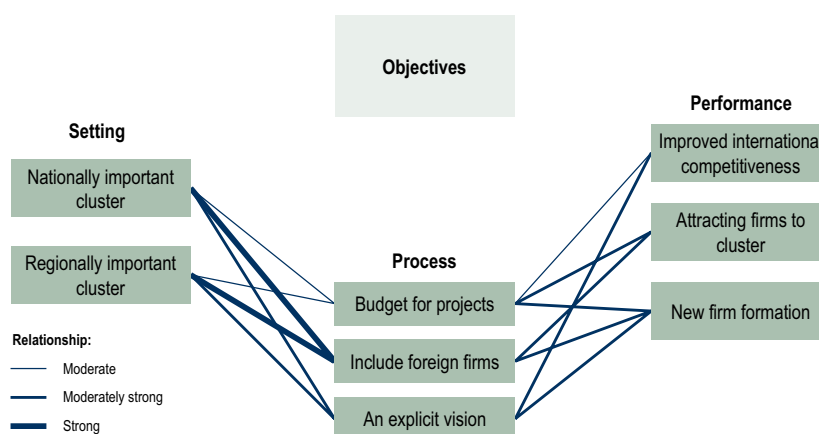
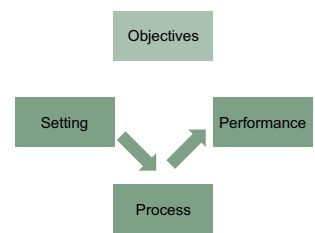


Figure 62 (on previous page) shows that CIs serving important clusters also behave differently in terms of their process. CIs for important clusters have larger budgets – sufficient for significant projects without seeking separate funding – which is related to better performance. A particularly strong relationship is that important clusters tend to not exclude foreign-owned companies from membership. Excluding foreign-owned companies is related to worse performance.

Another factor working in favour of strong clusters is their ability to establish an explicit vision for their CI, which is related to better performance. CIs in strong clusters tend to base their frameworks more on their own strengths and more often set up quantitative targets (not shown in Figure 62).

Relationships like these suggest why the strength of the cluster has such an impact on the performance of the CI. Not only do important clusters have different objectives profiles than weaker ones, they also behave differently in terms of process.



Building on experience

In many countries, working with cluster initiatives has become an integral part of industry policy. The survey clearly shows that this has an effect on many different aspects of the cluster development process. CIs in such countries tend to benefit from the fact that clusters are a well-known concept, which allows them to build their partnerships starting from a higher level of understanding. (See Figure 63.)

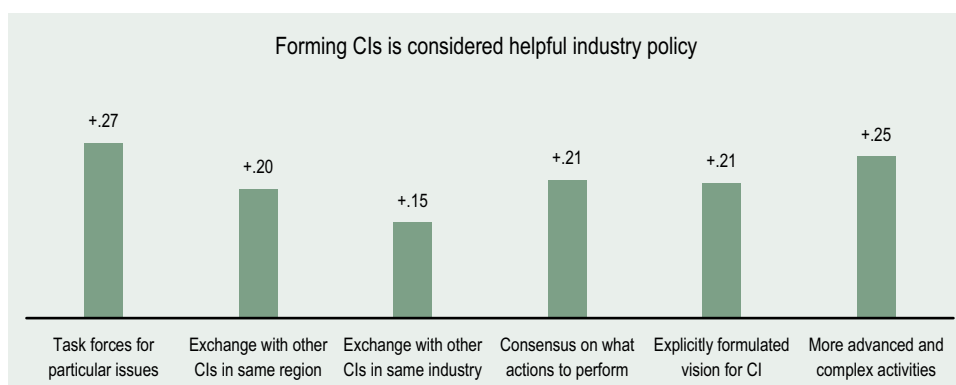


Figure 63
Relationship between policy setting (CIs are considered a helpful way of organising industry policies in the country) and various process factors
Source: GCIS 2003

In countries where cluster initiatives are considered a helpful way of organising industrial policies, CIs operate differently. They are more likely to form taskforces to work on particular issues and they are more likely to exchange experiences with other CIs, which helps performance. More important, since it impacts performance even stronger, is that they find it easier to formulate their visions and achieve consensus about what actions to perform. Over time, they tend to achieve a higher activity level.

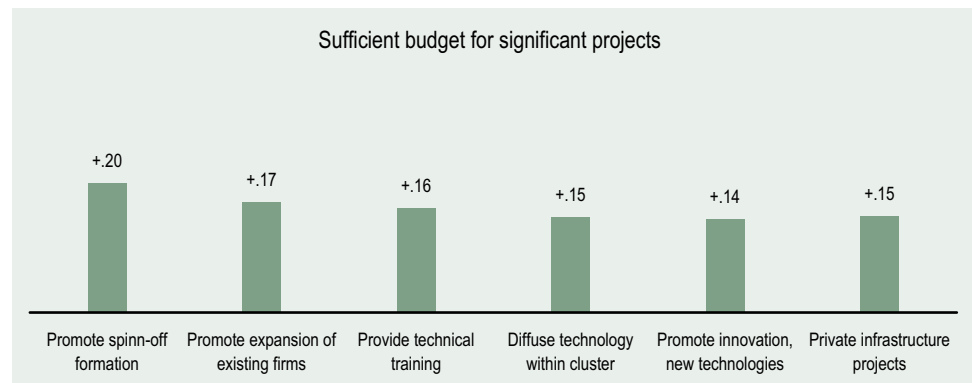
The well-funded CI

Some CIs have large budgets, allowing them considerable freedom in prioritising their activities. Others are run on a shoestring, requiring fundraising for even modest projects. Is a sizable budget actually needed?

The survey shows that CIs with a strong budget are better at achieving their goals and living up to expectations. They are better at achieving growth and somewhat better at generating improved competitiveness. Part of the explanation is found in the

fact that well-funded CIs are sometimes working in stronger clusters, but this connection is not very strong. However, a closer look at objectives provides another piece of the puzzle. (See Figure 64.)

Figure 64
Relationship between having a budget sufficient for significant projects and various objectives
Source: GCIS 2003



Most objectives – for example commercial cooperation, networking, and lobbying – are not affected by budget constraints: they are pursued by CIs with small and large budgets alike. There are six objectives, though, that do show at least a moderate relationship to budgeting. These are objectives that apparently require reliable funding. Cluster expansion, spin-off promotion and expanding existing firms are associated with bigger budgets. Improving competitiveness, technical training, technology diffusion and new technology promotion are also related to bigger budgets. Private infrastructure projects are also budget dependant. CIs that wish to pursue these objectives have reason to consider the implication this has for their budget needs.

Cluster initiative cases

Every cluster initiative has unique characteristics, as does the cluster it serves. Both the history behind a CI and the evolution following the formation of the CI are different for each cluster. In total, 24 cases from around the world were studied (see list on page 91). This chapter will highlight some of the unique characteristics in four selected cases: Scotland's digital media and creative industries cluster initiative, the consumer electronics CI in Catalonia, Spain; the automotive components CI in Styria, Austria, and the textile cluster CI (CITER) in Emilia-Romagna, Italy. All cases exhibit a high degree of success, but each case describes a very different story.



Figure 65
Location of the 24 cases studied
Cases presented in Chapter 6 are
marked with dark circles

Scotland's digital media and creative industries CI, the U.K.

Material for this case report was supplied by Mike Tibbetts.

The general business environment

Scotland's economic history is rooted in traditional industries. In the west of Scotland and in Glasgow, importing and processing tobacco gave way to heavy engineering and the manufacturing of ships and rail locomotives. "Clydebuilt" became a global brand for Scottish manufacturing. In the East and in the capital, Edinburgh, printing and ship-broking led to financial services and banking. Further north, Aberdeen progressed from fishing and whaling into oil with the opening up of North Sea fields. Dundee was always famous for "Jam, Jute (for linoleum floor coverings) and Journalism."

To a large extent, the Scots' popular image of their economy has been, until very recently, conditioned by this traditional background. A "real" job is one in which something is manufactured. A "real" business produces useful physical products. The powerful engines of the national economy are large companies and corporations with large

workforces and long-term stability. The ideal path for a young person was to learn a recognisable trade or skill and get a good job for life applying this trade or skill in a substantial industrial context. Whilst the late 20th century shift towards service-oriented businesses and smaller-sized enterprises applied just as much in Scotland as anywhere else, the popular psyche remained wedded to the old industrial models. Alongside this rather old-fashioned industrial paradigm, Scotland has always maintained a very high respect for education, innovation, cultural life and the spirit of enterprise. Although belonging to the United Kingdom, Scotland has maintained a separate and significantly different educational system with its own accreditation agencies and distinct qualifications. Scotland is very appreciative of its indigenous universities and there is a strong preference among Scottish students to attend local universities and colleges. All levels of society are proud of Scotland's literary traditions (e.g., the ubiquity of "Burns Suppers") and cultural forms of expression, such as theatre and music, are popularly valued. The main cities' museums and art galleries are frequent venues for family outings, which leads to continuing public investment in such amenities, from the establishment of the "Burrell Collection" in Glasgow in the 1970s to the more recent opening of the Glasgow Science Centre as a public showcase for Scottish technological innovation.

Over recent decades and most particularly since 1991, Scotland has also maintained a national effort led by the public sector to develop its economy pro-actively. In 1991, two major agencies involved, the Scottish Development Agency (largely concerned with physical infrastructure) and the Training Agency (focused on skills and workforce development), were combined into a unified agency, Scottish Enterprise. This new agency had an extraordinarily comprehensive remit to develop the Scottish economy across a broad spectrum: from workforce to company development, from physical to research infrastructures, from indigenous development to globalisation and internationalisation.

In 1993, Scottish Enterprise worked with the Monitor Group to identify which industrial sectors were particularly key to the future prosperity of Scotland so that appropriate priority could be given to them. By 1997 this project had matured into a major implementation of economic development along cluster lines, with clusters defined as identifiable groupings of the economic base where global economic advantage and competitiveness could be built by improving the inter-linkages and collaborative mechanisms between firms and the other economic entities with whom they were functionally interdependent. The first four target clusters were identified as oil and gas, food and drink, tourism, and semiconductors. Initiatives were launched in all these areas.

