Final Management Project

COMPETITIVENESS IN THE EUOPEAN UNION

IS CLUSTER COOPERATION THE RIGHT WAY TOWARDS THE FUTURE?

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Competitiveness in the European Union:

Is cluster cooperation the right way towards the future?

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All major concepts and abbreviations are defined and explained in the Glossary.

1. ABSTRACT

The severe financial and economic crisis, an increasing globalisation, growing emerging markets and an era of 'hyper-specialisation' create an environment in which the EU needs to become more competitive for the future.

The key factors for competitiveness in the long run being economic performance, R&D and innovation, clusters can play a huge role in the future. It has been observed that regions with strong clusters have recovered much faster than regions without clusters from the recent economic crisis.[1] One clear objective of the Europe 2020 strategy is the move towards world-class clusters.[2] However it is clear that one cluster will not reach enough critical mass to attain global competitiveness. By consequence cluster collaboration is essential to overcome regional boundaries and move towards world-class clusters ergo European interclusters.

Based on the results of a survey conducted among 169 actors, cluster collaboration is becoming more common but there are still many barriers in place. A recommendation made to summit many challenges would be the creation of a European Cluster Centre which would not only centralise all European cluster information but also help integrating European and regional policies and initiatives.

So cluster collaboration is certainly a good and right way towards the future even it is impossible to know if it will help to overcome all further challenges of the EU. European companies are the heart of business activity. If they are more competitive, the EU will be more competitive. By consequence clusters and cluster collaboration are a source of prosperity and could stabilise the EU against future crisis.

[1] TECHAMERICA FOUNDATION (2010), *Cybercities 2010: The definitive analysis of the high technology industry in the nation's top 60 cities*, http://www.techamericafoundation.org/cybercities (20.07.2012)

[2] EUROPEAN COMMISSION (17.10.2008), *Towards world-class clusters in the European Union: Implementing the broad-based innovation strategy*- SEC(2008) 2637

2. INTRODUCTION

An increasing dynamic globalisation and the recent crisis have changed the world's economic order and the strategic position of Europe. The recent deep financial crisis uncovered major weaknesses and the EU risks to be not competitive anymore in the future. With growing driving forces from emerging economies and only a slow recovering from the crisis, a restructuring of the EU is crucial.

It has been observed that regions with strong clusters have recovered much faster than regions without clusters from the recent economic crisis.[3] Clusters could play an essential role to increase the competitiveness of regions. As such the Europe 2020 strategy is based on 'smart, sustainable and inclusive growth' with a great importance given to the move towards world-class clusters.

One cluster alone will be unlikely to have enough weight on the international stage. As our world is moving towards an 'era of hyper specialisation' it is essential to collaborate. The EU is composed by 27 Member States with different cultures and economies creating several barriers to collaboration. Only a stronger cooperation and economic links between EU countries and a high level of innovation will enable the EU to recover and come out stronger.

This project will analyse not only clusters but more specifically the collaboration of clusters in the European Union and the question if that is the right way towards the future. Are the different Member States still isolated or is collaboration already happening? What is the EU doing to encourage innovation and facilitate collaboration between clusters? Are world-class clusters ergo interclusters emerging in the EU and is cluster collaboration really creating a comparative advantage?

This subject is worth analysing as for the first time in history cluster theory is not only tested on a single country but on a Union of 27 different countries, elevating cluster theory on a much larger scale. Moreover cluster collaboration and its impact on competitiveness has not yet been analysed in theory. If this project shows that cluster collaboration is happening and creating a huge competitive advantage, the European Union could have found a way to compete against rising emerging economies in the future and stabilise against future crisis. The question is however if there are not too many challenges to overcome and if cluster collaboration is really the right way towards a more competitive future in the EU.

[3] TECHAMERICA FOUNDATION (2010), *Cybercities 2010: The definitive analysis of the high technology industry in the nation's top 60 cities*, http://www.techamericafoundation.org/cybercities (20.07.2012)

3. LITERATURE REVIEW ON CLUSTERS

Clusters have existed for centuries. However they were more commonly known in the form of geographic concentrations of trade, such as in big cities or on major transport routes. Their role was very limited and the term cluster has only been used much later.

Alfred Marshall commented in 1890 in his 'Principles of Economics'[4] on the externalities of specialized industrial locations and **Schumpeter** (1939) referred to 'swarming' or clustering of industry. The first one to use however the term of 'business cluster' was **Michael E. Porter** in the 1980's.

3.1. Definition of clusters and cluster theory

Michael E. Porter was analysing at the Harvard Business School why some firms were building globally leading positions in certain regions and why other companies developed less in other regions. So he developed the Diamond Model[5] which shows the competitive advantage of firms in finding better and new ways to compete in an industry.

Clusters have been defined as a 'geographically proximate group of interconnected companies and associates institutions in a particular field, linked by commonalities and complementarities.'[6] Porter (1990)

Paul Krugman (1991) saw clusters not 'as fixed flows of goods and services, but rather as dynamic arrangements based on knowledge creation, increasing returns'[7]

Malmberg, Sölvell and Zander (1996) differentiated between four types of economic agglomeration (*Appendix 11.1- Figure A)* and demonstrated that 'regional clusters are limited geographical areas with relatively large number of firms and employees within a small number of related industrial sectors'.[8]

A newer definition has been made by the **Expert group on Enterprise Clusters and Networks** (2003) which was saying that 'clusters are groups of independent companies and associates institutions that are:

- Collaborating and competing,
- Geographically concentrated in one or several regions, even though the cluster may have global extensions,
- Specialised in a particular field, linked by common technologies and skills,
- Either science-based or traditional,
- Clusters can be either institutionalised (they have a proper cluster manager) or non-institutionalised.'[9]

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[4] MARSHALL A. (1929), *Principles of Economics*, Eight Edition, MacMillan, London

[5] Cf. 13. Glossary: Porter's Diamond

[6] PORTER M. (2008), *On Competition*, Harvard Business Review Book, USA, p.215

[7] SÖLVELL Ö. (2008), *Clusters- Balancing Evolutionary and Constructive Forces*, Ivory Tower Publishing, Sweden, ISBN: 978-9197478335, p.12

[8] IRE SUBGORUP REGIONAL CLUSTERING AND NETWORKING AS INNOATION DRIVERS, *Design of cluster initiative- An overview of policies and praxis in Europe*, Europe INNOVA

[9] IRE SUBGORUP REGIONAL CLUSTERING AND NETWORKING AS INNOATION DRIVERS, *Design of cluster initiative- An overview of policies and praxis in Europe*, Europe INNOVA

C**luster theory** focuses on 'how juxtaposition of economically linked firms and institutions in a specific geographic location affects competitiveness.'[10] (Porter, 2008) It relates competition theory with collaboration theory but is different from industrial policy. The latest is more focussed on returns of scale for emerging industries and eliminates competitors whereas cluster theory focuses on growth and productivity for all clusters and pushes competition.[11] The concept was new that companies could actually benefit from competitors. Clusters should highlight 'opportunities for coordination and mutual improvement in areas of common concern without threatening or distorting competition or limiting the intensity of rivalry.'[12] (Porter, 2008)

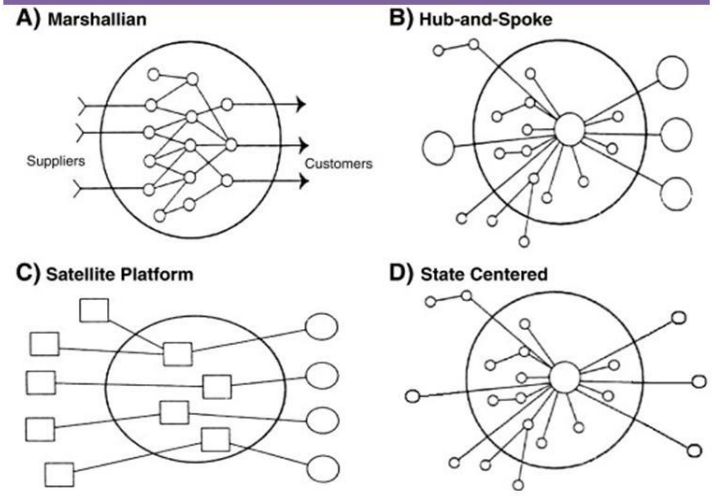
A study of the Competence Networks Germany (2009) checked over 500 articles on clusters and identified only 35 relevant articles. Three sources of literature were published before 1995 and 19 after 2000. 27 were based on empirical data and 6 on theoretically data. This study is showing a clear overall research gap on cluster theory. [13]

3.2. Cluster typology

Clusters can have several different names such as Network, Competitive pole or industrial district depending on the EU country. A full list of terms for each EU country can be found in *Appendix 11.1-Figure B.*

Markusen (1996) developed a typology on industrial districts as literature failed so far to explain why certain localities 'stick' together in 'slippery spaces'. *Figure 1* shows that the role of governmental actors and large multinational firms had been underestimated so far.[14]

Figure 1 –Typology on industrial districts



Source: HE J. & FALLAH H. (July 2011), *The typology of technology clusters and its evolution-Evidence from hi-tech industries*, Technological Forecasting and Social Change, Volume 78, Issuer 6, http://www.sciencedirect.com/science/article/pii/S0040162511000084

So clusters include different actors they bring and hold together by 'social glue'. (*Figure 2)*

[10] PORTER M. (2008), *On Competition*, Harvard Business Review Book, USA, p.242

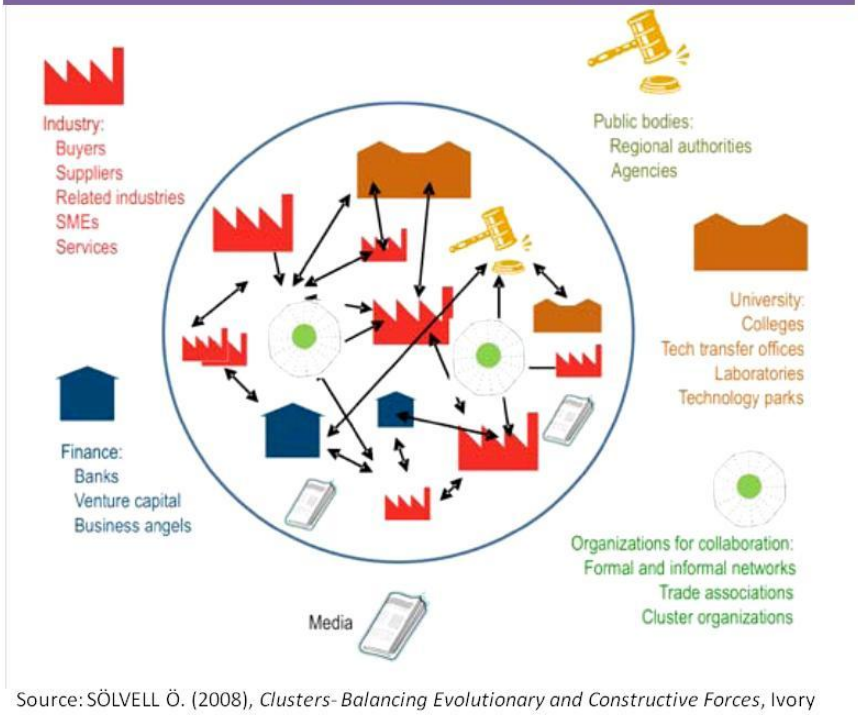
[11] PORTER M. (2008), *On Competition*, Harvard Business Review Book, USA, p.264- 265

[12] PORTER M. (2008), *On Competition*, Harvard Business Review Book, USA, p.221

[13] INSTITUTE FOR INNOVATION AND TECHNOLOGY (November 2009), *Clusters in Germany- An empirical based insight view on emergence, financing, management and competitiveness of the most innovative clusters in Germany*, 2nd edition, Kompetenznetze Deutschland

[14] OECD PUBLISHING (2005), *Business Clusters: Promoting enterprise in Central and Eastern Europe*, OECD, ISBN: 92-84007105

Figure 2 – Cluster actors



Source: SÖLVELL Ö. (2008), *Clusters- Balancing Evolutionary and Constructive Forces*, Ivory Tower Publishing, Sweden, ISBN: 978-9197478335, p. 13

The most important actor is definitely the industry which takes innovation to markets. Financial actors provide companies with the needed investments for their research, regional authorities build a framework for the cluster and organisations for collaboration link the cluster to the other actors. Media builds a brand for the cluster attracting new companies. Universities provide people with the right kind of skills and make the link between research and business. Depending on the sector, this link is however weaker. Creative industries showed no evidence of direct contributions to innovation by universities other than supplying skills. [15]

The European Competitiveness Report 2010 writes that 'more coordination is needed between research and industry, going beyond any coordination by market mechanisms. Providing incentives for networking and clustering can help to achieve this. (...) Clusters can be particularly helpful in linking research and commercial know-how, ideas and personnel between industry and research institutions should be circulated between and within Member States' [16]

However these connections in clusters often have gaps which limit their success. By working together they learn to understand each other's needs and are able to build a dynamic cluster and trust over time. As Henry Ford (1863-1947) already said 'Coming together is a beginning. Keeping together is progress. Working together is success.' [17]

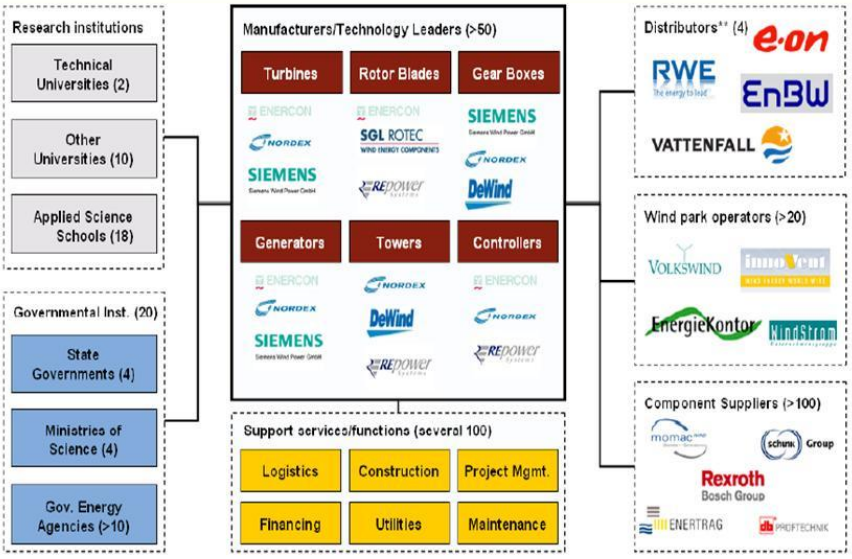
An example of a cluster structure is given on *figure 3*. In the Northwest Germany Wind Technology Cluster, 80% of all relevant actors of the cluster are located in a radius of 200 miles around the city of Bremen which enhances the 'social glue'.