At the same time, Scottish Enterprise was continuing its work with other key industries with a single-sector rather than a cluster approach. One of these industries was filmmaking, which was prompted by losing to Ireland a large part of the making of the Mel Gibson feature, "Braveheart" about William Wallace, an iconic figure from Scottish history. As a result of the film initiative, a public-sector body "Scottish Screen" had been set up to complement local support services, such as the Glasgow Film Office. At the same time, multimedia began to emerge as a subsection of the software industry with potential for its own focused development. It was realised that there are considerable synergies and overlap between multimedia and film, in terms of innovations in digital film, animation and on-line video. It was further conjectured that other industries might be similarly "clustered" with film and multimedia as a result of convergence in business models as well as technological convergence.

A basket of industries was identified as possible components of a meaningful cluster, which acquired the name “creative industries.” This immediately provoked protest from other industries. If these were “creative” industries were all other industries therefore “uncreative?” It was pointed out forcefully that creativity is vital to all industries. This apparently esoteric discussion actually led to a useful definition of “creative industries,” which has been applied in Scotland. Whilst creativity is undoubtedly essential in all industries, most of the time it is harnessed as an agent of change or improvement. A factory does not grind to a halt because nobody had a creative idea today. By contrast, printing presses certainly would fall idle if nobody could think of a new newspaper article or book manuscript. Studios would be empty if nobody could think of a new screenplay. In other words, there are a set of industries in which the fruits of human creativity are a primary raw material to the business process rather than just a source of change or improvement. The industries in Scotland which conform to this “creativity as raw material” model are:

- Music
- Design (including fashion design and crafts)
- Publishing
- New media (including multimedia and Internet)
- Computer games and packaged leisure software
- Films
- Broadcasting (including TV and radio)
- Advertising
- Architecture
- Cultural industries (museums, art galleries, antiques, etc.)

The cluster

Because these industries had not previously been considered – anywhere in the UK – in light of their creative elements, the Standard Industrial Classification (SIC) coding structure by which all UK economic activity is monitored and reported, did not accurately map the creative sectors. For example, measures of employment in the film industry aggregated all the ancillary employment in the physical production of film stock and cameras, processing negatives and the production of the necessary chemicals, etc. The first job of the Scottish Enterprise cluster team was to form new estimates of the creative elements of these industries. Whilst this could not be done with absolute rigor, consultation with all available stakeholders, including the Central Statistical Office of the UK government, yielded a broad estimate, which was considered by all concerned as sufficiently robust to be useful. The Scottish creative industries cluster is estimated to add approximately £5.3 billion per annum (4%) to Scottish GDP and support around 70,000 full-time equivalent jobs. By any standards, this makes the creative cluster a substantial element of the Scottish economy, fully comparable with electronics (45,000 employees) and whisky (55,000 employees).

As mentioned above, most of these industries had not previously been explicitly targeted for economic development, so the early stages of engagement primarily aimed to establish contact and promote communication, both between creative sectors and Scottish Enterprise and among the creative sectors themselves. Scottish Enterprise was gratified to find a highly enthusiastic response from the industries themselves, who were keen to explore collaboration opportunities, primarily related to technological innovation. As the Edinburgh-based publisher Canongate told Scottish Enterprise, “...we notice that in our contracts with authors, we are buying all sorts of additional rights to electronic publication, but we have no idea how to make use of those rights.

We would like to talk to someone in the games industry or a web designer.” Two hundred representatives of creative companies at a plenary symposium in 1999 were asked, “If there were one single thing that Scottish Enterprise could do to promote the growth of this cluster, what would it be?” Their answer was, “Keep us talking to each other.”

Objectives

Having confirmed that Scotland’s creative industries constitute a meaningful cluster and that industry participants were keen to get engaged, the next stage was to move to a more structured diagnosis of market failures and opportunities. It immediately became clear that an outstanding engine of immediate growth was digital media and its potential to transform all of the constituent industries in the cluster, from digital radio, to virtual reality for architecture, from high-tech print of digital designs on fabrics to sophisticated innovations in games development. From the very beginning, therefore, the focus has been on digital media and the ability of these industries to capitalise on its benefits.

Further, four main areas of market failure and development opportunity for the cluster were determined:

- A more “creative-friendly” and supportive business infrastructure in Scotland.
- More effective means of identifying and nurturing creative talent.
- A greater international reputation for Scotland as a creative centre (Abertay University in Dundee was a pioneer in focusing on computer games and interactive entertainment as a major specialisation).
- Greater interaction between Scotland’s creative industries and the research community (from virtual reality to animation, and from computer science through artificial intelligence to communications technologies).

Process issues

The creative industries cluster initiative was primarily run by the national office of Scottish Enterprise, but with extensive consultation and collaboration with industry representatives. For example, Scottish Enterprise works closely with all the appropriate trade associations, as well as other public-sector agencies such as the Scottish Arts Council.

Importantly, there is strong regionalisation of the cluster initiative, too. The “core team” that formulates and maintains the day-to-day strategy agenda for the cluster is made up of representatives from five of the local enterprise companies in the Scottish Enterprise network, in addition to four members from Scottish Enterprise National. This has led, in some cases, to component sectors of the creative industries cluster being co-ordinated from a local office, in line with regional strengths. For example, Tayside (Dundee), although technically a local office of Scottish Enterprise, provides national co-ordination to the games industry. Similarly, Glasgow co-ordinates design.

Digital media and creative industries development is also a very high priority for the UK government and the newly devolved Scottish Executive. There is, therefore, strong political support for this intervention and on-going co-operation with government, particularly collaboration with the industry departments (Department of Trade and Industry in London, Department of Enterprise and Lifelong Learning in Scotland) and cultural departments (Department of Culture, Media and Sport in both London and Scotland)

Scottish Enterprise is also active outside the cluster initiative via schemes such as the Small Business Gateway (SBG), which provides general support to small businesses. Since a number of creative businesses characterise themselves as artistic or cultural rather than purely commercial, new schemes are developed in partnership with the

Scottish Arts Council to provide equivalent small business support, but expressed in more congenial “artistic” language, through a specialised gateway, the “Cultural Enterprise Office.” A pilot of this concept in Glasgow has proved highly successful in attracting clients unlikely to approach conventional support agencies. Typically a creative company in Scotland employs fewer than 20 people and turns over less than £200k per annum. However, the CI also includes significantly large players capable of competing effectively in UK and global markets, particularly in computer games, television production and music.

There is not a dedicated, separate office for the creative industries initiative. In general, support and activity are delivered through existing structures and bodies such as Local Enterprise Companies, industry associations and partners such as the Scottish Arts Council.

When the action phase of the cluster intervention was launched in April 2001, the programme had resources of £25 million over a 3–5 year period.

The creative industries CI is now one of eight to nine cluster initiatives underway in Scottish Enterprise. There is regular interchange and collaboration with other clusters to monitor areas of opportunity in overlapping industries such as bio-informatics.

The main facilitators of the cluster initiative are the national and local members of the Scottish Enterprise “cluster team” described above.

The shared vision for the cluster initiative is published in a document entitled “Creative Scotland: Shaping the Future” and the CI’s progress through 2002 was published in an annual report for the cluster.

Whilst there is strong commitment to this initiative, there is a clear exit strategy for Scottish Enterprise. The aim is to achieve self-sustainable corrections to market failures in order to eliminate the need for further intervention of this type by the end of a 3–5 year period. There is regular evaluation of progress and annual updating of baseline data to track the progress of the cluster. There is long-term sustainability from the initiative, however, in the enduring products, which will remain from the cluster intervention. These include major infrastructure projects such as the large-scale development of media centres in Glasgow and Dundee, and also the permanent legacy of new and expanded agencies such as Scottish Screen, the Scottish Arts Council and more specific bodies such as the games industry association, TIGA Scotland.

Performance

To date, the CI has performed well in the four focus areas. Linkages between industry and academia have been improved, and CI activities have generated new spin-offs. Linkages have improved through fellowships for scientists to make room for sabbaticals (to commercialise an idea) and intermediary technology institutes. Penetration of export markets has improved through trade missions and international events. To lure new talent into the cluster special talent events and recruitment fairs have been carried out in Scotland. On the infrastructural side a digital media quarter in Glasgow is under construction and plans cover a new Digital Media Park in Dundee.

The consumer electronics cluster initiative in Catalonia, Spain

Material for this case was supplied by Alberto Pezzi.

The general business environment

Catalonia, one of the seventeen Spanish regions, has enjoyed a high degree of autonomy since 1977, when the Generalitat, a political institution for the self-government

of the region, was established. With a population of around 6.5 million (approximately 15% of the Spanish population), Catalonia accounts for 19% of the Spanish GDP in 2001. Catalan exports are close to 28% of total Spanish exports. In terms of industry composition, chemical, metal manufacturing and food are the most important industries. Electronics and electrical equipment account for less than 10% of both employment and GDP.

Catalonia was one of the pioneers in Spain and worldwide in promoting cluster-centred development policies and by 1995, when the first consumer electronic cluster project was started, more than ten cluster reinforcement initiatives had already been carried out. In 2003, the number of cluster initiatives that had been carried out in Catalonia was 24. In more recent years, the regional government of Catalonia has defined and launched a broader microeconomic agenda, including a series of horizontal initiatives and areas of action, particularly innovation management processes, quality in manufacturing, and export promotion. The change in policy has risen from a bottom-up analysis rather than a top-down approach, and is a result of the cluster initiatives launched in the 1990s.

The cluster

Historically, Catalonia had been the leading manufacturing centre of radios and TV sets in Spain. This created an early industrial base of electronic component suppliers (mainly valves, condensers, loudspeakers and components for radio receivers). TV production rose rapidly in the 1960s. In the 1980s, several Japanese and Korean companies including Sony, Panasonic, Sharp, Pioneer, and Samsung decided to invest in Vallés County close to Barcelona. Thanks to a strong investment attraction policy (including the creation of a Japanese School), in 1995 the consumer electronics clusters in the Vallés area included more than 50 companies whose revenues had reached €600 million and who employed around 5,000 workers. The clusters accounted for 78% of consumer electronics production in Spain. Additionally, the cluster included other actors such as associations, educational centres, and laboratories, including: LGAI (General Test and Research Laboratory), ANIEL (National Association of Electronic Industries), ASCAMM (The Association of Mould and Die Manufacturers of Catalonia). ASCAMM provided training, assessment and certification and conducted significant research in a technology centre created in 1987.

The regional television channel, TV 3, played a dual role in the electronic sector as a catalyst of new technologies and as a user. As a catalyst, it established cooperation with manufacturers for the development of new standards. TV3 worked with Hitachi and Pioneer to introduce Dolby surround-sound systems. There was no structured framework for cooperation among companies in the cluster, and many problems remained. Despite a diffused network of suppliers, one of the main problems involved inefficient logistics and slow delivery time. The suppliers were too fragmented and too small to respond to the strict requirements of the global manufacturers in the cluster. Furthermore, the certification and technological institutes and the industry associations were not able to give adequate services to meet the cluster's needs.

Objectives of the cluster initiative

According to the industrial policy approach carried out by the Generalitat de Catalunya, the overall purpose of the CI was to improve the long-term competitiveness of the cluster. In particular, this initiative was centred on improving supply chains. The OEMs present in the cluster collaborated with the government by assuring their involvement in the project, especially through direct participation of people from technical centres and purchasing departments.

The cluster reinforcement process was carried out in different phases, each with precise objectives linked to the specific domains to be strengthened.

- A first cluster reinforcement initiative was launched in 1995. This initiative mainly addressed reinforcing the overall competitiveness of the cluster and particularly improving the companies' capabilities in design and product development from a technical point of view. Another major objective of this project was to analyse the suppliers' key competitiveness levers regarding quality and cost of the output for the next 3–5 years. This first initiative mainly addressed suppliers.
- A second initiative, launched in 1997 along the lines of action defined in the original project of 1995, was specifically designed to train a restricted group of suppliers in order to improve logistics and overall competitiveness. A selected group of mould suppliers participated in a tailor-made training programme focused on improving the cost and quality of their products and reducing the development time for new products. The programme included a benchmarking trip to Singapore.
- A third initiative, launched in 2000, addressed updating the strategic analysis made in the first project. Increased global competition forced the relocation of production to low-cost countries, in this case to Eastern Europe, forcing firms to reconfigure their value chain activities.

Process

The initiatives were taken by the Regional Government of Catalonia (Generalitat de Catalunya), and particularly by the Department of Industry. The overall framework of the project was financed by the Regional Government. However, some specific follow-up actions, particularly the training initiative, were co-financed with the suppliers, the OEMs and a technological institute. The initiative was the twelfth cluster reinforcement initiative carried out by Regional Government with the same methodology.

The overall initiative involved a very wide range of actors. Despite the fact that suppliers (mould makers) were the main target of the initiative, a variety of other firms (OEMs) and organisations (technological and testing centres, universities, engineering companies, industry associations, etc.) were involved. The initial project, designed as a more typical cluster reinforcement initiative, was carried out over six months with an overall budget of €90,000. The main activities implemented during the project included strategic and environmental analyses, an international benchmarking trip and a series of working groups. The initiative, as is typical in Catalonia, did not rely on any physical structure or on a hired cluster manager. The entire process was driven by the regional government through the involvement of its personnel. A consultancy, specialised in cluster reinforcement, was hired by the Regional Government and acted as a facilitator during the entire process.

Each of the involved actors (regional government, suppliers and OEMs) took leadership for the implementation and follow-up of the different actions defined at the end of the project. A number of working groups, responsible for different lines of actions, were established using only a very limited budget. Concrete and more targeted projects identified as a result of this initial work were, in some cases, financed by the regional government with a separate budget.

The establishment of a shared framework was one of the main efforts made by the initiative's facilitators. This process was structured into three milestones:

- The first phase was dedicated to mapping the cluster and identifying the main actors and involving them in the project.

- The second phase focused on the strategic analysis of the cluster, including analysis of the industry, business segmentation and the evolution of the strategic options at cluster level. The output of this second phase was shared in a public meeting and included a joint strategic vision of the industry.
- The third phase addressed series of actions coherent with the shared visions. In this case, reduction of time to market was a key issue for the competitiveness of the cluster and all actions were oriented to reinforce this area: better coordination between suppliers and OEMs, development and tapping of new IT tools by suppliers, the design of a more focused training programme for engineers in 3D CAD workstations, investment in Rapid Tooling or Rapid prototyping machines, reduced time for testing moulds, and product certifications.

Performance

The consumer electronics initiative has been successful. It has helped in the process of upgrading suppliers, and changing the value chain configuration of the larger OEMs. When HP closed its manufacturing plant and transferred production to Hungary, it decided to keep and strengthen its worldwide R&D plotters centre in Barcelona. Similarly, Sony established its European Digital TV Centre in Barcelona with more than 100 engineers, while in 1995 it had just a manufacturing plant. New players have invested in the cluster, including contract manufacturers from the U.S. and Singapore. By contrast, the fragmented network of suppliers and lack of electronic component providers are still on the cluster agenda.

The automotive cluster initiative, AC Styria, Austria

Material for this case report was supplied by Uwe Galler.

Background

The AC Styria encompasses the whole Steiermark region and has three regional centres: Graz and the surrounding area, East Styria, and Upper Styria. AC Styria also has cooperative arrangements with Slovenia and Hungary, and with leading production locations including Stuttgart, Turin, Birmingham, Cardiff, and Munich.

The automotive components cluster in Styria comprises the complete value chain with particular focus in the areas of metalworking and metals processing, plastics, electronics and engineering services. The main strength is in the area of development and production of complete vehicles with all-wheel drive technology. There is also new combustion engine and power transmission expertise in the cluster.

Leading companies such as Magna Steyr have been operating in the cluster for more than 100 years. Some 30,000 highly qualified employees are working in the cluster and the automotive industry is one of the most important export industries for Austria. However, only two companies (Magna Steyr and AVL List) were known to the general public, and it was only after some analysis by Styrian companies that the diversity and complexity of the existing cluster became obvious. Prior to the start of the cluster initiative, the image of the vehicle supply industry was not very positive and therefore it was difficult to attract the most talented employees.

Cluster initiative

The economy, and in particular the automotive sector, had to respond to increasing competitive pressures, which raised questions about production locations. A number of investigations were carried out: an initial opinion-gathering project entitled “Vehicle-Cluster” (by the Economic Development and the Industrial Associations of Styria,

Trigon), a technology/policy plan (carried out by a research organisation), the Steiermark Economic Model (by an industrial science institute). Finally, the Styria Economic Development Company (SFG) decided to implement a package of measures designed to form an automotive sector-related cluster. The intended purpose was to pro-actively improve communication, information, and cooperative agreements among the Styrian vehicle supplier companies, the leading OEMs and existing research institutes. The most important objective in the first phase of the cluster initiative was to secure Styria as an independent car production location.

The main part of the promotion/support project was not finance-related. Priority support was given to networking and also education and training programmes. The leading companies integrated into the network included AVL, Eurostar, Chrysler, SFT and small and medium-sized vehicle suppliers and research and development facilities.

Process

Leading companies and representatives of interested companies and research institutes were asked about the approaches and methods to be used to establish a cooperative framework within the automotive cluster in the Styrian region. A project team drew up a list of “possible approaches for cluster development,” which was then assessed with a weighting by those interested. The most prioritised needs from the SMEs and the research institutes were the following (in order of importance):

1. Creation of a catalogue of cluster companies
2. Possibility for information exchange with leading companies
3. Establishment of an ideas and communication platform for management
4. Building new infrastructure
5. Creation of a list of cooperation proposals
6. Establishment of an ideas and communication platform for technical people
7. PR campaign specifically oriented to the requirements of the cluster
8. Joint learning programmes for customers and suppliers
9. Formation of R&D communities internal to the cluster
10. Setting up a cooperation/project budget
11. Periodic cluster information
12. Reciprocal company visits
13. Workshops and technical presentations

These requirements were also recognised by large companies. However, other points were important for AVL, EUROSTAR and SFT including:

- The creation of a vision: How would the profiling as a vehicle region appear? What products/technologies should the region concentrate on in order to achieve a critical mass?
- Analysis of the interdependence of suppliers. Where is the potential in the Austrian supply industry?
- Establishment of a unit designed to provide assistance to potential new suppliers.
- Reducing the gaps in the training of technical employees; promoting team building and speeding up language learning; pursuing the establishment of a technical college specifically for automotive technology.
- Improvement of the basic conditions regarding work permits for foreign employees, and offering English speaking schools and kindergartens.

The cluster formation process went through several development phases:

- Analysis of the actual situation including detailed data regarding position in the value chain, product service programs, certification standards, size classifications, markets, and customer relationships.
- Dialogue with a presentation of the results of the individual working groups with companies and scientific institutes involving SWOT analyses.
- Development of a strategy including the drawing up of a mission statement, a vision statement, procedures, and organisational models.
- Securing long-term stable financing, broad commitment of all political groups and representatives of interest groups.

Based on this dialogue and on examples from abroad, the following four core task areas aimed at developing the automobile cluster were finally established:

- Information and communication including information technology.
- Collecting ideas for cooperation, actively pursuing cooperative possibilities and also defining cooperation projects.
- Inter-company learning ranging from technical presentations and experience exchanges to the formation of supplier associations.
- PR and lobbying to communicate the significance of the cluster and region as a leading economic sector.

After a few years of initiation work, a cross-party think tank decided to deal more intensively with the cluster formation processes. The Steirische Wirtschaftsförderungsgesellschaft, SFG (Economic Promotion Association of Styria) was responsible for the initiative in co-operation with an industrial association. SFG took over the necessary development work, financing and project management. One of the targets at that time was to create a sustainable organisational platform, which could be financed by the cluster partners themselves within four years.

An organisation, AC Styria, was developed with its own advisory board and was funded by membership fees. The AC Styria Autocluster GmbH was established by six different companies and institutes in 1999. In the initial phase from autumn 1999 until the middle of 2000, two honorary interim general managers and a full-time secretary were employed. In 2000, a full-time general manager was employed who, in turn, hired a project manager. The necessary office space was rented in an industrial technology park and thus the infrastructure prepared. The main task of the general manager was reaching economic and financial independence of the GmbH. This aim could be easily achieved by the well-targeted acquisition of new cluster partners (in the first year). The role of ACstyria GmbH is to initiate projects, to motivate projects and to encourage the preparation for jointly realising projects. The organisation has initiated co-operation with other clusters. For example there is co-operation in the area of international supplier exhibitions.