[15] NESTA (November 2010), *Creative clusters and innovation- Putting creativity on the map*

[16] EUROPEAN COMMISSION (2010), *European Competitiveness report 2010*, Luxembourg, ISSN: 1682-0800

[17] KOMPETENZNETZE DEUTSCHLAND (February 2010), *Cluster Management Excellence- Volume 2: Sustainability and Effectiveness of Clusters and Networks*, Federal Ministry of Economics

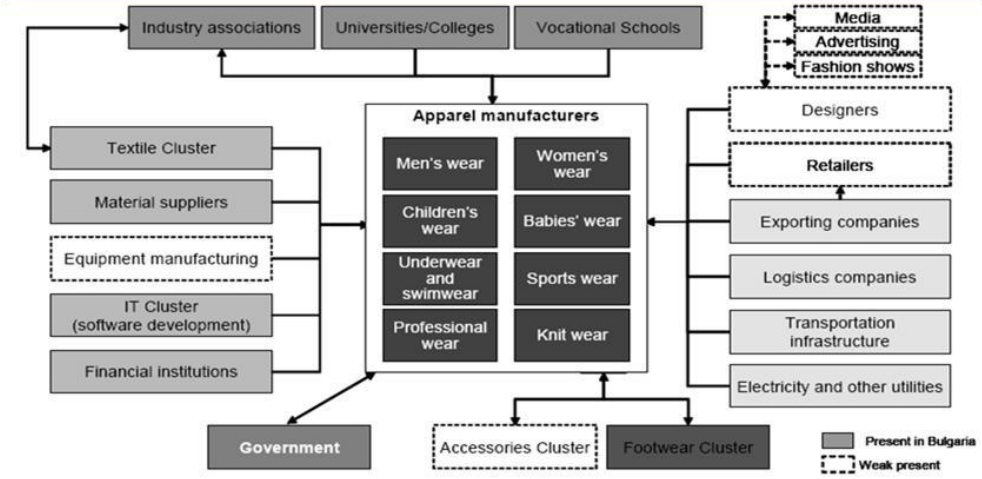
Figure 3 –Northwest Germany Wind Technology Cluster map



Source: HAVARD BUSINESS SCHOOL- INSTITUTE FOR STRATEGY AND COMPETITIVENESS (2010), *The German Wind Technology Cluster*

Some clusters involve SMEs (Italian footwear cluster) but others integrate mainly large companies (German pharmaceutical cluster). Some clusters are organised around a few key anchor firms or universities, others are distributed more equally with strong links to all firms. So boundaries of a cluster continually evolve with the firms within. *Figure 4* shows another example of an internal organisation. The Bulgarian apparel cluster includes 3000 apparel manufacturers at the core covering all major product categories and linked all together.

Figure 4 – Cluster Map of the Bulgarian Apparel cluster



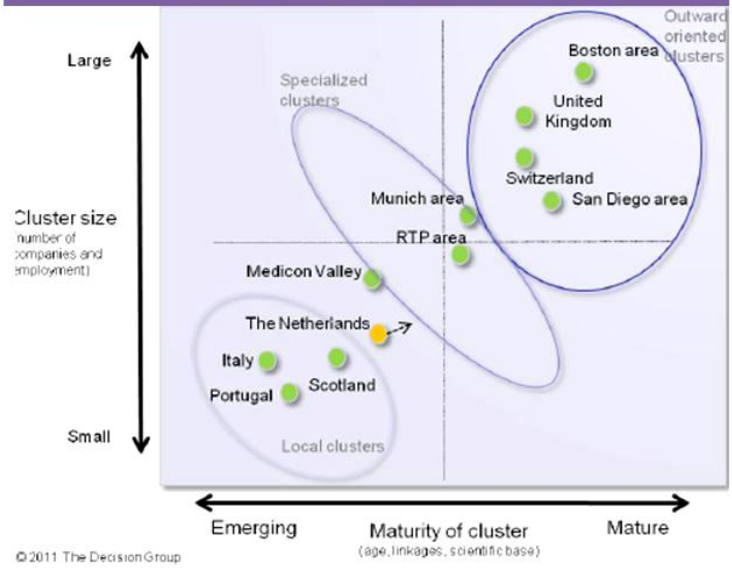
Source: HAVARD BUSINESS SCHOOL- INSTITUTE FOR STRATEGY AND COMPETITIVENESS (2007), *Bulgaria's Apparel Cluster*

Clusters are not homogenous but dynamic as they vary in nature, size and scope. Most clusters are based on vertical supply chains. Companies are not directly concurrent as they often produce or offer a complementary service which enables them to create a sustainable supply chain. More rarely are clusters in which companies cooperate horizontally as these companies are direct concurrent. This 'co-

opetition' [18] where competition and cooperation are united, is normally more common in R&D. 'Collaboration among competitors is an unnatural act- but sometimes it's the best way to reduce costs, leverage strength, accelerate scale, or amplify influence in order to generate results.' [19] (Tierney, 2011)

Clusters can also be split by their orientation. Most clusters serve the local market such in the real estate or the construction industry but the demand is evidently limited. The opposite is the outward-oriented cluster which can grow far beyond the size of the local market. *Figure 5* shows the orientation of international health clusters compared to the Dutch life sciences and health cluster.

Figure 5– Cluster orientation



Source: http://www.thedecisiongroup.nl/wp-content/uploads/2011/03/Presentation-cluster-event-23-march-2011-Fred-van-Eenennaamv2.pdf

So a cluster can range from a single city, to a region, a country or even be trans-national. However clusters are more likely to extend to proximate countries with a common language and similar legal systems.

Another dimension to separates clusters is the level of sophistication. Some cluster concentrate on the production of low-cost goods such as the automotive cluster in Dogu Marmara, Turkey, while others focus on highly differentiated products as for example the automotive cluster in southern Germany.[20]

The White paper[21] suggests to make the difference between 'area clusters' which are ecosystems alias geographic concentrations of businesses in a particular field of activity and 'power clusters' which are more like alliances of businesses and research centres coordinated by a management team.

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[18] KIESE M. & ABPLANALP P. (2010) *Kooperation und Wettbewerb in regionalen Clustern,* IO NEW MANAGEMENT Nr.11, p.16

[19] TIERNEY T. (July- August 2011), *Collaboration for the common good*, Harvard Business Review, p.38

[20] SÖLVELL Ö. (2008), *Clusters- Balancing Evolutionary and Constructive Forces*, Ivory Tower Publishing, Sweden, ISBN: 978-9197478335, p.14

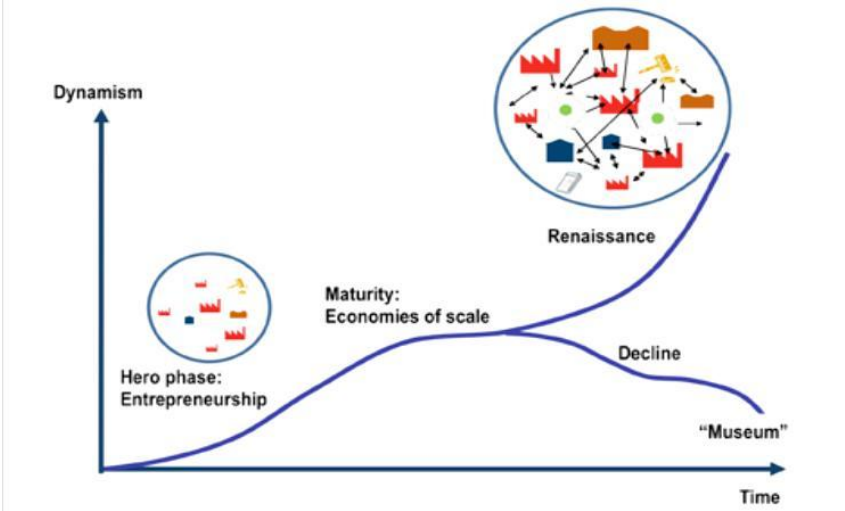
[21] EUROPA INTERCLUSTER (2010), *White Paper- The Emerging of European world-class clusters*, http://www.intercluster.eu/index.php?option=com_flexicontent&view=items&cid=1:frontpage&id=159:release-of-the-white-paper-on-the-emerging-of-world-class-clusters&Itemid=1

Enright (2000) proposes a new cluster classification according to cluster development stages. He differentiates between working clusters (well-developed), latent clusters (low level of interaction), potential clusters, policy-driven clusters and wish-full thinking clusters.[22] So clusters are also distinguished by the stage in their life cycle. It is crucial for clusters to know in which stage they are in order to adapt correctly their strategies.

3.3. Emergence, evolution and decline of clusters

Each cluster goes like a company through a specific life cycle (*figure 6)* which comprises the birth of the cluster its evolution and growth and sometimes also its decline.

Figure 6– Cluster Life Cycle



Source: SÖLVELL Ö. (2008), *Clusters- Balancing Evolutionary and Constructive Forces*, Ivory Tower Publishing, Sweden, ISBN: 978-9197478335 - The cluster life cycle, p.17

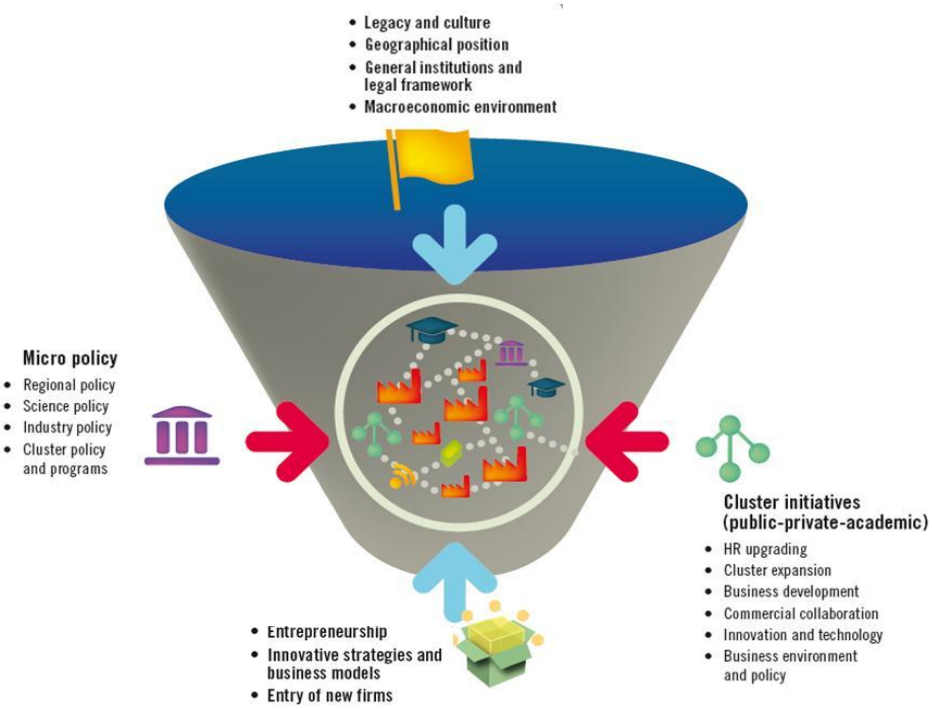
Many studies analysed the factors which encountered for the **emergence of a cluster** but there are so many that it was impossible to list them all. Many of the factors which consist in endowments for the emergence of the cluster can also be the factors which make clusters successful.

Some clusters emerge in an organic way where natural factors, access to research and universities, innovative companies, good infrastructure or a particular demand in the region play a big role. In the wine cluster in Bordeaux, France natural resources were crucial and Finland's environmental cluster arose from a local demand in the form of pollution problems created by local process industries.[23] The contrary of the organic development is the planned development in which a cluster develops mostly through policy action. It is mostly a mix of the two ways which make clusters emerge.

Clusters can also be impacted by entrepreneurs opening a particular industry in a particular region, which are than classified as the 'heroes' of the cluster. Sometimes the emergence of clusters has also to do with chance. Some clusters just emerge at the right point in time or the right location to be successful. However chance is almost never the only explanation. More often many different factors influence a cluster at the same time as shown by the funnel model in *figure 7*.

[22] OECD PUBLISHING (2005), *Business Clusters: Promoting enterprise in Central and Eastern Europe*, OECD, ISBN: 92-84007105
[23] PORTER M. (2008), *On Competition*, Harvard Business Review Book, USA, p.254

Figure 7 – Cluster funnel model



Source: EUROPE INNOVA- SÖLVELL Ö. & KETELS C. & LINDQVIST G. (2009), *EU Cluster Mapping and Strengthening Clusters in Europe*, paper n.12, Office for Official Publications of the European Communities, ISBN: 978-9279120343

Brenner & Mühlig[24] (2007) studied 159 clusters to find out three major success factors for the emergence of clusters: Prerequisites, qualified labour and strong networks between actors help in the development of the cluster. Renowned universities and public research centres were important in 70 cases. Secondly, triggering events launch the process of making use of the cluster development potential. The creation of a leading firm was considered important in 62 and special policy measures in 53 cases. Finally in self-augmenting processes most important are the accumulation of human capital (116 cases), the cooperation among firms and the choice of co-location with other firms.[25]

Generally clusters are emerging more in advanced economies, as more industries tend to be locally present and 'the relatively competitive companies in developing economies tend to operate more like islands rather than as cluster participants'[26] (Porter, 2008). Many of the factors which make clusters successful such as quality education, access to capital and inbound FDI are also missing in the developing world.