A clear commitment from the Styrian state government and a high personal commitment from the responsible economic state councillor were important for guaranteeing stable framework conditions.

Performance

The cluster initiative has led to improvements in different areas, such as improving the image of the entire sector, attracting new supplier firms to the area, and creating over 10,000 new jobs in the automotive sector in Styria in the last six years. Most of the targets, which were set in 1996, were fulfilled. The competitiveness of the cluster companies has improved and the large number of certificates (QS 9000, VDA 6.x,

ISO/TS 16949) that the AC Styria partners have achieved within a few years is an indication of this.

CITER – Emilia-Romagna, Italy

Material for this case report was supplied by Dr Silvano Bertini.

Background

Emilia-Romagna is one of the Italian regions that has experienced rapid growth based on SMEs and a number of dense clusters. These clusters are characterised by advanced human capital (attitude to work, self-employment and entrepreneurship), social capital (attitude to join efforts, to co-operate, to exchange opportunities and information), institutional integration and local-regional governance (local levels of government, active business organisations, trade unions and other intermediate actors).

This local strength emerged in the context of a rather weak national diamond. Educational levels, public-private investment in research and development, innovation infrastructure and capital markets are not at the same level as in the most advanced OECD countries. The educational level has sharply improved in the last few years, but R&D expenses are still under 1% of GDP. The ICT infrastructure development is still below the average of major countries and IPOs are infrequent. Nevertheless, the region has developed internationally competitive firms, gained wealth and achieved low unemployment. Success factors for SMEs include technical specialisation, the sophistication of accumulated tacit knowledge, the degree of openness, internationalisation and extension of networks.

National microeconomic policies were for many years oriented to sustain process innovation and renewal of technical equipment. Only a small share of public resources was destined to SMEs, while the highest share was used to sustain the larger national state and private industrial groups.

In recent years, the policy instruments destined to SMEs have been transferred to the regional level and with a wide autonomy given to regional governments to establish policy objectives and allocate resources. The Emilia-Romagna government concentrated these resources in supporting business and management innovation and R&D investments.

The regional government adopted a cluster-oriented policy through the establishment of technical service centres within the major local clusters of the region. This policy, widely followed internationally, gave positive results. With increased global competition, such intervention at the cluster level is not considered sustainable by the regional government. The reform of this policy approach is still under development, but is to be launched by 2004. The new assumption is that local clusters can improve their competitiveness only if the whole region's knowledge and innovation base becomes stronger. It is considered necessary to reinforce the regional environment for innovation involving: co-operation between industry and university and research (knowledge-transfer programs), improved IT infrastructure and multimedia, and improvement of learning processes and educational performances.

The cluster

Textile is not the main strength of the region as it is in Veneto, Tuscany, and Lombardy. Emilia-Romagna is mainly active in mechanical engineering and automotives, with some strength in building materials and food processing. The textile cluster represents 18% of regional manufacturing employment. With increased competitive pressure, em-

ployment and business performance was negative in the 1990s. The cluster was originally concentrated around the city of Carpi, but has spread to the provinces of Modena, Reggio Emilia and Ferrara. The strength of the cluster is based on long experience and expertise in design and the use of information technologies. Entrepreneurship is part of the local culture.

The cluster initiative

The first cluster initiative, initiated already in the 1970s, involved technical service centres in the region, contributing to improved design capabilities, marketing and innovative entrepreneurship. In the 1990s, the cluster organisation CITER, which had a background in technical training activities, changed its role to promoting the following main objectives:

- Market intelligence collection
- Market analysis
- Technology diffusion, innovation promotion
- Supporting design activity
- Information about technical standards and assistance for certification
- Providing technical training
- Participating in international projects and partnerships

Process

The initiative to set up the CI had been taken over by the regional development agency (ERVET). CITER accumulated initial experience in the field of technical training activities. On the basis of this experience emerged the need for more sophisticated information services. CITER was partly financed by the regional government and by the services CITER provided. CITER was set up as a consortium composed of ERVET, the Chamber of Commerce, business associations, and 431 SMEs. The position of the region is that after more than 20 years, the cluster initiative must now become self-sustainable and redefine its strategic mission. This can happen with stronger involvement of local actors and a profit orientation on the part of the centre. ERVET will leave the CI by the end of 2003. With CITER becoming more customer-driven, the requests of clients tend to diversify the range of services.

CITER has its office in Carpi, where there are laboratories and other facilities. Normally the director comes from industry. The project areas of CITER include: fashion, marketing, training, quality certification, international cooperation, software, technical analysis, and external relationships. Each of these areas, plus administration, press and communication, has a person responsible. Their backgrounds vary from technical or economic to creative-artistic, according to the different needs of clients and to the range of services.

Performance

The success of this case depended partly on a strong vision shared among the various promoters of the initiative, and the strong commitment of the regional government. CITER was the first successful case of a regional master plan by ERVET, which led to the creation of eight similar technical centres in the region in the 1970s. In the late 1990s, this master plan was no longer effective so there was a need to rethink the strategy. Rethinking the regional strategy turned out to be a complex and time-consuming process. It was difficult to change the mission of CITER as there was disagreement among different opinion makers – some nostalgic for the traditional approach of cluster policy and some in favour of change.

Cluster initiatives in a transition economy: the case of Slovenia

Material for this case report was supplied by Amy Cogan.

Clusters initiatives have generated interest not only in advanced economies but also increasingly in transition and developing economies. While these countries tend to struggle with significant macroeconomic, legal, social, and political challenges, many of them realise that they need to integrate microeconomic efforts into their reforms to achieve real, visible change for their citizens.

Although each country constitutes its own unique environment for clusters and cluster initiatives, transition economies share some common characteristics that differentiate them from developing economies. They are in the process of shifting from a (more or less) planned economy to a market economy, which means they have less experience in competition, fewer institutions of collaboration, and typically exhibit less trust in government initiatives. Furthermore, many transition economies have a legacy of being highly developed economies before the Second World War.

Eight of these countries are now joining the European Union (together with Cyprus and Malta). This process has highlighted the need to bring these economies up to speed quickly.

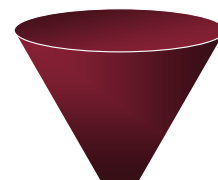
Slovenia is a particularly interesting case that can shed light on the applicability of general conceptions about cluster initiatives to transition economies. Slovenia has led the group of transition countries in terms of economic performance. And the country has made cluster initiatives an important and much publicised element of its economic policy strategy. Its overall success and its significant experience make Slovenia the prime candidate from which to learn about the success drivers of cluster initiatives in transition economies.

Slovenia in transition

History and geopolitical position

Slovenia is a small country, bordering Italy, Austria, Hungary and Croatia. It also has a short coast on the Adriatic Sea. Significant cities are the capital Ljubljana, the university town Maribor, and the port town Koper. 90% of the two million inhabitants are ethnic Slovenes and Slovenian is the official language.

Since the 14th century, Slovenia had been a part of the Austro-Hungarian Empire. After joining Yugoslavia in 1918, Slovenia's economy developed into more advanced production, drawing on the skills of Germans, Austrians and Italians living in Slovenia. After the Second World War, the ruling communist party in Yugoslavia initially followed the Soviet-styled centralised economic system, but after Tito's break with Stalin in 1948, the country developed a more liberal, decentralised economy.



Within Yugoslavia, Slovenia was the westernmost and most advanced republic. With only 8% of Yugoslavia's population, Slovenia produced 20% of Yugoslavia's GDP and 29% of its exports. Its per capita GDP was double the Yugoslav average. However, despite its relative prosperity within the socialist world, at independence in 1991 Slovenia's per capita GDP was only half that of neighbouring Austria and Italy.

In a referendum in 2003, a strong majority voted for joining the EU in 2004.

Current economic performance

	<i>Slovenia</i>	<i>Estonia</i>	<i>Slovak Rep.</i>	<i>EU avg.</i>
GDP/capita, 2001, PPS (EU =100)	72	41	48	100
Real GDP growth rate, 1997-2001	4.2%	5.2%	3.3%	2.6%
Inflation, 2001	8.6%	5.6%	12.3% ^a	2.2%
Unemployment 2001	5.7%	12.4%	19.4%	7.4%

^a 2000

Source: European Commission

Table 3

Macroeconomic performance
Slovenia, Estonia, the Slovak Republic, and EU average (2001)

Since independence, Slovenia has continued to perform well (see Table 3). Compared to other transition economies, GDP growth is high and inflation is under control.

In some aspects Slovenia has already surpassed some EU members. GDP per capita is higher than in Greece and Portugal, and it continues to rise at a higher pace than the EU average. With this track record, it is with some confidence that Slovenia is now entering the EU. The benchmark is no longer how Slovenia performs in relation to the other new member states, but how many years it will take to reach the EU average.

The Yugoslavian legacy

Although Slovenians have irrevocably put their socialist days behind them, the legacy of that system still affects Slovenia's business climate and culture.

A profound influence of the Yugoslavian era was the trade pattern it created. Yugoslavian companies were organised into conglomerates. These alliances were often created by political decisions and therefore contained unrelated activities. At independence, Slovenian companies found that the Yugoslavian market was closed to them, and this market had accounted for 82% of their sales. In addition, through the break-up of the conglomerates they lost their access to specialised foreign trade companies. This crisis forced Slovenian companies to shift their trade focus westward to the EU. With their strong manufacturing base, they typically played the role of component suppliers to German and other OEMs.

There is also a cultural legacy visible in today's Slovenia. The Yugoslavian system left behind a deep distrust of government attempts to organise the economy. There are not many industry organisations or other institutions that can provide a forum for cooperation and serve as "glue" within industries. The traditional forum has been the Chambers of Commerce, in which membership is mandatory, but they typically do not play an important role as a vehicle for developing an industry. In a few cases, though, the Chambers of Commerce have served as incubators for emerging industry associations.

Another atavistic phenomenon in Slovenia is the tendency to have two jobs, one official and one un-official. This tradition goes back a long time in history. A worker would work day-time in a factory, and then go home and work on the farm or in the craft sector. This was a way for workers to supplement their income, but in the modern economy this has slowed down development. The less demanding the official jobs

are, the more time individuals have to work in the grey sector. Slovenian entrepreneurship is often on a small, cottage-industry scale.

Companies generally still operate within their narrowly defined businesses and very few new product lines have been introduced. The situation is compounded by the fact that most managers are operating in communities where they were born. Aggressive restructuring not only risks their standing within their enterprise, but also their respect in the community.

Clusters and business environment quality

There are several weak areas in Slovenia's microeconomic business environment.

<i>(Scale: 1-7)</i>	<i>Slovenia</i>	<i>Estonia</i>	<i>Slovak Rep.</i>	<i>Austria</i>
State of cluster development	2.4	2.7	3.0	4.4
Venture capital availability	2.9	3.5	2.8	4.1
University/industry research collaboration	3.8	4.1	4.6	5.1
Intensity of local competition	5.0	5.6	5.2	5.8
Public trust of politicians	3.0	2.8	2.8	4.0
Gov't honours commitm. of prev. regimes	4.5	4.8	4.0	5.7
Time to start a firm (days)	60	30	30	35

Source: World Economic Forum, The Global Competitiveness Report 2001-2002

Table 4

Microeconomic performance
Slovenia, Estonia, the Slovak Republic, and Austria (2001-2002)

On the whole, clusters have not developed far in Slovenia. Venture capital is scarce and research collaboration between universities and industry is not well-developed. The level of local competition is comparatively low. Trust in politicians is lacking, and there are doubts regarding how far new governments honour the contractual commitments and obligations of previous regimes. Red-tape when starting a new firm is considerable (see Table 4). However, Slovenia performs well in many ways that are important for innovation. (See Table 5 below.)

<i>(% of EU average)</i>	<i>Slovenia</i>	<i>Estonia</i>	<i>Slovak Rep.</i>
Internet access	96%	96%	53%
Public R&D spending	102%	79%	36%
Business R&D spending	65%	12%	35%
Employment, high-tech manufacturing	115%	63%	89%

Source: European Commission

Table 5

Innovation environment
Slovenia, Estonia, the Slovak Republic (2001)

Internet penetration is close to EU average. Public spending on R&D is slightly above EU average, but business R&D lags behind considerably. Employment in high-tech manufacturing is well above EU average.

Economic policy strategy

One of the first steps in reforming Slovenia's economy was to break up the conglomerates and privatise the component companies. Shares were typically allocated to a mix of funds and employees. The state controlled funds do not play active roles as owners, and the employee shares were usually consolidated in what in effect became employee or management buy-outs. This, in combination with strong labour unions and job security laws, gives employees considerable influence on company governance.

Slovenia's official efforts to attract foreign direct investment (FDI) are modest and not co-ordinated with other economic policies. At just above 1% of GDP during the second half of the 1990s, the level of FDI in Slovenia is alarmingly low. The low level of FDI has partly been due to the policy choice to use management and employee

buy-outs as the primary vehicles for privatising socially-owned enterprises. With the stake of strategic investors at a mere 2.3% of privatised enterprises, Slovenia has forgone the funds and expertise foreign investors could bring.

Venture capital has been slow to develop in Slovenia. There is only a handful of venture capital funds and their portfolios are small. The entry of more funds has been limited by restrictions in investment policy regulations faced by banks, pension funds and insurance companies. There are no attractive tax incentives for investors and in fact, investors are subject to double taxation in Slovenia and there is an unfavourable long-term capital gains tax rate for venture capital funds. Attempts at developing angel funds have not been successful because Slovenian entrepreneurs are often suspicious of capitalist partners and do not want to lose control of their companies.

Despite an anti-bureaucracy program instituted, the actual processes for registering companies and hiring employees (especially foreigners) often remains cumbersome. Local officials often have a mindset against entrepreneurship and there are concerns about the resulting break-down of entrepreneurial spirit and enthusiasm.

Cluster initiatives in Slovenia

In 2002, the Ministry of the Economy launched a five-year plan for promoting entrepreneurship and increasing competitiveness. On a broad level, the plan consists primarily of co-financing programs targeting three areas: improving technical knowledge in industry, promoting entrepreneurship and enhancing firm-level competitiveness.

The knowledge development component focuses on improving the flow of knowledge between educational and research institutions and industry. Measures include support for firms employing junior researchers; universities and public research institutes establishing business incubators; and firms providing equipment to research organisations for joint R&D projects.

The entrepreneurship measures aim to develop a supportive environment for entrepreneurship as well as assist small and medium-sized enterprises directly. The government provides financial support for services required by start-ups and SMEs through incubators, technology parks and a voucher system for consultancy services. Below market-level interest rate loans are made available to high technology start-ups, investments in SMEs, and investments in less developed regions that have a high level of unemployment. Two programs focuses on promoting cooperation among tourism service providers and developing a common tourism infrastructure.

Included in the entrepreneurship support measures is a program to identify and support the development of local clusters of micro and small enterprises. The Small Business Development Centre led the program to survey potential clusters. After analysing 4,000 companies, 128 potential clusters of 6-20 small companies each were identified. Large companies were not included in this program out of concern that they would dominate the process. Typical projects include joint purchasing arrangements and developing new products together.

The programs aimed at improving the competitiveness of firms include incentives to encourage technological development and increase firm productivity. The Ministry provides co-financing for pre-competitive research activities and investments in new technologies within firms and through technology centres and technological networks.

Measures focusing on productivity improvement include co-financing for continuous improvement and production management techniques such as 20-keys, business process reengineering, balanced scorecard, total quality management and for other

services offered by “knowledge providers” including training local consultants and license fees.

Four separate measures supports linking enterprises and developing clusters. Research and development projects are co-financed through technology centres and technological networks. Another measure promotes cooperation among buyers and suppliers to increase specialisation and joint research and development projects.

The cornerstone of the strategy is the cluster development programme.

The cluster development programme

This programme began in 1999 with extensive surveys and analysis to identify networks and relationships within the economy. A Slovenian consulting firm was selected to carry out a mapping exercise of clusters in Slovenia. The survey revealed that enterprise cooperation and networking were weak and the infrastructure required to support cluster development was only beginning to emerge. The primary conclusion was that “currently there are no clusters in Slovenia.” Nevertheless, ten potential clusters were identified: electric-optical, automotive, household appliances, construction, transport, information technology, furniture, textiles, tourism and pharmaceuticals.

In early 2000, the Ministry of the Economy issued a tender, inviting prospective clusters to apply to receive government assistance for developing and implementing cluster strategies. Support for clusters was limited to three pilot projects so the Ministry could gain knowledge and experience in the area of cluster development before a large program was launched.

The selection of pilot projects that could later be utilised for validation of the concept was seen as critical. The Ministry knew that early results and support from the private sector would be the most effective endorsement of the program. Demonstrated enthusiasm and willingness to invest was an important indicator of a cluster’s potential for success. Particularly vital was the strength and importance of the core companies in each cluster. These companies should be highly successful (especially in international markets) and respected in the community. They were expected to exhibit the ability and willingness to support development in the local environment. The intent was that these companies would provide leadership to pull smaller and more sceptical companies along. It was not intended, however, that certain companies take command. Clusters that were already engaged in joint activities or projects were preferred, as they would be more likely to have quicker results that could be used to promote the program.

Applicant clusters were required to submit a detailed action plan for one year and five-year strategic plans. The vision of the project leader weighed more heavily than his/her experience. In accordance with the bottom-up philosophy, the government did not evaluate the merits of cluster vision statements. The criterion was consensus of a common vision, not the particular vision itself.

Lack of understanding of the cluster concept was recognised as a hurdle, so there were outreach and education efforts. The tender document included a description of what clusters are, why they are important and what the results can be. OECD organised seminars on clusters and a key person from each cluster participated in a committee, where the cluster concept was discussed.

The pilot initiatives

The Ministry of Economy selected three clusters to be pilot cases. Two of the identified potential clusters applied and were selected – automotive and transport. In addition, the toolmaking cluster, which was originally seen as a subset of the automotive cluster, was able to successfully distinguish itself in its application and was also selected.

The government provided financing for the pilot clusters for one year, renewable for a second year. Government pays 40% of costs related to the cluster initiative; companies contribute the remaining 60%. The main contributions from companies are in the form of labour put into the projects. There is a fixed tariff set for salary time, which is used for calculating this contribution of labour. Clusters submit budgets and documentation of all expenses.

Although the government finances the cluster initiatives, it is not directly involved in the specific planning or activities of the clusters. The process is intended to be “bottom-up,” with all authority and responsibility resting at the firm level.

Automotive Cluster of Slovenia (ACS) The Slovenian automotive industry consists of a large number of component manufacturers of various sizes. With their roots in the Yugoslavian car industry, Slovenian firms produce different types of components. They still tend to have a narrow specialisation, typically producing niche components for the German automotive industry. Virtually none of them have a domestic competitor.

Shortly after independence, companies in the automotive industry formed an association, initially to lobby the government for temporary protection from imports. The association is still active, and now operates in parallel to ACS, primarily organising export promotion activities, e.g. pooling representation at trade fairs.

In spring 2003, ACS membership included 22 company members and five research institutions and faculties. All members form an Assembly, which elects the Supervisory Board, consisting of one university or institute, two large firms, and two small firms. The organisation employs a full-time director, full-time project coordinator and part-time advisor.

The overall vision of ACS is to transform the Slovenian automotive industry into specialised system suppliers with high added value. Activities include promotion (trade shows, catalogues), supply chain development (common purchasing), infrastructure development (database for R&D activities, human resources, capacity sharing opportunities), intranet development (sharing information on technology, engineering problems, etc.), education (seminars on industry trends, inviting foreign industry speakers), and quality and business excellence development.