The **development of clusters** is more predictable than its birth, as it is a chain reaction following the emergence of the cluster. If the cluster develops well, often depends on the 'intensity of local

[24] BRENNER T. & MÜHLIG A.(2007), *Factors and Mechanisms Causing the Emergence of Local Industrial Clusters- A Meta-Study of 159 Cases*, The Papers on Economics and Evolution #0723, ISSN: 1430-4716 https://papers.econ.mpg.de/evo/discussionpapers/2007-23.pdf (12.07.2012)

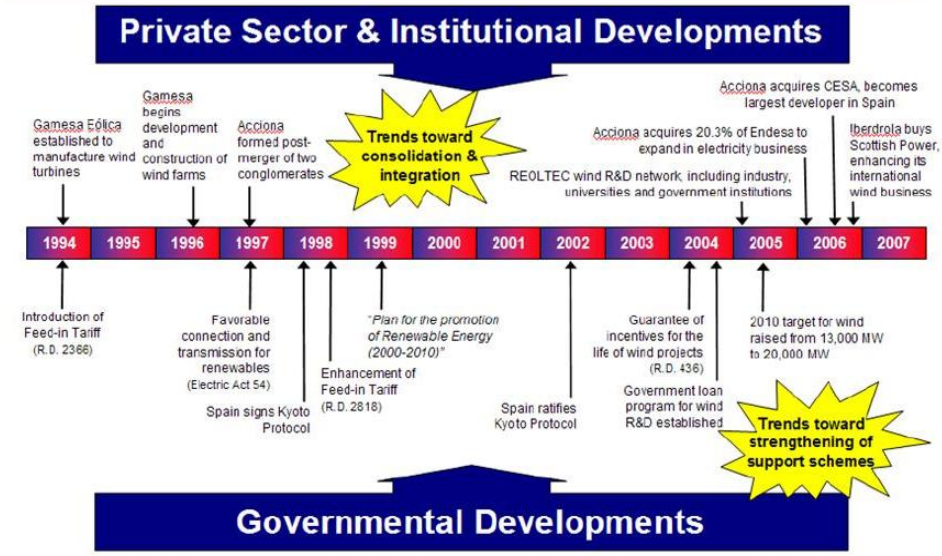
[25] BRENNER T. & MÜHLIG A. , *Factors and Mechanisms Causing the Emergence of Local Industrial Clusters- A Meta-Study of 159 Cases*, The Papers on Economics and Evolution #0723, ISSN: 1430-4716 https://papers.econ.mpg.de/evo/discussionpapers/2007-23.pdf (12.07.2012)

[26] PORTER M. (2008), *On Competition*, Harvard Business Review Book, USA, p.247

competition, the location's overall environment for new business formation, and the efficacy of formal and informal mechanism for bringing cluster participants together.'[27] (Porter, 2008)

An example of a cluster development is given by the Spanish Wind technology cluster (*figure 8*). Spanish tariffs for wind power as well as continuous support by the government helped the cluster to develop and generating over 31600 jobs in 2007.

Figure 8 – Evolution of the Spanish Wind technology cluster



Source: PORTER M. (2008), *On Competition*, Harvard Business Review Book, USA, p.241

Some success factors are rivalry between companies, entrepreneurship, good infrastructure, access to enabling technologies, access to specialised inputs and employees, access to information, incentives and performance measurement and access to finance. However one of the most important factors is based on the social structure of the cluster such as the free flow of information and the value- adding exchanges and transactions in the cluster. As clusters advantages rely on their connections and linkages with others, relationship building is one of the most important mechanism for a cluster. 'Social glue binds clusters together, contributing to the value creation process.'[28] (Porter, 2008)

All four drivers of Porter's diamond begin to interact and create social capital in the development of the cluster. Often cluster organisations representing most members of the cluster are created as a bigger group of firms can lobby government identify common needs and most importantly trade associations institutionalize these cluster linkages. When clusters grow they intersect also at some point with some other clusters which is particularly vibrant as new companies can emerge from these combinations. Often big cities such as London have several clusters which benefit from interactions. Growing clusters also attract more and more FDI and expertise. So clusters must try to reach out to international markets because only this is enabling a circulation of skills, ideas and resources.

[27] PORTER M. (2008), *On Competition*, Harvard Business Review Book, USA, p.256
[28] PORTER M. (2008), *On Competition*, Harvard Business Review Book, USA, p.241

As clusters are not stable over time they can also change in their development. The UK Humber seafood cluster transformed from a commodity producer into a leading value-added fresh/chilled fish hub serving Europe. While it remained a maritime cluster, their focus shifted towards logistics.[29]

Why clusters are successful is dependent on each cluster and its characteristics. There are no quantitative measures when a cluster becomes **mature.** There are however two main guidelines. The first characteristic of a mature cluster is the thickness of the labour market where employees can change jobs without changing residence. The other characteristic is the ability of a cluster to diverse shocks or crisis. As such mature clusters are often self-sustaining and reinforcing.[30]

Some clusters can maintain competitive advantages for centuries before they **decline**, other decrease quite rapidly to the "museum" stage in which a museum is the only remnant of the cluster. An example of the decline of a cluster is the Venice shipbuilding cluster. Being in the 16th and 17th the world's leading cluster for building ships, the last boat was build during World War I.[31]

Why some clusters fail is often not easy to explain as a continuous ability to compete is difficult to maintain. Porter split the causes of decline in two broad categories: endogenous and exogenous. Some clusters fail because of the location itself and others due to developments in the external world. For a while, outsourcing can compensate for local problems, but eventually dynamism and productivity will decrease. External causes could be cartels, barriers to competition, regulatory inflexibility or technological discontinuities. Porter considers the rate of innovation as the ultimate test of the health or decline of a cluster.[32]

What can also happen to a cluster is that it moves to a **renaissance.** The cluster could innovate by shifting from one sector to another. Often this is preceded by new technologies which lead the cluster into a new direction. An example is the packaging paper cluster in Värmland, Sweden. The paper and pulp industry experienced increased challenges in the mid 1990's. Based on a scholarly research, packaging was identified as a potential cluster focus and the mature paper cluster specialised into a new direction. In 2007 the Paper province was even the first cluster in the world to establish an initiative focusing on improving energy savings in the pulp and paper industry. [33]

3.4. The role of government

The question which is most discussed is however if governments should be directly involved in cluster emergence and development. Experts agree on the fact that governments should create policies which help all clusters rather than focussing on a specific cluster and creating market distortions. If policies help whole sectors this presumes natural competition where some companies are better than others. Moreover 'governments should reinforce and build on established and emerging clusters, rather than attempt to create entirely new ones.'[34](Porter, 2008)

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[29] EUROPE INNOVA & PRO INNO (2008), *The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned Union*, paper n.9, Office for Official Publications of the European Communities, ISBN: 978-9279098383

[30] FELDMAN M. & FRANCIS J. (2001), *Entrepreneurs and the formation of industrial clusters* , Harvard

[31] SÖLVELL Ö. (2008), *Clusters- Balancing Evolutionary and Constructive Forces*, Ivory Tower Publishing, Sweden, ISBN: 978-9197478335 - p.39

[32] PORTER M. (2008), *On Competition*, Harvard Business Review Book, USA, p.261

[33] SÖLVELL Ö. (2008), *Clusters- Balancing Evolutionary and Constructive Forces*, Ivory Tower Publishing, Sweden, ISBN: 978-9197478335 - p.82

[34] PORTER M. (2008), *On Competition*, Harvard Business Review Book, USA, p.263

Cluster policies are 'strategic intentions and political objectives in a specific document set up by the government'. (Sölvell, 2008) [35] Europe INNOVA and Pro INNO consider that strictly speaking only development policies strengthening a particular cluster category resulting into specific sectoral cluster initiatives should be labelled cluster policies.[36]

There is a difference between cluster policy and policies for clusters. Policies for clusters are more specific and often target particular clusters which create high distortions on the markets. As such cluster policies are more efficient. In reality, policies are mainly a mix of cluster policies and polices for clusters.

Clusters emerge normally where a competitive advantage is and governments should not try to imitate what is present in other locations. Following this reasoning, government policy should therefore on enhancing competition rather than distorting it. Most clusters form anyway most of the time independently of government action.

Numerous case studies concluded that most clusters require a decade or more to develop in depth or to gain a real competitive advantage.[37] By consequence, most governments fail in creating factors for the emergence of successful clusters. Many policy makers prefer therefore building on existing emerging fields rather than creating new ones. Moreover it is difficult for companies to build trust and governments could enhance this among clusters.

In Austria the government was quite involved in setting up this trust by public investments and stepped than back to let private funding grow. It is therefore crucial that governments are able to identify when to step back and allow clusters to grow without distorting competition. In Scotland all clusters are reviewed periodically to make this decision of when to step back from a cluster as a public organisation.

The Innobarometer 2006[38] pointed out that over 68% of company managers working in a cluster like environment agree that public authorities are fundamental to support the cluster whereas 13% saw a limited role and 15% no important role. So the role of the government in clusters is not clear. It is most strongly welcomed in South European countries and less welcomed in many new Member States. [39]

'Clusters provide a vehicle for bringing companies, government, and local institutions together in a constructive dialogue about upgrading and offer a new mechanism for business-government collaboration.'[40] (Porter, 2008)

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[35] SÖLVELL Ö. (2008), *Clusters- Balancing Evolutionary and Constructive Forces*, Ivory Tower Publishing, Sweden, ISBN: 978-9197478335 - The cluster life cycle, p.50

[36] EUROPE INNOVA & PRO INNO (2008), *The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned Union*, paper n.9, Office for Official Publications of the European Communities, p.32 ISBN: 978-9279098383

[37] PORTER M. (2008), *On Competition*, Harvard Business Review Book, USA, p.257

[38] EUROPEAN COMMISSION (2006), *2006 Innobarometer on cluster's role in facilitating innovation in Europe- Analytical Report*, Flash EB Series #187

[39] EUROPE INNOVA & PRO INNO (2008), *The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned Union*, paper n.9, Office for Official Publications of the European Communities, p.32 ISBN: 978-9279098383

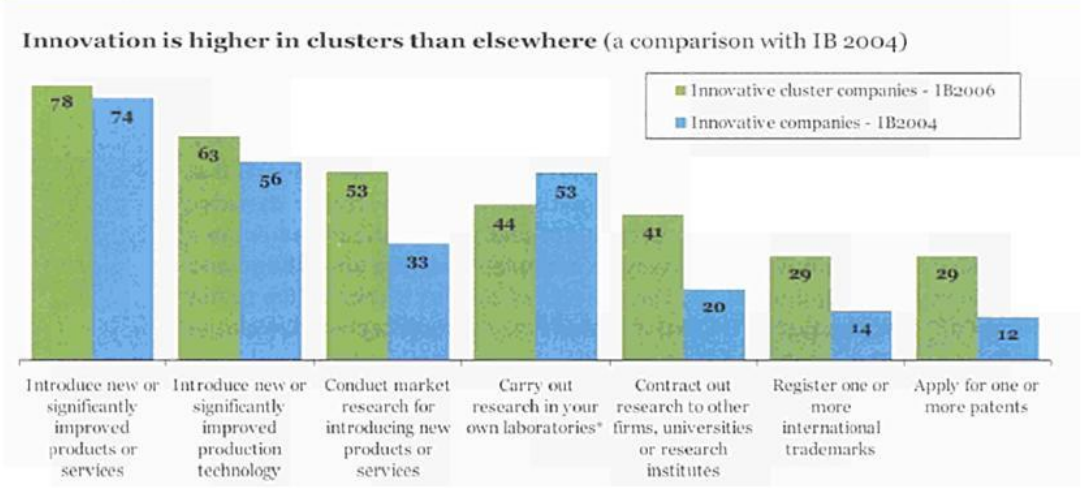
[40] PORTER M. (2008), *On Competition*, Harvard Business Review Book, USA, p.266

3.5. Clusters as drivers of innovation and competitiveness?

So are clusters associated with higher levels of innovation and prosperity? Successful clusters 'affect competition by increasing productivity of constituent firms or industries, by increasing their capacity for innovation and thus for productivity growth, and third, by stimulating new business formation that supports innovation and expands the cluster.' [41] (Porter, 2008)

The Innobarometer 2006[42] shows that cluster firms are way more innovative than non-cluster firms. They register more trademarks, they apply for more patents, they contract out more research and they carry out less research in-house. (*Figure 9*)

Figure 9 – Comparison betwen clustered and non-clustered firms



Source: EUROPE INNOVA & PRO INNO (2008), *The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned Union*, paper n.9, Office for Official Publications of the European Communities, ISBN: 978-9279098383

Regional specialisation is also highly linked to innovative performance and can be measured by the level of patenting. (*Figure 10)* Regions with only few clusters are sometimes doing well and sometimes not, which underlines that there are important factors next to cluster strength having an impact on the performance of a region. [43] In Europe there are no regions with a dispersed employment across a large range of sectors which produce a high level of innovation and vice versa. [44] So specialisation or clustering in a region is essential to create innovation.

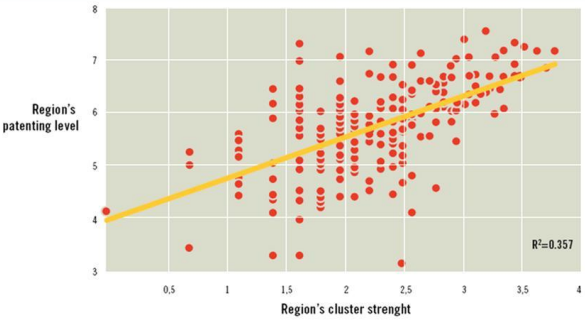
[41] PORTER M. (2008), *On Competition*, Harvard Business Review Book, USA, p.129

[42] EUROPEAN COMMISSION (2006), *2006 Innobarometer on cluster's role in facilitating innovation in Europe- Analytical Report*, Flash EB Series #187

[43] Cf. 3.3.Emergence, evolution and decline of clusters

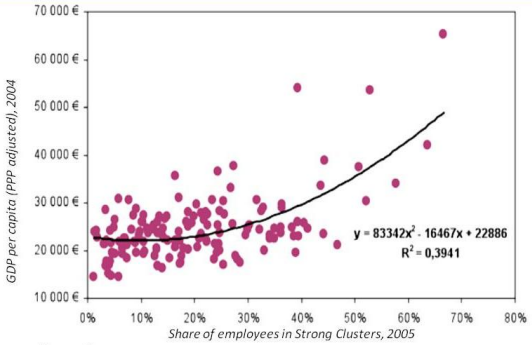
[44] LINDQVIST G. & SÖLVELL Ö. (2011), *Clusnet final report- Organizing clusters for innovation: Lessons from city regions in Europe*, CLUSNET

Figure 10- Relationship between level of patenting and regional specialisation



Source: EUROPE INNOVA- SÖLVELL Ö. & KETELS C. & LINDQVIST G. (2009), *EU Cluster Mapping and Strengthening Clusters in Europe*, paper n.12, Office for Official Publications of the European Communities, ISBN: 978-9279120343

Figure 11 – Cluster strength and prosperity (EU15)



Source: SÖLVELL Ö. (2008), *Clusters- Balancing Evolutionary and Constructive Forces*, Ivory Tower Publishing, Sweden, ISBN: 978-9197478335 - p.25

Figure 11 shows economic prosperity linked to the degree of cluster strength with a location quotient larger than 2. Innovation and economic growth is heavily geographically concentrated. Isolated regions fall behind in innovation and the higher costs make it difficult for them to survive. On the other hand, regions with a high degree of urbanisation as for example metropolises have a direct impact on regional performance.

So clusters attract people, technology, investments and are able to develop global value chains. Cluster regions can transfer easily existing skills into new market and deal well with external shocks. Lowered costs, reduced entry and exit barriers for labour and knowledge spillovers reduce the risks for new companies. Clusters are also able to discern buyer trends much faster than isolated competitors and perceive faster new technology. 31% of companies say that they could increase sales by being part of a cluster. 90% of companies get increased industry research and 40% of this leads to new products and services. [45] So efficiency, flexibility and innovation advantages make companies in clusters more competitive and innovative than other firms.

Wennberg and Lindqvist (2008) covered 4000 new entrepreneurial firms in knowledge intensive sectors in Sweden to show that clustered firms created more jobs, higher tax payments and higher wages to employees. Being part of a cluster has a positive effect on the survival of new firms.[46] So it is normal that Porter's research (2008) uncovered that clustering, industrial concentration and regional specialisation were striking phenomena in all the globally leading firms' regions and that 'a nation's competitiveness depends on the capacity of its industry to innovate and upgrade.' [47]

But the cluster concept also attracts a lot of **criticism.** Porter's definition consists on the boundaries of a cluster but at what level of aggregation shall a cluster be defined?[48] It is difficult for clusters to define concrete boundaries as some are much bigger than others. It must also be recognised that clusters not only grow and prosper but also decline or die. Clusters can also have negative effects such as power asymmetries in supply chains in which larger firms can dictate terms of collaboration. Moreover cluster identification is often based on industry concentration which is however not always resulting in clustering. So it can be the case that more clusters have been identified than actually exist.

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[45] SÖLVELL Ö. (2011), *On Clusters*, EUROPEAN CLUSTER OBSERVATORY, http://www.clusterobservatory.eu/index.html#!view=classroom;url=/classroom/OnClusters/

[46] EUROPE INNOVA & PRO INNO (2008), *The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned Union*, paper n.9, Office for Official Publications of the European Communities, ISBN: 978-9279098383

[47] PORTER M. (2008), *On Competition*, Harvard Business Review Book, USA, p.171

[48] FREIE UNIVERSITÄT BERLIN (2007), *Potential to Network Innovative Clusters in the Baltic Metropoles Regions- Present State and perspectives*

Moreover the rational of cluster policy is criticised as clusters should emerge spontaneously and cannot be created. Cluster policy can draw away resources from firms which are not in clusters and such regions.[49] Clusters can retard innovation if there is too much group thinking. In order to be successful cluster need to stay dynamic for which the right balance between competition and collaboration is crucial. Nonetheless there is much value in the cluster concept if it is applied with proper consideration of the negative aspects.

With the growing globalisation a common belief was that location becomes less important. Many companies are sourcing resources, capital and other inputs all over the world and by consequence diversifying their risk. Naturally many companies responded by moving their activities to low-cost locations. This view changes however radically as location and proximity become more important again. Paradoxically globalisation has strengthened the role of clusters and their development. As companies seek for the best places around the world for their activities, clusters can provide them with a better business environment for their specific needs. Clusters tend therefore to become increasingly specialised and providing complementary goods and services to gain competitive advantages over other clusters. 'Globalisation is one important driver for the growing role of clusters in the modern economy. (...) Companies increasingly rely on the dynamic interaction in clusters, with other companies as well as academic institutions to generate new ideas and translate them into new products, services, and ways to provide value.' (ECPG, 2010) [50]

To conclude all the signatories of the European Cluster Memorandum agreed that 'dynamic clusters are a key driver of innovation and prosperity, helping regions to build unique profiles of specialised capabilities.' [51]

[49] OECD PUBLISHING (2005), *Business Clusters: Promoting enterprise in Central and Eastern Europe*, OECD, ISBN: 92-84007105

[50] EUROPEAN CLUSTER POLICY GROUP (2010), *Final recommendations- A call for Policy Action*, http://www.proinno-europe.eu/ecpg/newsroom/ecpg-final-recommendations p.2

[51] EUROPE INNOVA- SÖLVELL Ö. & KETELS C. & LINDQVIST G. (2009), *EU Cluster Mapping and Strengthening Clusters in Europe*, paper n.12, Office for Official Publications of the European Communities, ISBN: 978-9279120343

4. THE SITUATION OF THE EUROPEAN UNION

In order to give advice on the potential of cluster collaboration in the EU, it is crucial to know the current situation of the EU. Once European countries have been the most powerful economies on earth, but World War II left them destroyed and poor. European integration was seen as an escape to avoid extreme forms of nationalism and wars and attain a more unified Europe. The EU was officially created in 1993 by the Treaty of Maastricht.[52]

In September 2009 the global economic crisis hit Europe stronger and deeper than any crisis before. Borderless markets have not only generated growth and job creation but exposed Europe to new threats such as contagion from problems in other markets. The EU uncovered major weaknesses and needed restructuring.

4.1. The situation of the EU Member States

The European Union is composed by 27 Member States (*figure 12*) and an internal market of 500 million ageing citizens (*Appendix 11.1.- Figure C*) The situation of the different States proves however to be very different even though the EU membership requires rigorous criteria.

Figure 12 – Map of EU 27 Member States

Source: http://www.geo.uni-frankfurt.de/ipg/fgg/vortraege/vortraege0809/index.html (5.07.2012)

The economic crisis had a huge impact on the performance of EU27 countries defined by GDP, employment and productivity growth rates (*figure 13)*.

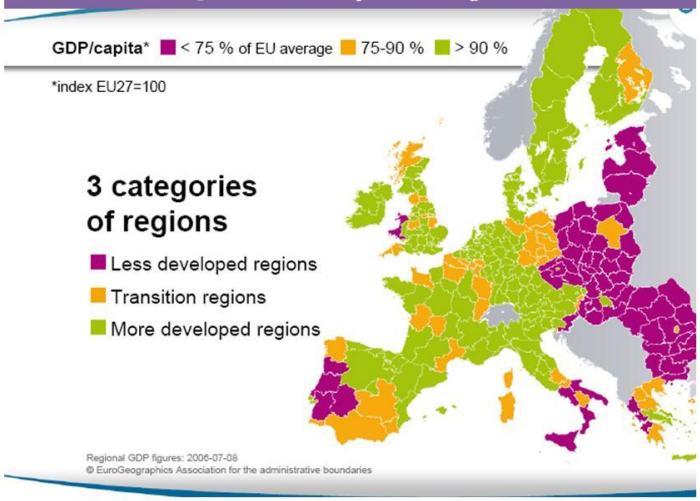
[52] EUROPEAN PARLIAMENT (2009), *Fact Sheets on the European Union*, Office for Official Publications of the European Communities, ISBN: 978-9282324691

Figure 13 – GDP, employment and productivity growth rates in the EU27

Source: EUROPEAN COMMISSION (2010), *European Competitiveness Report 2010,* Office for Official Publications of the European Communities, ISBN: 978-9279176203 p.23

In terms of real **GDP** most countries started to recover by 2009 except Greece and Romania. (*Appendix 11.1.- Figure D*) Even though the recession was severe the regression of the GDP came not close to wiping out the previous growth. *Figure 14* shows European regions in terms of GDP/capita.

Figure 14 – GDP/capita in EU regions



EUROPEAN COMMISSION (2012) *EU Cohesion Policy 2014-2020,* http://ec.europa.eu/regional_policy/what/future/proposals_2014_2020_en.cfm (25.07.2012)

Many regions saw a huge increase in **employment** from 2000 to 2007.[53] (*Appendix 11.1- Figure E)* Countries most affected by the housing bubble were Estonia, Ireland and Spain, having the largest rises in unemployment during the recession. Spain has currently with over 20% the highest unemployment rate. In terms of **productivity**, Germany, Netherlands, France and Belgium are close to the rate of the US, but other countries are substantially behind.[54] The crisis hit mostly countries which accumulated imbalances during the previous boom period such as Hungary, Estonia and Latvia.[55]

The **national debt ration** compared to GDP (*Figure 15*) shows that Greece has the biggest debt closely followed by Italy, Ireland, Portugal and Belgium.

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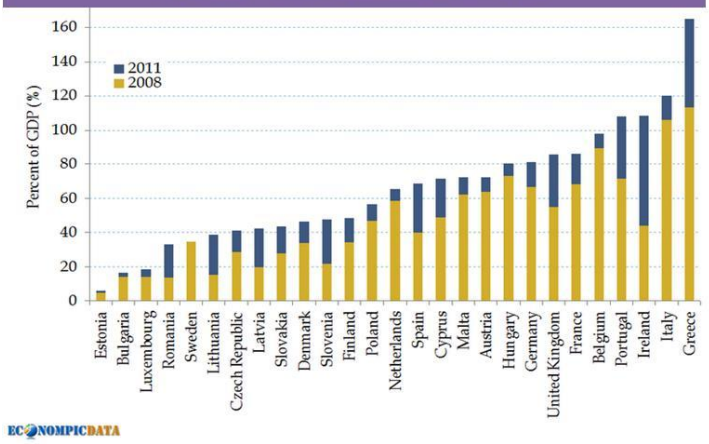
[53] EUROPEAN COMMISSION (2011), *European Competitiveness Report 2011,* Office for Official Publications of the European Communities, ISBN: 978-9279216916, p.35

[54] DIRECTORATE-GENERAL FOR ENTREPRISE AND INDUSTRY, *EU Productivity and Competitiveness: An Industry Perspective. Can Europe Resume the Catching-Up Process*?

[55] EUROPEAN COMMISSION (2009), *A Europe of achievements: Visions of leading policymakers and academics*, Office for Official Publications of the European Communities, ISBN: 978-9279111471

Figure 15 – EU27 national debt to GDP



Source: http://economicdata.blogspot.com/2012/04/hows-that-austerity-working.html (17.07.2012)

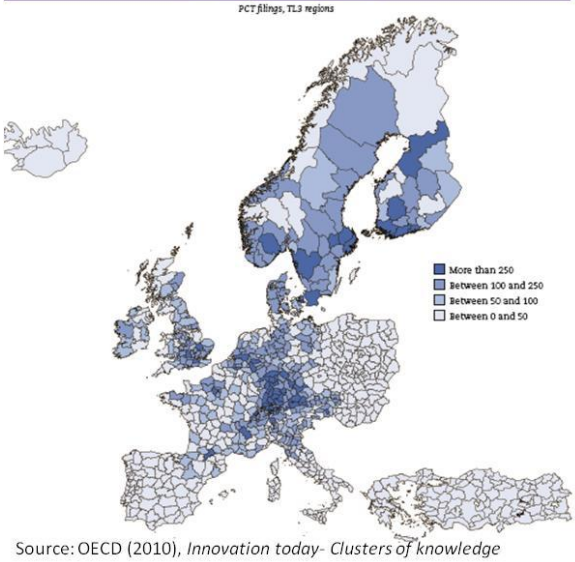
Important factors for **innovation** as for example R&D intensity (*figure 16*) or patent data (*figure 17*). Countries with a high share of foreign owned patents (*Appendix 11.1. – Figure F*) such as the Baltic States have a comparatively low absolute number of patent inventions. An exception is Finland as 90% of the granted patents are the result of Finish R&D. Also the UK has a high share in foreign owned and total patents which can be explained by the large multinationals having their main location in the UK and the large inward FDI stock. [56]

Figure 16 – R&D Intensity –Average annual growth (%)

	2000-2006(f)	2006-2009(p)
Belgium	-0.91	1.74
Bulgaria	-1.73	4.80
Czech Republic	4.20	-0.48
Denmark	1.68	8.84
Germany	0.48	3.76
Estonia	11.05	8.08
Ireland	1.85	12.20
Greece	0.03	-0.17
Spain	4.77	4.85
France	-1.21	1.69
Italy	1.34	3.80
Cyprus	9.75	2.65
Latvia	7.97	-13.19
Lithuania	5.08	1.70
Luxembourg	0.07	0.37
Hungary	7.25	4.62
Malta	6.95	-3.20
Netherlands	-0.60	-0.72
Austria	4.02	3.22
Poland	-2.43	6.69
Portugal	5.22	18.81
Romania	3.68	1.83
Slovenia	1.95	12.25
Slovakia	-4.68	-0.37
Finland	0.64	3.12
Sweden	-4.70	-0.76
United Kingdom	-0.63	2.34
EU	-0.10	2.78

Source: EUROPEAN COMMISSION (2011), *Innovation Union Competitiveness report*, Office for Official Publications of the European Communities, ISBN: 978-9279145414

Figure 17 – Patents per million inhabitants, Europe average 2005-2007

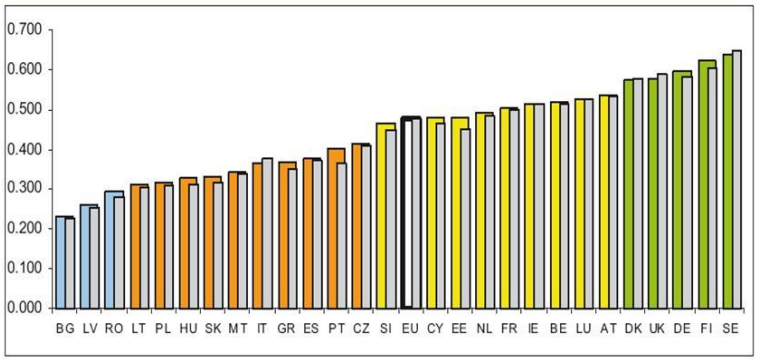


Source: OECD (2010), *Innovation today- Clusters of knowledge*

The European Innovation Scoreboard (*Figure 18)* identified in green innovation leaders, in yellow innovation followers, in orange moderate innovators and in blue catching-up countries.