Toolmaking Cluster of Slovenia (TCS) During the Yugoslavian era, tool shops were usually divisions of Yugoslavian conglomerates, and produced tools and dies just for the needs of the conglomerate. At Slovenian independence, the conglomerates lost, on average, 75% of their markets, and when the conglomerates were broken up, the tool shops became independent companies. Already in the early 1990s, the newly independent companies initiated joint R&D projects, since the mostly small or medium-sized companies could not afford extensive projects on their own. In 1998, they formed a cluster organisation modelled on experiences from Spain. An ambitious and dedicated professor from the University of Maribor Faculty of Mechanical Engineering took the lead in organising the effort. When the Ministry of Economy got involved, this organisation was already operational.

Tools are primarily used in the automotive industry, and in the initial cluster-mapping phase, tools were thus assumed to be a part of the automotive cluster. However, over the years the tool industry has reached a high degree of sophistication and is now oriented towards the German and Swedish markets rather than local Slovenian suppliers, and can be viewed as a separate cluster.

The cluster is centred around three core companies with different specialisations. These three companies invited their suppliers to establish sub-networks. The three core companies and their respective sub-networks overlap in activities and relationships,

but cooperation within sub-networks is stronger than between sub-networks. A Strategic Council comprising representatives of all members sets the cluster's strategic orientation and decides about accepting new members. Representatives of the three core companies and the Faculty of Mechanical Engineering form the Steering Committee, which is responsible for the operations of the cluster. The Cluster Manager supervises the cluster projects (13 as of mid-2003) and prepares proposals for new projects, which are discussed by the Steering Committee. Once approved by the Steering Committee, the proposals are presented to the Strategic Council for authorisation.

During its first years, a key priority was to build trust. This was seen as a prerequisite for advancing from commercial cooperation to research cooperation. TCS now engages in a wide range of activities. Establishment of new firms and institutions is a major priority. The Entrepreneurial Innovation Centre, an independent non-profit organisation, has been established to support the cluster. A company has been formed to fill an identified gap in the cluster (styrofoam model production). In cooperation with the Regional Development Agency, a network of seven business incubators is being created, and TCS also hopes to be able to establish a venture capital fund. It provides education and software in the field of project management, cooperating with a cluster in Spain. Other activities include efforts to attract young people to careers in engineering.

Transport and Logistics Cluster (TLC) Slovenia is located on the historically strategic Vienna-Trieste route. The Port of Koper, which became an important maritime centre during its 500-year Venetian rule, provides a short route between the Central Europe and the Eastern Mediterranean or the Suez Canal. The industry is now dominated by five large companies: the Port of Koper (51% state-owned), Slovenian Railways (state-owned), and three logistics and freight forwarding companies, of which Intereuropa is the biggest. Unlike the other pilot clusters, there is no predecessor to the cluster initiative. There has been some tension between small and big companies, because of the uneven power relationship between them, and the monopoly position of the Port and the Railways.

In Spring 2003, 13 companies and three institutions were members of the TLC. All members form an Assembly, which meets twice a year. The Assembly elects a Steering Committee, which consists of representatives for the five large companies and one small forwarding company. The TLC employs a full-time director, who supervises the Project Coordinators, one from each member.

The primary activity of the TLC is joint promotion trips, when the cluster and its companies are presented to relevant markets, e.g. Israel, Istanbul, and Belgrade. An intranet is being developed for posting documents relating to government regulations, EU directives, etc. Other activities are spearheaded by members, primarily the Port of Koper and Intereuropa. The Port directs the development of a database for knowledge management, leads an air pollution measurement project, and is also the leader of a planned distribution centre in Koper. Intereuropa is involved in developing an on-line bidding system for logistics orders, is developing a tracking system for goods, and will be the leader for a planned distribution centre in Maribor.

Continued cluster initiatives In 2002, the Ministry issued a second tender for clusters. Out of 15 applicants, eight new clusters were selected to receive government co-financing.

Performance

For the logistics cluster, the industry's power structure has contributed to distrust between small and large members, which is hampering cooperation. The automotive

cluster, with a low level of internal competition and a history of cooperation, has experienced fewer problems in building trust, but a focus on developing system-supplier networks means that large players in the industry, who already have well-developed networks, see less reason to join.

The automotive cluster notes that key foreign-owned companies have not joined the organisation, but there is no specific plan for actively recruiting them. The tools cluster, too, lacks foreign members because there are few, if any, foreign-owned tool companies in Slovenia. TCS is actively trying to convince a foreign firm to locate a laboratory facility in Slovenia.

Both the automotive and the logistics clusters have been successful in initiating various forms of commercial cooperation, helping their members by offering improved market access. The tool cluster did not see commercial cooperation as a primary objective, but found it useful as a way to offer smaller companies a short-term reason to join.

Implications for cluster initiatives in transition economies

Transitional economies share some characteristics, that set them apart from developed economies. Some of these have a large impact on cluster initiatives. The case of Slovenia illustrates many of the factors that are particularly challenging in a transitional economy.

The importance of trust

Trust is a key success factor for CIs, but it is a commodity in short supply in many transition economies. Enthusiasm for government intervention is limited. Industry organisations have traditionally played a small role and have been more of government institutions than forums for industry cooperation. Trust, always important, becomes a key issue.

In the case of Slovenia, a striking effect was the relative ease with which the automotive and tool industries, which had begun cooperating already before the CIs were initiated, managed to join forces. Compare this to the logistics cluster (and many of the other CIs started later), where distrust and reluctance to share information were obstacles to overcome. The low level of trust in government initiatives meant that in initiating the CIs, the Ministry first had to overcome a general scepticism about government intervention. Under other circumstances, it could have been tempting to provide a blueprint for the CIs, especially in the cases where the companies were unaccustomed to cooperating, but for the Slovenian government this was not an option.

Building on strong clusters

Clusters in transitional economies are often generally weak, and there is often a lack of foreign investment.

In Slovenia, the government wisely chose to select the clusters to support based on an evaluation of the strength of the existing clusters, not on the potential attractiveness of future industries. Of the three pilot clusters, toolmaking is the most internationally competitive, and their CI is showing rapid progress. The case of Slovenia also highlights the need to coordinate CIs with efforts to promote foreign direct investment.

Another weakness in clusters in transitional economies is a low level of competition between companies. In industries where government traditionally has eliminated competition through specialisation, it can be tempting to use the CI to divide the market,

reduce competition and focus on commercial cooperation. The argument might be that the cluster is too small to have more than one player in each product segment. There is, therefore, a risk that cooperation turns into collusion.

Building a common framework

When cluster initiatives are a new phenomenon, which is typically the case in transition economies, there is great need to create understanding for the concept and to convince companies and other parties of the ideas behind them. This makes it even more important for the CIs to spend time in building a common understanding. However, the resources available to do this are limited. Because clusters initiatives are a new phenomenon, there are few government officials and few consultants with experience in this area.

Here the individual clusterpreneurs can play a key role. A well-connected and respected facilitator can more easily and more quickly build the trust, understanding, and consensus needed to lead the CI in the right direction. Without such a clusterpreneur, the CI may miss the key points and settle for commercial cooperation and other short-term agendas, which are less likely to improve the dynamism of the cluster.

Entrepreneurship

CIs can help clusters grow by promoting firm formation and spin-offs. However, in transitional economies, there are often many obstacles hindering entrepreneurship. Ineffective financial markets, lack of venture capital, red tape and a generally negative attitude toward entrepreneurship, are problems that need to be addressed. CIs launched in isolation without supporting reforms in other areas will be less successful.

In Slovenia, there is a range of obstacles against entrepreneurship. In addition to the long-time tradition of “cottage industries,” with a small-scale “garage” mindset, where industries fail to grow to medium-sized and eventually large companies, an entrepreneur has the lack of venture capital and bureaucracy in setting up a new company to consider.

Is government really committed?

In transitional economies there is often doubts about the longevity of government initiatives. This reduces the trust in government commitment, which is one important prerequisite for CI success.

One recurring concern voiced by interviewees in Slovenia was regarding the long-term commitment of the Slovenian government and how to secure financing. Are the CIs just a government fad? If there is a change of government, will the programme be abandoned? Such concerns are fueled by the apparent lack of involvement from other government departments, such as the Department of Education. While clusters are a key concern for the Minister of Economy personally, the same commitment is not visible in other parts of the government.

One effect can be that CIs, fearing an end to government support, will seek to deliver short-term benefits for their members, in order to secure financing through membership fees. The risk is that long-term objectives, like increasing innovation or firm formation, are overshadowed by commercial cooperation.

Cluster initiatives for a new era

Cluster initiatives, the organised efforts to improve growth and competitiveness of clusters, are in many countries becoming an important way to structure economic policy and strengthen ties between industry, government and academia. But policy-makers are often faced with a lack of systematic evidence and structured thinking about the factors that distinguish successful cluster initiatives from failures. The current analysis, based on close to 250 surveys of cluster initiatives and a significant number of in-depth cluster studies, in both developed and transition countries, is part of a number of efforts to fill this void.



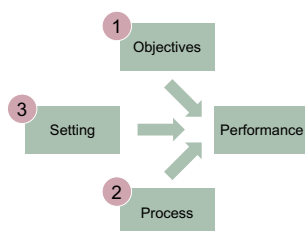
Figure 66
The three partners in a CI

A cluster initiative is an innovative way to organise cluster firms, government and/or the research community in order to coordinate the prioritisation and implementation of policies and strategies for cluster competitiveness upgrading. Cluster initiatives are the “lubricant” that allows the “engine” of cluster dynamics to operate at higher speed. Cluster initiatives can only play this new role if they succeed in defining new roles for the large number of private and public sector institutions relevant for competitiveness, and through the creation of structures that can secure continuity over the long-term horizon required for competitiveness upgrading.

Emerging from the data is an encouraging picture: many cluster initiatives are perceived to generate a positive impact; more than 80% of respondents agree that the CI has improved the competitiveness of their cluster. While the responses in this survey might be biased towards successful cluster initiatives, this is still an impressive share. The discussion has shifted from whether a cluster initiative is useful to how it should be done.

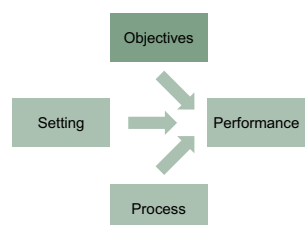
But the data also shows signs of fragility beyond the surface of many cluster initiatives. Many initiatives are dependent on public sector financing and struggle to become self-reliant. Many initiatives are also dependent on a few, sometimes only one, key individuals that are dedicated to the success and future of the cluster initiative. These weaknesses are indicators of critical challenges that cluster initiatives have to overcome to achieve a new level of effectiveness.