[56] EUROPEAN COMMISSION (2010), *European Competitiveness Report 2010*, Office for Official Publications of the European Communities, ISBN: 978-9279176203 p. 95

Figure 18 – Innovation performance EU27 Member States (2009)



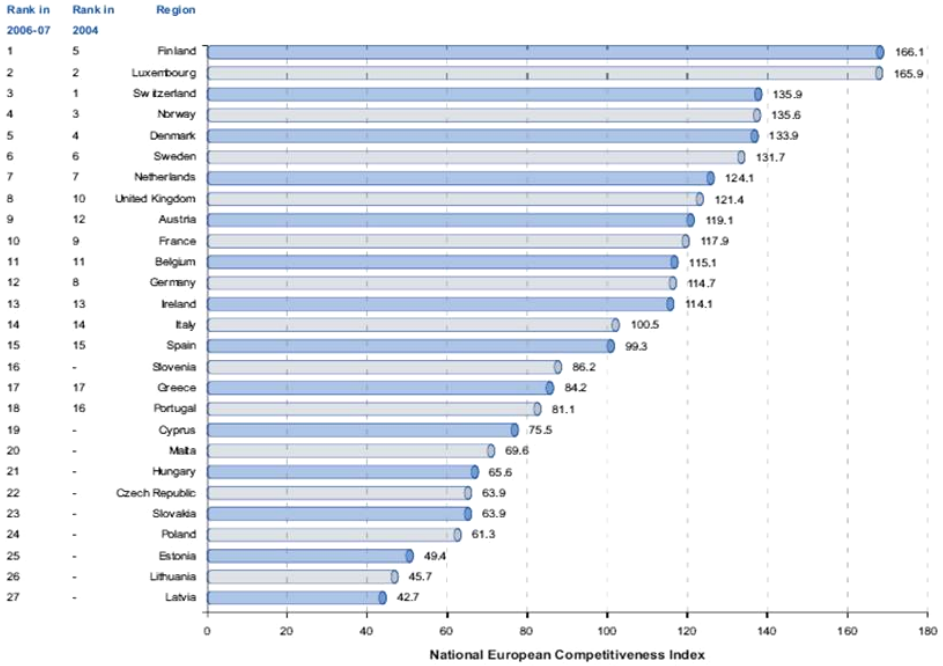
Note: The Summary Innovation Index (SII) is a composite of 29 indicators going from a lowest possible performance of 0 to a maximum possible performance of 1. The 2009 SII reflects performance in 2007/2008 due to a lag in data availability.

The grey coloured columns show 2008 performance as calculated backward from 2009 using the next-to-last data for each of the indicators. This 2008 performance is not identical to that shown in the EIS 2008 as not for all indicators data could be updated with one year. The difference between the columns for 2008 and 2009 show the most recent changes in innovation performance.

Source: PRO INNO EUROPE (2009), *European Innovation Scoreboard 2009*, Paper n.15, Office for Official Publications of the European Communities, ISBN: 978-9279142222

The **competitiveness** of each country is shown by the European Competitiveness Index taking into account creativity, economic performance, infrastructure and accessibility. (*Figure 19*)

Figure 19 – European Competitiveness Index 2006-2007



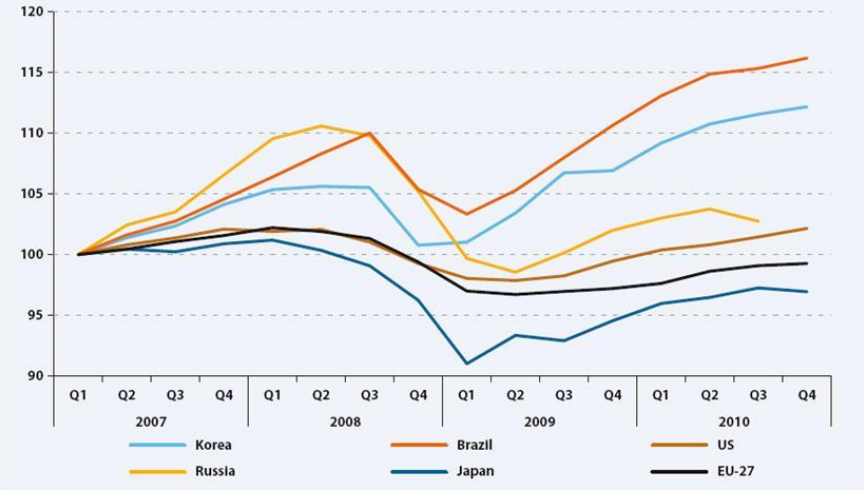
Source: HUGGINGS R. & DAVIES W. (2006), *European Competitiveness Index 2006-2007*, Robert Huggins Associates Ltd, Wales, ISBN: 1902629034

Having analysed all these variables, leaders in the EU are Sweden, Finland, Germany, the UK and Denmark. Countries from the ten new Member States need still time to develop. Next to Ireland, Greece, Italy and Portugal also have a huge debt. Spain's main problem is its unemployment. It has been said already that these huge imbalances could become a great problem for the future EU and its' competitiveness.

4.2. The European Union in the world

The European Union has weakened in recent years against the rest of the world as the economic activity was shifting more towards Asia and other emerging countries.

Figure 20 – Real GDP in EU27 and selected economies (2007=100)



Source: EUROPEAN COMMISSION (2011), *European Competitiveness Report 2011,* Office for Official Publications of the European Communities, ISBN: 978-9279216916, p.40

The EU27's income before the crisis has not yet returned while South Korea experienced a 10%, India a 23% and China even a 32% income rise to the pre-crisis level.[57](*Figure 20*) Asia suffered from a conjunctural downturn and not from internal imbalances such as the US or EU27 so their recovery is faster.

In comparison with the main global players EU-27 is however the biggest importer and exporter in the world (*Figure 21)* and has the highest share in world trade in 2009 (17%). China has overtaken in 2007 the USA as the second biggest exporter and is the only country with a positive trade balance. The EU27 has a negative trade balance, but lower than the one from the US.

Figure 21– Main players in the world market of goods (billion€)

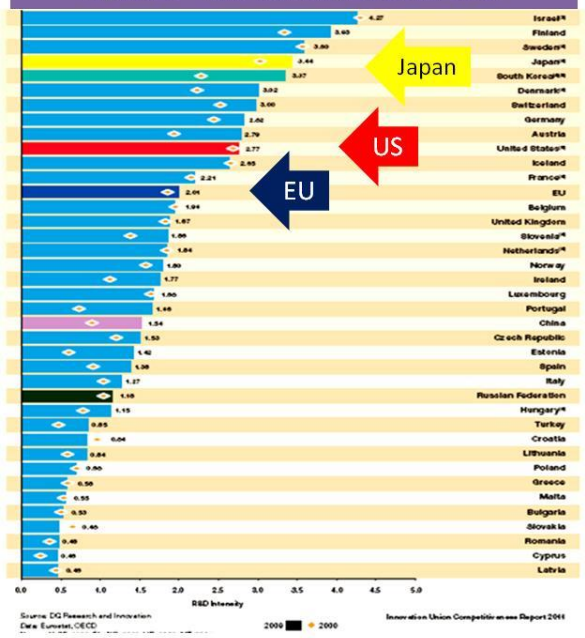
Exports	EU-27	USA	China	Japan	Canada
2004	953.0	657.5	477.0	454.8	255.0
2005	1 052.7	726.9	612.5	478.2	289.8
2006	1 160.1	825.9	771.7	515.1	309.2
2007	1 240.5	848.3	890.2	521.2	306.6
2008	1 309.8	883.8	972.7	531.3	318.2
2009	1 094.4	757.6	861.5	416.3	226.1
Imports					
2004	1 027.5	1,226.2	451.2	366.0	220.1
2005	1 179.6	1,392.4	530.5	414.7	252.7
2006	1 352.8	1,528.4	630.3	461.2	278.8
2007	1 433.4	1,471.8	697.6	454.0	277.5
2008	1 564.9	1,471.9	770.0	518.4	285.4
2009	1,199.2	1,148.5	720.9	395.7	230.2
Balance					
2004	-74.6	-568.7	25.8	88.8	34.9
2005	-126.8	-665.5	82.0	63.6	37.1
2006	-192.7	-702.4	141.3	53.9	30.4
2007	-192.9	-623.6	192.6	67.2	29.1
2008	-255.1	-588.1	202.7	12.8	32.8
2009	-104.8	-390.9	140.6	20.6	-4.0

Source: EUROSTAT (2010), *External and Intra-European Union Trade- Data 2004-2009,* ISBN: 978-9279163524

[57] EUROPEAN COMMISSION (2011), *European Competitiveness Report 2011*, Office for Official Publications of the European Communities, ISBN: 978-9279216916, p.40

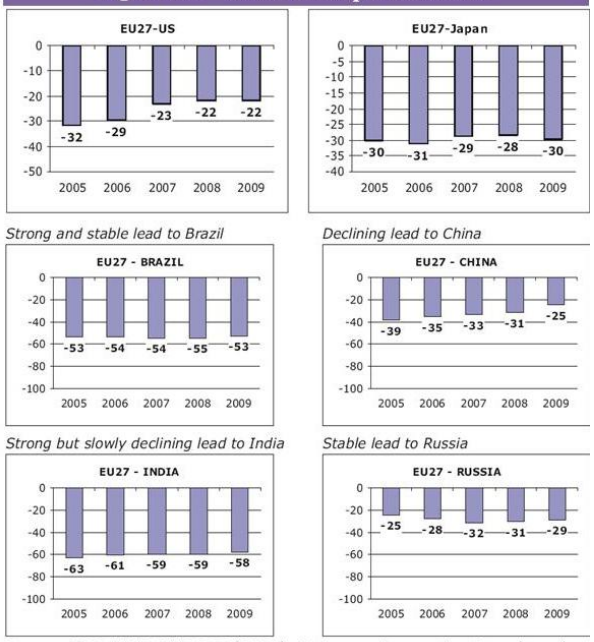
Spending R&D intensity is much higher in Japan and the US than in the EU (*figure 22*). The EU pays more attention to higher education than to the business sector.[58] By consequence the EU has a decreasing innovation performance against many countries (*Figure 23).*

Figure 22 – R&D Intensity 2000 and 2009



Source: EUROPEAN COMMISSION (2011), *Innovation Union Competitiveness report*, Office for Official Publications of the European Communities, ISBN: 978-9279145414

Figure 23 – Innovation performance



Source: PRO INNO EUROPE (2009), *European Innovation Scoreboard 2009*, Paper n.15, Office for Official Publications of the European Communities, ISBN: 978-9279142222

The Innovation Union Scoreboard 2006[59] shows that US is performing better than the EU27 in 10 indicators. The only indicators in which the EU was stronger were public R&D expenditure and knowledge-intensive service exports. The strongest concurrent are however China, India and ASEAN countries as their share of world GDP has risen by more than 60%, their share in world trade by more than 50% and the share in world FDI stocks by more than 15% in the last decade. It is expected that the BRIC countries account by 2030 for 60% of world GDP.[60] So the pressure from BRIC countries and the US on EU companies is huge. The challenges ahead definitely include improving EU businesses' competitiveness.

4.3. EU policy for research, competitiveness and innovation: From the Lisbon strategy to the Europe 2020 strategy

So the EU needed and still needs new strategies in order to enhance competitiveness. As such the Lisbon strategy is leading into the Europe 2020 strategy to answer to the structural challenges of the future Member States.

[58] EUROPEAN COMMISSION (2009), *A Europe of achievements: Visions of leading policymakers and academics*, Office for Official Publications of the European Communities, ISBN: 978-9279111471

[59] PRO INNO EUROPE (2007), *European Innovation Scoreboard 2006- Comparative analysis of innovation performance*, Paper n.2

[60] EUROPEAN COMMISSION (2011), *European Competitiveness Report 2011*, Office for Official Publications of the European Communities, ISBN: 978-9279216916, p.203

A way 'towards a sustainable Europe'[61] has been started with the **Lisbon strategy** set out in 2000 by the European Council. It is an action and development plan to make Europe more dynamic. Based on Schumpeter's[62] idea that innovation is the motor for economic change it should further deal with the stagnation of economic growth and the low productivity in the EU. The Lisbon strategy was set up for the period 2000 to 2010 and should aim to 'make Europe, by 2010, the most competitive and the most dynamic knowledge-based economy in the world'[63] (EC, 2005).

In 2005 the strategy however needed reform after only moderate results could be proven due to a lack of determined political action. The reformed Lisbon strategy was a **strategy for growth and jobs** as resources needed to meet wider economic, social and environmental ambitions.[64]

With the communication '**Putting knowledge into practice: A broad-based innovation strategy for the EU**'[65], a broad based innovation strategy was adopted in 2006 as 'innovation plays a critically important role in Europe's ability to respond effectively to the challenges and opportunities of the global economy.'[66] (Council of the EU, 2006) Clusters are identified as one of the nine strategic pillars to promote innovation successfully.

For the first time an EU perspective on how to accelerate the development of more competitive clusters is outlined in the communication **'Towards world-class clusters in the European Union: Implementing the broad-based innovation strategy'**[67], adopted on the 17.10.2008. It calls for 'more excellence and cooperation at policy and business level so that Europe's strengths can be better leveraged into market success at global level.'[68] The strategy builds on those clusters with the greatest potential to improve the global competitiveness and drive structural change. Being the basis for this strategy, the US was only able to generate about one world-class cluster per 10 million inhabitants in the recent decade. This would signify that the five largest economies of the EU would be able to create around 30 world-class clusters.[69]

Developed as the successor to the Lisbon Strategy, the **Europe 2020 strategy** (2010- 2020) is a 'new strategy for the EU to develop as a smarter, knowledge based, greener economy, delivering high levels of employment, productivity and social cohesion'[70] (EUROSTAT, 2011) for the next ten years to come. This industrial policy should prepare Europe for global competition.

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[61] EUROPEAN COMMISSION (2002), *A European Union Strategy for sustainable development*, Office for Official Publications of the European Communities, ISBN: 92-89416769

[62] SCHUMPETER J. (1934), The theory of economic development, Cambridge, Massachusetts: Harvard University Press

[63] SAMARDZIJA V. & BUTKOVIC H. (2010), From the Lisbon strategy to Europe 2020, Institute for International Relations, Zagreb, ISBN: 978-9536096534

[64] EUROPEAN COMMISSION (2005), *Growth and Jobs- working together for Europe's future- A new start for the Lisbon strategy* , Office for Official Publications of the European Communities, ISBN: 92-89486929

[65] EUROPEAN COMMISSION (2006), *Putting knowledge into practice: A broad-based innovation strategy for the EU*, COM(2006) 502 final

[66] COUNCIL OF THE EUROPEAN UNION (4.12.2006), *Council conclusions on a broad based innovation strategy: Strategic priorities for innovation action at EU level*, 2769th competitiveness council meeting, Brussels

[67] COMMISSION OF THE EUROPEAN COMMUNITIES (5.11.2008), *Towards world-class clusters in the EU: Implementing the broad-based innovation strategy*, SEC 2637, Brussels

[68] COMMISSION OF THE EUROPEAN COMMUNITIES (5.11.2008), *Towards world-class clusters in the EU: Implementing the broad-based innovation strategy*, SEC 2637, Brussels

[69] EUROPA INTERCLUSTER (2010), *White Paper- The Emerging of European world-class clusters*, http://www.intercluster.eu/index.php?option=com_flexicontent&view=items&cid=1:frontpage&id=159:release-of-the-white-paper-on-the-emerging-of-world-class-clusters&Itemid=1

[70] EUROSTAT: Europe 2020 (06.08.2011) http://epp.eurostat.ec.europa.eu/portal/page/portal/europe_2020_indicators/headline_indicators

The Europe 2020 strategy concentrates on smart, sustainable and inclusive growth which is addressed by seven flagship initiatives. (*Appendix 11.1 - Figure G*) Two flagship initiatives are mainly important for clusters:

- 'Innovation Union' promotes knowledge partnerships and strengthens links between education, business, research and innovation
- 'Industrial policy for the globalisation era' improves the business environment, especially for SMEs

Five ambitious targets define were the EU should be in 2020. (*Figure 24)*

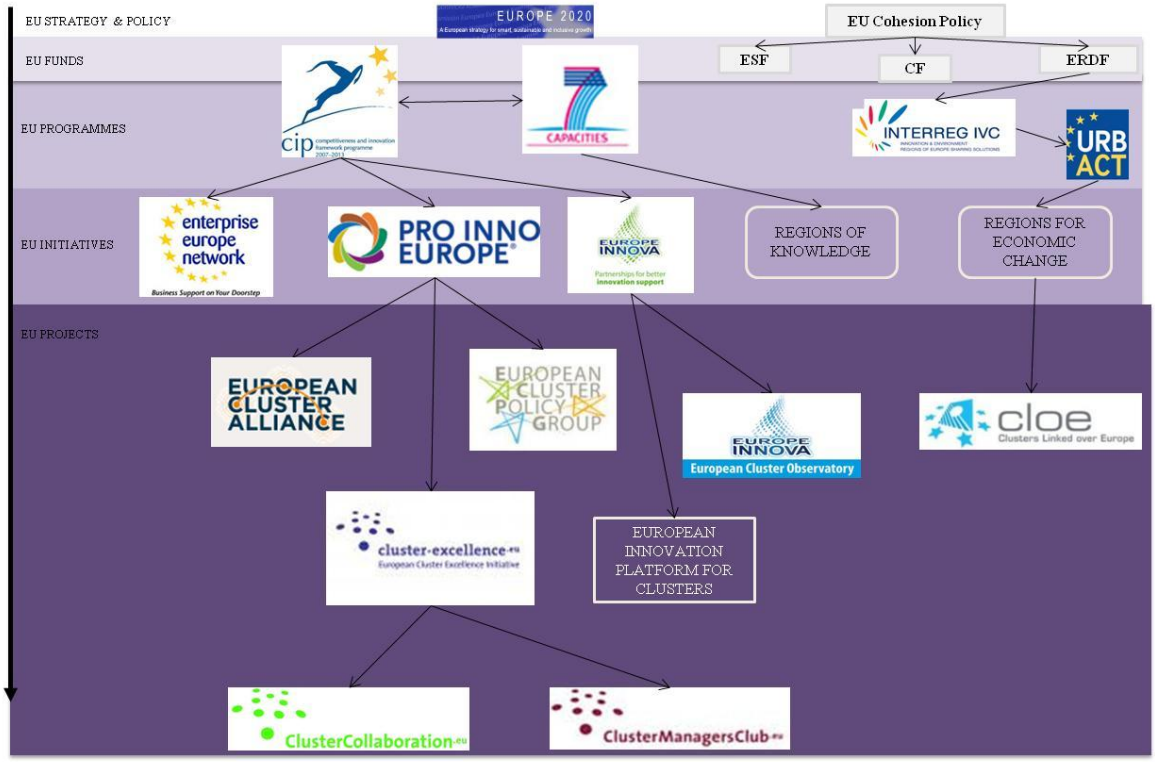
Figure 24 – Europe 2020 strategy: Headline targets

1.	75% of the population aged 20-64 should be employed
2.	3% of the EU's GDP should be invested in R&D
3.	the "20/20/20" climate/energy targets should be met (including an increase to 30% of emission reductions if the conditions are right)
4.	the share of early school leavers should be under 10% while at least 40% of the younger generation should have a tertiary degree
5.	20 million fewer people should be at risk of poverty.

Source: SAMARDZIJA V. & BUTKOVIC H. (2010), From the Lisbon strategy to Europe 2020, Institute for International Relations, Zagreb, ISBN: 978-9536096534

To reach all those targets and implement recommendations, DG Enterprise and Industry has established several programmes and initiatives. *Figure 25* shows some of the most important in the EU to keep an overview for the following parts.

Figure 25 – Major programmes and initiatives



Source: composed by author

4.4. EU Policy and Programs

There are many different policies and programs in the EU having an impact on clusters. The main programmes and initiatives of *Figure 26* and their respective budget will be analysed in detail.

Figure 26 – Instrument/programme

DG	Instrument / Programme	EUR bn
ENTR	Competitiveness and Innovation Framework (CIP)	3.6
	Europe INNOVA and PRO INNO (European Cluster Observatory;	0.21
	European Cluster Alliance; European Innovation Platform for Clusters;	
	European Initiative for Excellence of Cluster Organisations; ...)	
	Intelligent Energy Europe	0.73
	LIFE + (DG ENV)	2.14
RTD	7th Framework Programme for Research and Technological Development	53.0
	Regions of Knowledge	0.13
	Marie Curie	4.7
INFSO	parts of FP7 and CIP	unknown
REGIO	Cohesion Policy	347.4
	...of which earmarked for innovation (Structural Funds)	86.0
	European Territorial Cooperation (INTERREG)	7.75
EAC	European Institute of Innovation and Technology (EIT)	0.31
	Knowledge and Innovation Communities (KICs)	0.27
	Leonardo da Vinci (life-long learning)	1.7

Source INSTITUTE FOR INOVATION AND TECHNOLOGY, *European Clusters go international- Networks and clusters as instruments for the initiation of international business cooperation*

4.4.1. Cohesion policy

The necessary investment framework to deliver the Europe 2020 objectives is provided by the Cohesion Policy which includes the European Regional Development Fund (ERDF), the European Social Fund (ESF) and the Cohesion Fund (CF).

Since the 1980's public authorities used cohesion policy instruments to develop innovation strategies. As part of the 'towards world-class clusters' approximately €86 billion of the Cohesion Policy Fund of the current period (2007-2013) have been allocated to research and innovation.

The ERDF has a major objective in European Territorial cooperation which covers three types of programmes: the cross-border cooperation, the transnational cooperation and the interregional cooperation (INTERREG) programmes. The European grouping of territorial cooperation (EGTC) was formed to overcome the obstacles hindering cross-border cooperation and constitutes a legal entity.

The next programme period (2014-2020) of the EU cohesion policy mainly will be based on linking allocation of fund to the Europe 2020 objectives.

4.4.2. 7th Framework Programme

The 7th Framework Programme (FP7) for Research and Technical Development bundles all research-relate EU initiatives together under a common roof and will last for seven years (2007-2013)

FP7 has a substantial budget increase compared to FP6, reflecting the high priority of research in the EU. It aims to strengthen the scientific and technological base of European industry and encourages international competitiveness while promoting research that support EU policies.

4.4.3. Competitiveness and Innovation Programme

The Competitiveness and Innovation Programme (CIP) 'is intended as a single coherent legal basis for all Community action relating to competitiveness and innovation in the framework of the Lisbon strategy'.[71]

It is planned to run from 2007 to 2013 with an overall budget of € 3.6 billion and focuses mainly on the joint development of new and better tools for use by cluster organisations and innovative SMEs. It is composed into three programmes focussing on entrepreneurship and innovation; information communication technologies policy support and on intelligent energy Europe.

4.5. EU Initiatives

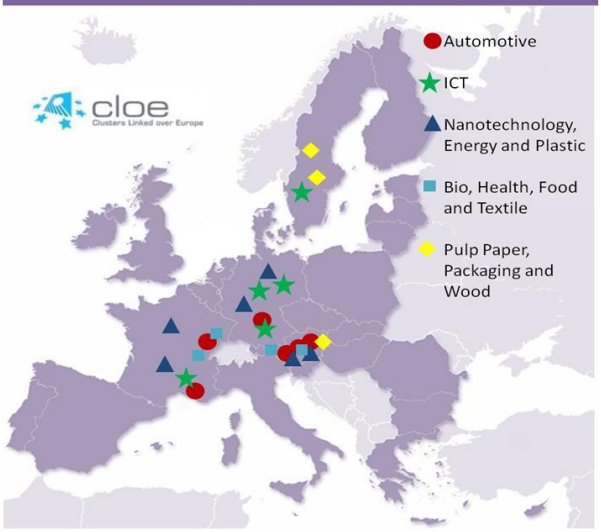
Only the most important EU top-down initiatives to attain the objectives of Europe 2020 strategy are analysed in this part.

'**Regions of knowledge'** financed under FP7 in close cooperation with CIP is part of the European Research Area (ERA) policy and aims at strengthening the research potential of European regions through encouraging the development and networking of research-driven clusters. Already during FP6, the initiative launched 32 pilot projects strengthening regional research potential. One of those projects was FINE, the Food Innovations Network Europe which united eight different regions with agro-food clusters and developed strategies to bring in more investment in research and technological development. [72]

The '**Regions for economic change'** initiative financed under INTERREG IVC (cohesion policy) and URBACT for the period 2007-2013 improves dynamism in regional and urban networks. A project under this initiative was **CLOE-** Clusters linked over Europe. It is an informal alliance of clusters all around Europe (*figure 27*) that are united by a shared commitment to work closely together.

[71] CIP: http://cordis.europa.eu/fp7/cip_en.html (27.06.2012)
[72] http://zakonczone.ppnt.poznan.pl/networkfine/ (22.07.2012)

Figure 27 –Clusters linked over Europe



Source: composed by author

Co-financed under CIP was the **Enterprise Europe Network** which builds on the former Euro Info Centre and Innovation Relay Centre and offers the combined services to boost growth and jobs. It brings together close to 600 business support organisations from more than 50 countries and helps small companies to make the most of the business opportunities in the EU.

Other major initiatives are Europe INNOVA and PRO INNO both initiated under the CIP but many of their projects are sponsored by FP7. As their projects led to many cluster collaborations in the EU they will be analysed in more detail.