The evidence presented in this report points to three broad issues that cluster initiative practitioners need to address. First, cluster initiatives need a clear strategy for se-



lecting their objectives and monitoring the impact the CI achieves over time (1). Second, cluster initiatives need to develop their organisational and operational approach by combining generic elements all successful CIs apply with unique elements reflecting a cluster initiative's specific context (2). And third, cluster initiatives have to be embedded in broader efforts in upgrading the microeconomic business environment to develop their full potential (3).

Setting objectives and monitoring performance



The cluster initiatives we studied differ widely in the number of objectives they have set out to achieve. Typically both new and established CIs work in four or five of the six segments of the Cluster Target Board (see Chapter 3). We have not found any typical path or trajectory where CIs move from more simple to more complex tasks or from a narrow set of objectives to a broader one.

Cluster initiatives are defined by their purpose, upgrading the competitiveness of a regional cluster and the actors involved, not by the types of policy tools used. This openness towards many different objectives and activities structurally differentiates cluster initiatives from other institutions defined by their responsibility for a particular set of tools. And it creates a unique challenge that cluster initiatives have to master: It is often not self-evident at the outset which objectives the cluster initiative should concentrate on in order to achieve the highest impact. For competitiveness, everything matters!

Setting objectives in cluster initiatives

Identifying the right objectives and the activities with the highest impact on improving a cluster's competitiveness is the first challenge a cluster initiative is facing. Our analysis clearly indicates that there is no one list of objectives and activities to reach them that is appropriate. The selection of activities is truly context-dependent and unique for each cluster initiative.

Many cluster initiatives therefore start with an effort to analyse the clusters current profile and competitiveness. Based on this analysis, priorities for action are identified that define the scope of the cluster initiative's activities. The analysis is often undertaken with external support, for example specialised consultants or academic institutions. Cluster participants themselves often do not have the time or the experience to undertake the analysis, so there are clear advantages of bringing in external know-how. Many academics and consultants have become skilled in collecting the relevant data and organising a process to identify priorities for action based on the analysis.

In order for CIs to perform well, the analysis needs to be based upon a clear and explicit conceptual framework. All CI members should be informed about this framework to understand the basis for selecting specific objectives and activities.

While many cluster initiatives do conduct an analysis of their cluster's competitiveness position, there are still many others that do not. They define *a priori* the issues that needs to be addressed, for example raising the profile of a regional cluster by PR activities. Picking objectives *ad hoc*, however, the initiatives might not focus on areas with the highest leverage and thus achieve less impact on cluster competitiveness. Over time a lack of analysis guiding activity choices can easily lead initiatives to pursue a portfolio of objectives that is either too narrow to have impact or is too broad to have overall direction.

Even if a competitiveness analysis is conducted at the outset of a cluster initiative, it can be a challenge to apply the findings productively. There is a tendency to use the

results of the analysis to prove the strengths of a regional cluster rather than to use it as a guide to improve its position. While creating awareness about a cluster – both among its participants and to outside investors – is important, there is more important potential in using research to structure the portfolio of activities a cluster initiative pursues.

Measuring the success of cluster initiative activities

The ability to measure and document the impact of its activities plays an increasingly critical role for successful cluster initiatives. To get this type of success control right is a complex task: Higher competitiveness take a significant time first to materialise and then to translate into higher economic performance. And higher competitiveness depends on the complex interaction among many different elements. Cluster initiatives need to resort to a system of performance indicators that maps both the implementation and the impact of their activities over time. More than two-thirds of the cluster initiatives we surveyed do indeed have quantified targets along these lines.

Clear performance data is important for the supporters of the cluster initiative. Institutions financing the initiative, whether they are government agencies or private companies, need to be convinced that their money is being used efficiently. And private companies investing funds, in addition to their time and energy, need to see that the activities do improve the competitiveness of the cluster environment in which they operate. Performance data is also important for the internal steering of the cluster initiative, because it allows the initiative to check its focus on critical activities and to develop its portfolio of activities in a productive way.

Ideally, the measurement of a cluster initiative's success is an integral part of an ongoing effort to track the cluster's competitiveness. Cluster initiatives that have failed to launch an initial competitiveness assessment or that have used the results of the analysis mainly as a marketing device will again fair poorly.

Organising the CI process over time

The cluster initiatives we have studied are organised in many different ways, and stand at different stages in their development. We find that successful cluster initiatives combine key generic learnings about CIs with unique elements that are highly context-dependent. We organise our generic learnings around the development of CIs over time, and the structures supporting their efforts.

Development of cluster initiatives over time

The evolution of a CI involves antecedence, a CI formation stage, and the development of the initiative once it is launched. Some CIs will develop into a more institutionalised form and become a regular institution for collaboration (IFC). Every CI is unique, building on local resources and adapted to local norms and institutions. Its success

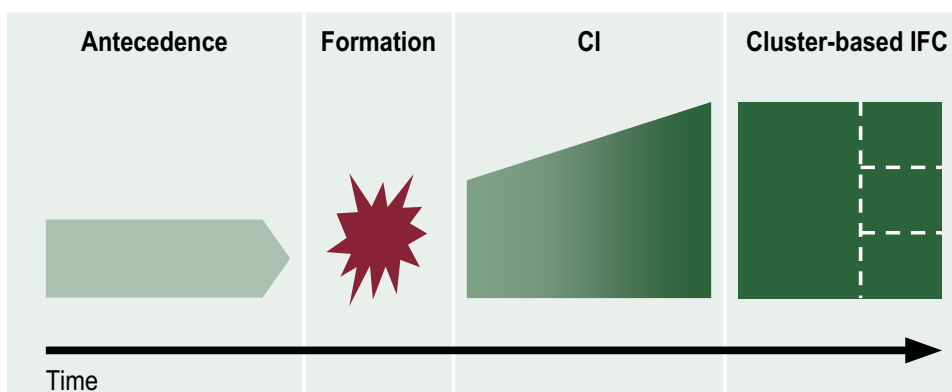
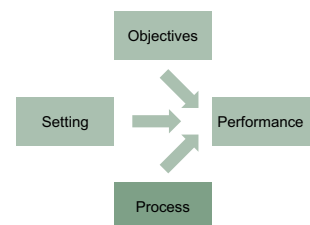


Figure 67
The cluster initiative lifecycle

depends on how it manages the specific challenges different phases of its development pose.

The analysis – action divide The differences between two very different phases of the CI evolution – setting priorities on what to do and implementing the action initiatives identified – create a unique challenge with which many cluster initiatives struggle. The two phases require different skills, different levels of engagement from cluster participants, and different working models.

The main challenge in moving from the analysis to the implementation stage is the different composition of people that need to be involved. The consultants that supported the analysis often do not have the detailed knowledge required to develop specific solutions to a cluster's problems. The cluster participants, however, often have left the analysis to the consultants and thus have little stake in its results. They need to be engaged more deeply, which requires a new organisational set-up for the initiative. They also need to be fully comfortable with the priorities identified. Creating this level of 'ownership' requires the initiation phase to be as inclusive as possible.

While these issues are well understood by many practitioners, they still remain without a simple, generic solution and shifting from analysis to action continues to be fraught with problems. Successful cluster initiatives are often created on the foundations of failed earlier attempts that did not manage to move beyond the analysis stage, but prepared the groundwork for a new type of thinking in and about the cluster.

Some cluster initiatives try to avoid these transition problems by jumping directly to developing action initiatives. But as discussed above, there is no certainty that the issues addressed are indeed the ones critical for the cluster's progress. Cluster initiatives with the ambition to have a sustained impact on cluster competitiveness cannot dispense with a hard look at their competitive position.

From project towards an IFC Cluster initiatives often start out as a project to address a specific problem. They might work on improving the curriculum at a local university or develop a marketing campaign to raise the public awareness of their cluster. Over time, however, the project structure has to transition to a more permanent organisational form. In the data, for example, we see a clear shift towards private sector financing, as cluster initiatives get older.

Several types of new institutions are being used in cluster initiatives that have made the transition to a permanent existence. Some of these institutions resemble trade associations. But they tend to have a wider membership including all of the related industries and other institutions that make up a cluster. They also tend to have a somewhat wider field of activities than trade associations that extends more into direct commercial interaction between companies in the cluster. Other types of new institutions focus on the generation of data and knowledge about the cluster. They resemble economic research institutes, tracking the competitiveness of the cluster and writing reports on specific issues important to the cluster. But they also get involved in supporting action initiatives to address the issues identified.

The new types of institutions are only just emerging; only few cluster initiatives have been around for long enough to make their creation a central concern. But it is increasingly realised that long-term efforts need to be pursued in long-term organisational structures. Competitiveness is a long-term issue that cannot be addressed in meaningful way in short projects.

Creating successful structures for cluster upgrading

Cluster initiatives are an innovative way to organise a broad set of cluster participants in a joint effort to coordinate the prioritisation and implementation of policies for cluster competitiveness upgrading. Cluster initiatives do not create new policy areas,

but activate and package existing policy areas to achieve maximum impact on the particular challenges facing a cluster. Cluster initiatives can only play this new role if they succeed in defining new structures that integrate the capabilities of cluster participants in a productive way.

New roles of private and public sector Cluster initiatives are branching out across the traditional dividing lines between the private and public sector. In the old model of economic development, government was responsible for the business environment context while companies were responsible to compete given this context. In the emerging model of economic development where economic success depends on much more specialised qualities of the context, this clear division is no longer appropriate. The public sector lacks the knowledge to understand the priorities for individual clusters and it lacks the policy instruments to implement all necessary actions. The private sector, however, is not organised to engage in joint efforts in business environment upgrading and it, too, has control only over a subset of the relevant policy areas.

In the data, we see clear evidence of the struggle to identify roles for the public and private sector that are more appropriate given the realities of modern competition. The public sector has clearly seized upon cluster initiatives as a new way to organise cluster policy, and is willing to provide some – often the majority – of funding. The private sector often takes an important role in joint cluster initiatives with the public sector but it remains wary of the role of the public sector. Some companies also find it hard to accept the new responsibility for their business environment in addition to their traditional role in setting company strategy. These challenges are especially apparent in cluster initiatives that lack strong anchor companies or are the result of company initiatives.