4.5.1. Europe INNOVA

Europe INNOVA was founded in 2006 under CIP to support all forms of innovation. It is the main pan-European platform with a focus on the joint development of better tools for use by cluster organisations in support of innovative SME's. It has a sector based approach which has reinforced cooperation among clusters. [73]

The first phase (2006-2009) was designed to identify and analyse leverages and barriers to innovation within specific sectors. (*figure 28)* The second phase was more oriented towards the development and testing of new practical innovation support services for SMEs. (*figure 29*)

[73] Europe Innova Powerpoint presentation, http://www.europe-innova.eu/web/guest/about (14.05.2012)

Figure 28 – Europe INNOVA 2006-2009	
Cluster networks	
Automotive:	The **BelCAR** project (bench learning in cluster management in the automotive sector) initiated under Europe INNOVA organised 6 matchmaking events with 220 participants. Together with another project named **TCAS** which promoted transnational clustering in the automotive sector, they led to the **European Automotive Strategy Network** regrouping companies and clusters from the European automotive sector.
Biotechnology:	**NetBioCluE** networks biotechnology clusters in Europe
Energy:	The **CENCE** project imitated by Europe INNOVA connected Energy clusters across Europe. It led to the plan to build a European Energy Cluster Platform which is however not yet in construction.
ICT/ Optics:	**ENOC** (European Network of Optical Clusters) was able to develop a SWOT analysis for European optics and photonics cluster, **mClusters** should integrate Europe's Mobile ICT Community, **NICE** networks ICT clusters in Europe, **OMI-NET** exploits network transversality in opto-micro-nano innovative clusters
Food/Drink:	**ABC Network** enhanced networking of European Agro-Biotech clusters
Space:	The **CASTLE** project represented clusters in Aerospace and Satellite Navigation Technology Applications linked to entrepreneurial innovation. At the end of the project it led to **ENCADRE**, the European Network of Clusters for Satellite Applications Development.
Textile:	**INNOTEX** was a best practice platform for entrepreneurial innovation for the technical textiles sector.
Financing networks	
Biotechnology:	**AFBIO**
Construction:	**BUILD-NOVA**
Energy:	**EIFN**
Food/drink:	**ENFFI**
ICT:	**ACHIEVE, Gate2Start**
Medical devices:	**InJection**
Space	**INVESat, FinanceSpace**
Textile:	**NetFinTex**
Standards networks	
Biotechnology:	**Biohealth**- standards repository and portal for e-health
Environment:	**Depuis**- Design of environmentally-friendly products using information standards
Shipbuilding:	**Euromind**
Furniture:	**Innovafun**- Applying open standards to INNOVA furniture business processes
Construction:	**Stand-inn**
Public procurement	**Steppin**- Standards in European public procurement lead to innovation
Source: Composed by author	

Figure 29 – Europe INNOVA 2009-2012

Source: Europe INNOVA

The European Innovation Platform for Knowledge Intensive Services (KIS-IP) has seven sectoral partnerships. (*Figure 30*)

Figure 30 – Europe INNOVA: Innovation in services partnerships	
ACHIEVE MORE	addresses barriers to the development of KIS ventures in the ICT sector.
KIS PIMS	supports innovation in services that cover life of new technologies for renewable energy
KIS4SAT	established an innovation support platform in the field of satellite downstream services
GreenConServe	develops a number of tools in support of innovative companies in the field of sustainable construction
MOBIP	established an innovation platform for innovative companies in the field of mobile technologies
ImMediaTe	supports SMEs in the digital media and creative industries sector
BCreative	will streamline different innovation support mechanisms for SMEs in the creative sector
Source: Composed by author	

IMP³ROVE stands for improving innovation management performance with sustainable impact.

Novel Tools & Services is the area in which new tools and instruments are developed, tested and promoted in support of innovation. The major initiative in this field is TAKE IT UP.

Sectoral Innovation Watch gives detailed insights into sectoral innovation performance.

The Eco-innovation Observatory analyses information on trends in eco-innovation to provide a strategic knowledge resource.

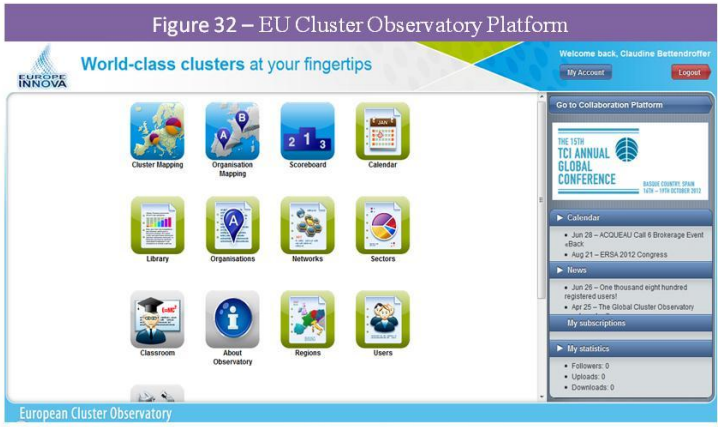
Eco- innovation established an eco-innovation platform (Eco-IP) to accelerate solutions by several sectoral partnerships. (*Figure 31*)

Figure 31 – Europe INNOVA: Eco-innovation	
BIOCHEM	tests tools to support companies with bio-based products in the chemical sector
INNOWATER	provides better innovation support tools in sustainable water and wastewater
REMake	develops tools to support innovative companies in recycling and resource efficiency
EcoTroFood	addresses environmental challenges by the food industry
ECOLINK+	strengthens Europe's Eco-innovation community by exploiting synergies between actions
Source: Composed by author	

The **European Cluster Observatory** (ECO) launched in 2007, provides neutral and comparable statistical information on cluster policies and relative cluster strengths in the EU. The platform is targeting three main groups: policy makers, cluster management staff and academics.

The main services offered at the ECO are cluster and organisation mapping, data on clusters, a cluster library and a classroom for cluster education. It also produces reports and studies on clusters. The next step of the ECO is to map also clusters in emerging industries.

Figure 32 – EU Cluster Observatory Platform



Source: European Cluster Observatory: http://www.clusterobservatory.eu/ (26.06.2012)

In January 2008 the launch of the **European cluster memorandum** at the European Presidency Conference on Innovation and Clusters in Stockholm marked an important step towards encouraging cluster development as it was signed by more than 70 national and regional authorities and agencies.

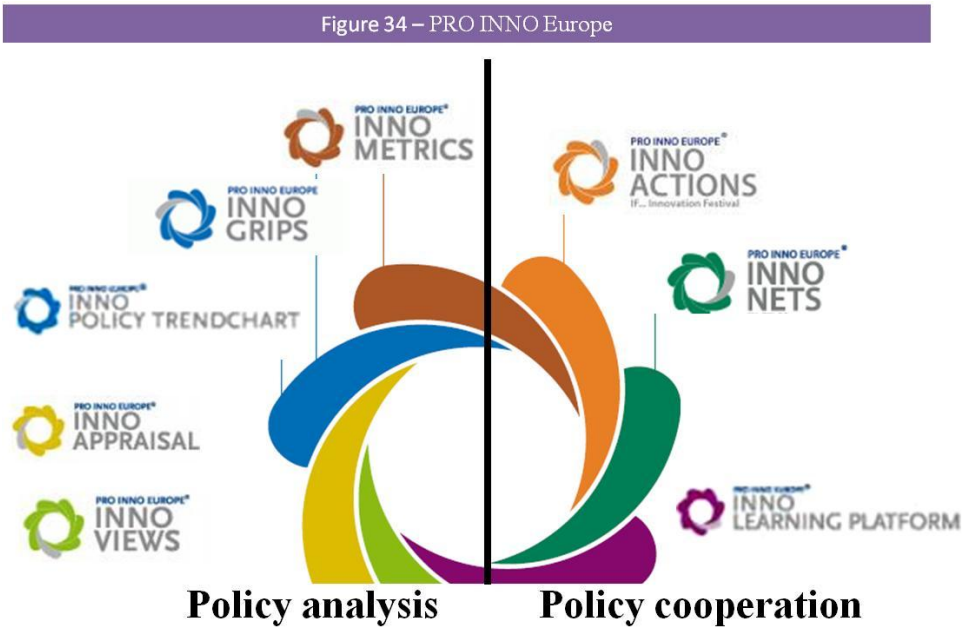
The European Innovation Platform for Clusters (**Cluster-IP**) will foster cooperation between sectoral cluster initiatives. It has two main partnerships (*figure 33)*.

Figure 33 – Europe INNOVA: Cluster cooperation	
ABC EUROPE	contributed to the establishment of more world-class clusters in the biotechnology sector through tailor-made support services to minimum 750 SMEs
EcoClup	supports over 1200 companies in eco-innovative industries in their pursuit of growth and internationalisation
Source: Composed by author	

4.5.2. PRO INNO Europe

PRO INNO Europe is based on 2 major pillars: Policy analysis and Policy cooperation, each subdivided into different blocks (*figure 34*)

Figure 34 – PRO INNO Europe



Source: Composed by author

The pillar '**Policy analysis'** is composed by:

- INNO-Metrics' aiming to understand sources and patterns of innovative activity in order to develop better policies. It's acting by the **European Innovation Scoreboard** and the **Innobarometer** to benchmark innovation performance of Member States.
- INNO Policy Trend Chart describes major innovation policy trends.
- INNO Appraisal finalised innovation programme evaluations and impact assessments.
- INNO Grips 2006-2010 aimed to raise awareness on the new aspects of innovation and related policy issues. INNO Grips 2010-2013 aims to support policy makers in adopting appropriate policy responses to emerging innovation needs, trends and phenomena.
- INNO Views explores better innovation policy instruments

The pillar '**Policy cooperation'** brings actors responsible for innovation together with a view to foster transnational cooperation.

Figure 35 – PRO INNO Europe: INNO Nets 2006- 2009

BSR-INNOnet	to create links in the Baltic Sea region
CEE-Cluster Network	to link eleven partner regions in central and eastern Europe
CLUNET	to share experiences among 15 regions
DEFINE	to encourage policy formulation more adapted to trans-national innovation processes in value-chains
Ennovation	to better coordinate national e-business initiatives
IMQ NET	to develop a different method of learning from management expertise based on thematic workshops
INNET	to promote interaction and cooperation between funding schemes and SME's
INNO-Deal	helps regions to share experiences and visions to improve economic performance and develop trans-regional cooperation
IPPS	aims at advancing service-related innovation policy and programme development
VALOR	coordinates and networks key players in innovation policy to develop a common agenda and joint action plan
Source: Composed by author	

Out of INNO-Nets 2006-2009 (*figure 35)*, four partners formed the **European Cluster Alliance** (ECA). This open platform managed by TACTICS brings together authorities and innovation agencies active in the fields of clusters to develop better cluster policies in the EU. It is supported by the European Cluster Memorandum and since January 2008 it is also open to external cluster-relevant organisations in Europe.

Based on the decision of the EC the **European Cluster Policy Group** (ECPG) created in 2008 helps member states develop a more strategic vision to reach critical mass and world-class excellence. It has been composed of 20 independent high-level experts established for the term of 18 months. As their mandate ended in September 2010, the ECPG looked into future challenges for cluster policies and created final recommendations.[74] They argue for a stronger alignment of EU budgets priorities and framework conditions for cluster development. Recipients of cluster funding should be reviewed and structural changes are needed in cluster knowledge infrastructure and collaboration platforms. New ways for spreading best practice should be created, they should be run with aligned operating procedures and they should be reduced in their overall number. Based on these final recommendations an open policy learning space called 'European Cluster Cooperation Forum' operates from January 2012 to August 2013 under the ECO and works in close cooperation with the ECA.

[74] EUROPEAN CLUSTER POLICY GROUP (2010), *Final recommendations- A call for Policy Action*, http://www.proinno-europe.eu/ecpg/newsroom/ecpg-final-recommendations

INNO-Nets 2009-2012 covers a new set of initiatives that focus more on clusters specifically in eco-innovation and services. (*Figure 36)*

Figure 36 – PRO INNO Europe: INNO Nets 2009 - 2012	
EPISIS	facilitates transnational cooperation between policy-makers and innovation agencies in the field of services innovation
TACTICS	which is coordinated by OSEO, aims at supporting and further expanding the European Cluster Alliance and contributing to the development of better cluster policies and practical tools in Europe. An example of such a tool is the internationalisation handbook for cluster. It is assisted by the TACTICS Reflection Group composed of 14 external policymakers
INNO-Partnering Forum (IPF)	identifies and exploits synergies between public innovation agencies in Europe and proposes new approaches to innovation
ECOPOL	is a public innovation partnership for better policies and instruments in support of eco-innovation
Source: Composed by author	

INNO Actions 2006-2009 implemented joint actions between innovation agencies. (*Figure 37)*

Figure 37– PRO INNO Europe: INNO Actions 2006-2009	
ADMIRE	aims to encourage SMEs to introduce Design Management procedures in order to improve competitiveness
EASY	addresses the supply and demand side of investment in knowledge-based businesses and develop new models of best practice
EOS- EurOffice Services	helps entrepreneurs set up a business outside their home country by providing office space and local services
Innovation Circus	identifies the driving forces behind innovation and locates all potential stakeholders
Ip4inno	increase the understanding of intellectual property by SME's
Tech SME Partnering	promotes the investments in technology transfer and collaborative platforms
Source: Composed by author	

INNO Actions 2009- 2011 bring together further public actors responsible for innovation and implemented IF - Innovation Festival which is the celebration of innovation and creativity across 6 European cities and cluster excellence initiative.

Cluster-Excellence.eu initiative (ECEI) brings together the most experienced persons and organisations in Europe in order to promote the excellence of cluster management by developing quality indicators and assessment procedures. Professional trainings raise the quality of cluster management in the EU and the Cluster Management Quality Label is an independent prove of cluster management excellence accepted all over Europe.

ECEI established a **European Club of Cluster managers**. It is an association of individuals who can share problems, information and experiences on a platform to tackle new challenges. In this framework a European Cluster Manager is awarded each year for his performances.

At its core ECEI provides access to the **European Cluster Collaboration Platform** (ECCP). This platform free of charge enables more targeted interaction between cluster organisations and their members. ECCP provides the mapping and profiling of cluster organisations and members as well as it establishes sectoral and thematic communities. So it is especially useful for setting up future collaboration with new partners.

The INNO Learning Platform intends to promote transnational innovation policy cooperation across Europe. The initiative consists mainly of the Learning Platform Consortium and the INNO Learning Steering Group.