Successful cluster initiatives define clear roles for private and public sector participants. Private sector participants have to learn that involvement in cluster initiatives is not a matter of good corporate citizenship but plain good business sense. Successful companies thrive in strong clusters – more so now than in the past. Public sector participants have to learn to be active participants in cluster initiatives without becoming over-responsible for all activities and outcomes. Beyond these broad guidelines, appropriate structures for private-public cooperation depend very much on the unique conditions in a particular cluster.

Cluster initiative facilitator In many clusters, there are a few – sometimes only one – individual(s) that carry the momentum of the cluster initiative. These individuals tend to have significant inside knowledge about the cluster including an extensive network of contacts. They provide the continuity necessary to lead cluster initiatives through different phases and through different “generations” of leaders involved from the private and public sector.

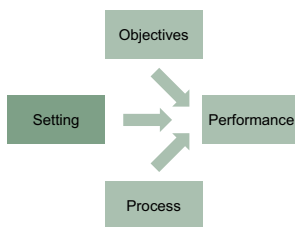
In the data, we see that while in many CIs, cluster initiative facilitators are a critical positive factor, they can also be one of their most important weaknesses. Cluster initiatives can become overly reliant on the individual rather than on the position that s/he fills. And cluster initiatives can become seen as owned by the individual facilitator rather than by the whole cluster. In the worst case, this can lead to disengagement by cluster participants and a high level of fragility for the cluster initiative.

Cluster initiative facilitators need to develop their role to a more professional style of organisational leadership. They will, as individuals, always be in a special role as the face of the cluster that symbolises joint efforts and interests both externally and internally. But they need to create the structures and the organisational climate that emancipates

the institution from the individual, for example by creating a strong supervisory board and a leadership tightly involved in the operations of the cluster initiative.

Cluster initiative members Cluster initiatives are engines to achieve economic prosperity for their region; this broad goal gives them public legitimacy and allows the public sector to be involved. To achieve this goal, CIs need to look beyond the short-term interests of their current members and include the interest of potential future members, such as foreign investors and newly started companies. More current cluster participants need to realise that company formation and investment from outside the region are not only a sign of a cluster's attractiveness but can also improve the competitiveness of the existing businesses. There seems to be an ambiguity between the clear benefits seen from attracting missing specialised suppliers or service providers, and the dangers from more intense rivalry among higher numbers of locally present competitors. Cluster initiatives need to overcome this ambiguity, otherwise they are going to miss out on the large potential of attracting external know-how and ideas.

Integrating cluster initiatives in a broader microeconomic policy agenda



Cluster initiatives can increase their impact by selecting the appropriate objectives, monitor them and create a process that can help them to achieve their goals. But cluster initiatives also depend on the wider microeconomic policy environment of which they are a part. Only if they are integrated in broader efforts to upgrade the regional (and sometimes national) microeconomic business environment can they reach their full potential for their cluster and achieve meaningful impact on a region's (or nations) economic performance.

In the data, we see an important relationship between successful CIs and strong general business environments, including high trust in government initiatives, influential local government and strong clusters. In a strong business environment, cluster initiatives can clearly provide “lubrication” to the cluster. In a weak general business environment CIs must be complemented with a range of policies to upgrade the microeconomic business environment (including competition policy, deregulation, FDI policy, education and science policy).

The quality of a cluster's business environment is determined by the cluster diamond and by factors that affect all or many parts of the regional economy. To address both sets of factors, cluster initiatives can be supported by a set of initiatives on cross-cluster issues, such as public education or infrastructure. Or the individual cluster initiative can be used as a fact-finding mission that identifies areas that need to be improved for the overall business environment to achieve higher levels of performance. Cluster initiatives that are not integrated in broader regional efforts, and regional competitiveness initiatives that lack a cluster focus, fail to reach their full potential. This is especially true in developing and transition nations.

Cluster selection in regional competitiveness initiatives

Regional (or national) competitiveness initiatives often address a number of clusters as well as a number of cross-cluster issues. How to select the right clusters often becomes a critical issue in such initiatives. First, clusters should be selected to leverage existing activities and business environment strengths. Alternative approaches that put much emphasis on identifying international markets that seem promising often fail, because they do not take into account the competition from other locations better positioned to serve these markets. Second, the structures for launching cluster initiatives should be

open to all clusters that can prove the ability and willingness to upgrade. A process of competition should be applied. Available resources need to be focused on the most promising clusters to achieve impact, but this selection process should sequence cluster initiatives rather than ultimately determine which cluster initiatives will be supported. Third, the parallel upgrading of the general business environment provides support to all clusters, so that all companies can benefit from a regional competitiveness initiative and have an incentive to participate.

It is encouraging that in the data we already see a clear tendency for many cluster initiatives to occur in a policy environment where such cluster efforts are welcomed and encouraged. But cluster initiatives alone, even if pursued on a broad level, are no substitute for a thorough assessment of crosscutting microeconomic policy issues, such as general education, the marketing of a region, or infrastructure issues.

Cluster initiatives entering a new era

Cluster initiatives have the potential to become critical elements in the institutional toolbox for economic development in the 21st century. They are critical to address the microeconomic determinants of economic performance that become increasingly powerful as the well-known differences in macroeconomic conditions, basic legal and political institutions, and market access across countries and regions are fading away.

Cluster initiatives are a new way to organise microeconomic policies; they are not new policies. CIs draw upon many existing policies, and their main contribution is to select, adapt, and combine policy measures to maximise the impact on cluster competitiveness given the specific conditions a cluster is facing.

Cluster initiatives have already come a long way from their *ad hoc* beginnings in the 1980s and 1990s. To further increase their impact, practitioners in CIs have to find answers to strike the right balance between locally created models and international best practice, in order to build a successful CI process. Furthermore, they need to integrate their activities in any cluster initiative with the broader microeconomic agenda, cutting across clusters. None of these challenges are trivial, but solving them offers a huge reward in terms of the capacity to generate sustainable increases in economic performance through cluster growth and competitiveness.

This Greenbook is an initial attempt to rationalise the debate on CIs by providing not only a conceptual framework, but also some systematic evidence that goes beyond a small number of case studies. More such data is necessary, and now when there are a number of comparative datasets on country and regional competitiveness, we hope there will soon be a number of datasets on cluster competitiveness and best practices among cluster initiatives.

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Cluster initiative cases

ACStyria Autocluster	Austria
Aerospace Component Manufacturers	U.S.A.
Aluminiumriket (aluminium)	Sweden
Austrian Food	Austria
CITER, Emilia Romagna (textiles)	Italy
CITI, Western Cape Province (IT)	South Africa
Consumer Electronics, Catalonia	Spain
Flanders Multimedia Valley	Belgium
Fuel Cells Canada	Canada
IDEA Plant (information design)	Sweden
Lettmetall (light metals)	Norway
Manawatu IT Cluster	New Zealand
Mat fra Trøndelag (food)	Norway
Materials Valley	Germany
Medilink East	U.K.
North Carolina Biotech Center	U.S.A.
PANAC (automotive suppliers)	Hungary
Rochester Regional Photonics Cluster	U.S.A.
Rotterdam Audio Visual/Film Cluster	Netherlands
Scotland's digital media and creative industries	U.K.
Scottish Forest Industry Cluster	U.K.
Sultanahmet (tourism)	Turkey
Vlaams Software Platform	Belgium
Öresund IT Academy	Sweden–Denmark

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Dr Sölvell has published extensively in the areas of Clusters, Competitiveness and Multinational corporations. The concept of clusters and the diamond model was launched in Sweden in 1991 through *Advantage Sweden* (Norstedts) written together with Michael E. Porter and Ivo Zander. Recent works on clusters include *Microcompetitiveness of Wireless Valley*, published with Michael E Porter and Ivo Zander (Invest in Sweden Agency, ISA, 2000), and *kluster.se* (SNS 2001).

Dr Sölvell was one of the founders of the consulting group Ivory Tower in 1987.



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Göran Lindqvist has a background as a strategy consultant at the international firm Monitor Group (founded by Harvard professors Michael E. Porter and Mark Fuller). At Monitor he conducted analysis of clusters and country competitiveness. He also has extensive experience in company strategy and market analysis.

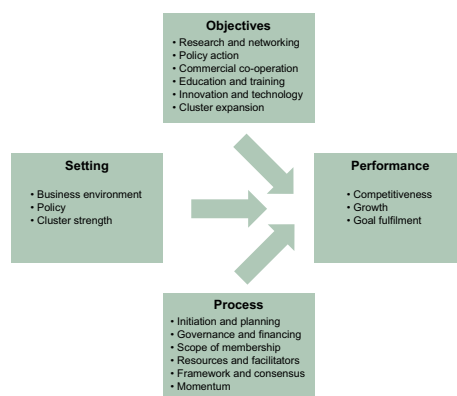
He is now CEO of the cluster research and education group Ivory Tower, where he has performed cluster related studies for Swedish government agencies. Previous publications include *Svenska klusterkartor* (CIND, 2003) published with Örjan Sölvell and Anders Malmberg.



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The Cluster Initiative Greenbook

After Michael Porter's seminal work on clusters and competitiveness around 1990, cluster initiatives (CIs) have become a central feature of microeconomic policy around the world. CIs add a new dimension to traditional policy areas such as industrial policies, regional and SME policies, investment attraction policies, and science and innovation policies. Experimentation with new types of partnerships linking industry clusters–government–academia is now going on in developed, transition and developing countries around the world.

This Greenbook takes a closer look at CIs around the world. Built on a unique new data-set of over 250 cluster initiatives the Greenbook describes and analyses the setting in which CIs are formed, the objectives of the CIs, and the process by which CIs are formed and evolve over time. Further, the Greenbook highlights drivers of good performance.

The book reflects a shift in the policy discussion from whether a cluster initiative is useful to how it should be done. Depending on its unique context, each cluster initiative has to make a number of choices on how to organise and operate. This book presents systematic learnings that will help CI practitioners to make these choices in an informed way to become more successful.

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