5. CLUSTERS IN THE EU

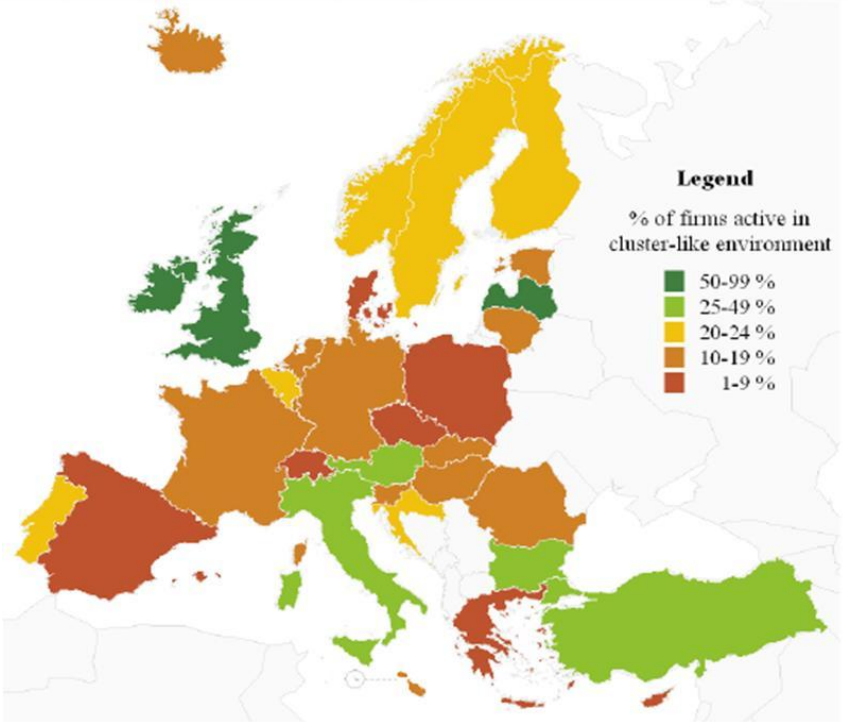
A closer look can be taken now at the situation of clusters in the EU to evaluate its potential for cluster collaboration. The term 'cluster' became only popular in Europe when the EU decided to integrate innovation and cluster development into their strategy. From an academic perspective this is fascinating as the theory of clusters is pushed for the first time in history by not only one country but a whole Union of countries.

'While clusters are part of regional economies in countries across the globe and at all stages of economic development, there are indications that they might be particular important for understanding and addressing the economic challenges that Europe is facing.' (Ketels & Sölvell, 2006) [75]

5.1. Cluster competitiveness in the EU Member States

Nowadays there are around 2000 clusters in the EU and the ECO stats that 'between 30% and 40% of all employment is in industries that concentrate, or cluster, regionally' [76] (EC, 2007) In some regions this share is over 50% while in others it drops to 25%.[77] Every fourth firm employing at least 20 people in the EU works in a cluster-like environment.[78] (*Figure 38*)

Figure 38 – Percentage of firmes active in cluster-like environment



Source: EUROPEAN COMMISSION (2006), *2006 Innobarometer on cluster's role in facilitating innovation in Europe- Analytical Report*, Flash EB Series #187

[75] EUROPE INNOVA – KETELS C. & SÖLVELL Ö. (2006), *Innovation clusters in the 10 new member states of the European Union*, paper n.1, Office for Official Publications of the European Communities, ISBN: 92-79031961

[76] DIRECTORATE-GENERAL FOR ENTREPRISE AND INDUSTRY (2007), *Innovation clusters in Europe: A statistical analysis and overview of current policy support*, Luxembourg, ISBN: 978-9279072895

[77] EUROPE INNOVA & PRO INNO (2007), *Innovation clusters in Europe: A statistical analysis and overview of current policy support*, paper n.5, Office for Official Publications of the European Communities, ISBN: 978-9279072895

[78] EUROPEAN COMMISSION (2006), *2006 Innobarometer on cluster's role in facilitating innovation in Europe- Analytical Report*, Flash EB Series #187

Competitiveness of clusters in terms of productivity, by which a country uses its resources, can be analysed at 3 different levels: inherited endowments, macroeconomic competitiveness and microeconomic competitiveness.[79]

5.1.1. Endowments of clusters

Natural endowments such as natural resources or physical location enable the cluster to get a certain degree of prosperity but it's not enough in an advanced economy where the emergence of clusters[80] is more often based on factor conditions.

The Hamburg Logistics Cluster has been created in 2006 and is today Europe's most important logistic location in international trade and serves as a 'gateway to the world'. A major endowment for this cluster was its location at Europe's second largest sea harbour and public funds allocated by the Hamburg senate. [81]

The OMNIPACK cluster in the Czech Republic was initiated by the key industrial holding PolyPlast. More than 300 firms have been asked and 21 organisations agreed to participate in this ERDF co-funded project for packaging companies.

Europe tends to rank high on the quality of institutions but is very low in its ability to mobilize these inputs through entrepreneurship, new firm formation and corporate renewal. Moreover it ranks high in R&D spending but doesn't know how to turn this research into economically valuable innovations.[82]

5.1.2. Macroeconomic competitiveness

Macro conditions are the framework conditions by which clusters are influenced such as human development, health, education, politics as also physical and monetary laws.

In the 90's some pioneer regions developed in Europe **cluster policies**, but it has only been from the mid-2000's onwards that they are moving into the mainstream. One of the earliest countries to implement an official cluster policy was Austria. This policy area is still at an early stage and it is still too early to expect a serious assessment of their economic impact. It may take up to 15 years before the full impact of cluster policies may be seen.[83] Nowadays there is hardly any EU member left without cluster policies which is partly related to the Lisbon strategy. INNO-Policy Trend Chart and ERAWATCH identified in 2008 more than 130 specific national measures in 31 European countries to support clusters.[84]

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[79] PORTER M. (2011), *Innovation and Competitiveness: Implications for Policy and for Saudi Arabia,* GCF 2011, http://www.youtube.com/watch?v=NZt6kUKE-88

[80] Cf. 3.3 Emergence, evolution and decline of clusters

[81] KOMPETENZNETZE DEUTSCHLAND (February 2010), *Cluster Management Excellence- Volume 2: Sustainability and Effectiveness of Clusters and Networks,* Federal Ministry of Economics

[82] EUROPE INNOVA – KETELS C. & SÖLVELL Ö. (2006), *Innovation clusters in the 10 new member states of the European Union*, paper n.1, Office for Official Publications of the European Communities, ISBN: 92-79031961

[83] EUROPE INNOVA & PRO INNO (2008), *The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned Union*, paper n.9, Office for Official Publications of the European Communities, ISBN: 978-9279098383

[84] EUROPE INNOVA & PRO INNO (2008), *The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned Union*, paper n.9, Office for Official Publications of the European Communities, ISBN: 978-9279098383

In Europe there is a wide variation when it comes to how many and what kinds of ministries are responsible for the implementation of cluster policies. In thirteen countries mostly located in Western Europe at least two ministries are responsible for cluster policies. These are perceived as important in 9 countries, as medium important in 12 countries and as low important in 9 countries. Apparently a factor which defines the importance of cluster policy is the autonomy of regions and overall organisation of the country.[85] When it comes to national agencies responsible for cluster policies, Ireland and Finland have the most, with seven and eight agencies respectively. However only three out of the 75 reported agencies, have as their only task cluster policy. One example is the National Office of European Technology Platforms in Lithuania.[86] Actually the White paper[87] suggests that competitiveness policy should be done on a European level as it is part of EU law and innovation policy should be practised by each country.

To move from a cluster policy to real action, governments create **cluster programmes**, which allocate funding, create organisational responsibilities and define specific conditions. A total of 69 national cluster programs have been identified with only seven having a regional or local focus. Half of all cluster programs have a specific focus on a particular cluster lifecycle and tend to concentrate on emerging clusters. Targets are mainly private businesses especially SME's and R&D institutions while only a minority focuses on training/ education. 50% of cluster programs include also cross-border activity even if these are mainly export projects.[88] Following the decline in the Basque region, a government sponsored dialogue among different stakeholders and the results of a cluster mapping in the region initiated the Basque Country Competitiveness Programme in Spain in order to promote active cooperation among firms in the region. The government selected 12 cluster initiatives with an overall annual spending of 2 to 2.4 million Euros per year.

The funding of national cluster programmes is for 63% based on national budgets and 19% supported by EU cohesion policy. A total of 88 regional cluster programmes have been identified next to the national cluster programmes: 52 have a regional development, 40 have an industry and enterprise and 30 a science and biotechnology focus, but it is common that the regional cluster programmes have several target groups per programme.[89]

A cluster supported by the European cohesion policy is the Digital Signal Processing (DSP) Valley (*figure 39*) in Belgium. After the foundation in 1996 by the University of Leuven and Philips an extension to the Eindhoven region in Netherland was enabled in 2005 by the INTERREG 3A funding.

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[85] SÖLVELL Ö. (2008), *Clusters- Balancing Evolutionary and Constructive Forces*, Ivory Tower Publishing, Sweden, ISBN: 978-9197478335 - The cluster life cycle, p.51

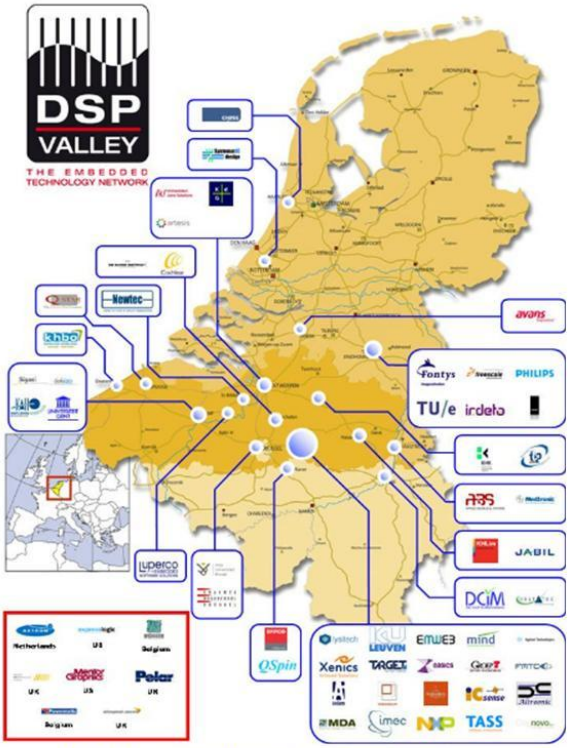
[86] SÖLVELL Ö. (2008), *Clusters- Balancing Evolutionary and Constructive Forces*, Ivory Tower Publishing, Sweden, ISBN: 978-9197478335 - The cluster life cycle, p.52

[87] EUROPA INTERCLUSTER (2010), *White Paper- The Emerging of European world-class clusters*, http://www.intercluster.eu/index.php?option=com_flexicontent&view=items&cid=1:frontpage&id=159:release-of-the-white-paper-on-the-emerging-of-world-class-clusters&Itemid=1

[88] SÖLVELL Ö. (2008), *Clusters- Balancing Evolutionary and Constructive Forces*, Ivory Tower Publishing, Sweden, ISBN: 978-9197478335 - The cluster life cycle, p.52

[89] EUROPE INNOVA & PRO INNO (2008), *The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned Union*, paper n.9, Office for Official Publications of the European Communities, p.32 ISBN: 978-9279098383

Figure 39 – DSP Valley



Source: http://www.dspvalley.com/en/about/region/ (03.08.2012)

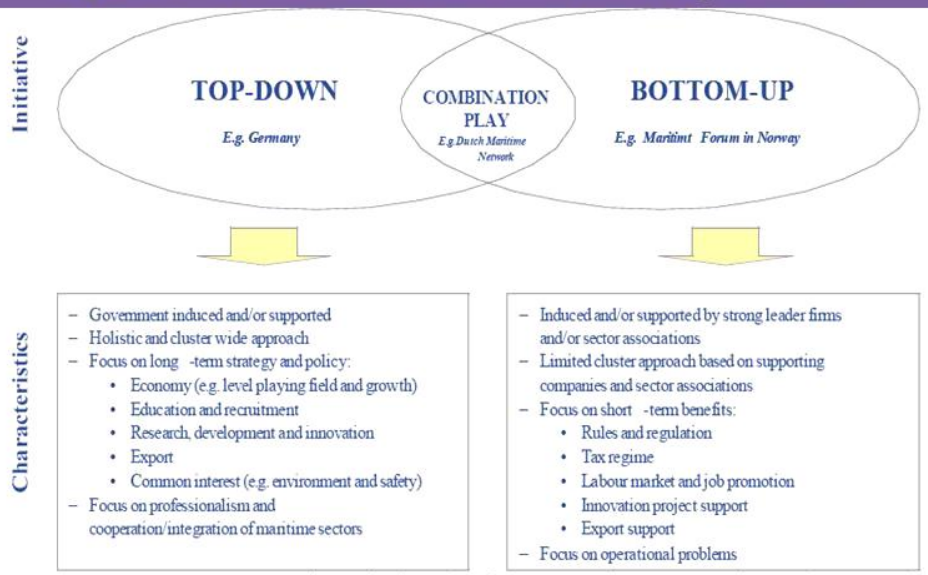
Cluster initiatives are 'organized efforts to enhance the competitiveness of a cluster, involving private industry, public authority and/or academic institutions.'[90] (Sölvell &Lindqvist &Ketels, 2003) Those cluster initiatives having promotion of innovation and new technologies as an important objective are clearly more successful in improving competitiveness.[91]

According to the Cluster Greenbook, most cluster initiatives in the EU active in 2003 were initiated 1999 or later (72%) which proves that it is still a very recent subject. Mainly initiated by government (32%), by industry (27%) or equally by both (35%), companies tend to be the most influential parties in the governance of cluster initiatives. Financing comes primarily from government (54%), from industry (18%) and from both (25%). Almost all cluster initiatives (89%) have a dedicated facilitator and 68% have some sort of office. Overall 81% of cluster initiatives have met their goals while only 4% were disappointing and have not led to much change. [92]

Most cluster initiatives are based on a top-down approach from national governments. Bottom-up cases only sometimes happen where firms and universities come together without direct governmental support. The difference between top-down and bottom-up is shown in *figure 40* with the maritime sector as example.

[90] SÖLVELL Ö. (2008), *Clusters- Balancing Evolutionary and Constructive Forces*, Ivory Tower Publishing, Sweden, ISBN: 978-9197478335 - The cluster life cycle, p.18
[91] SÖLVELL Ö. (2008), *Clusters- Balancing Evolutionary and Constructive Forces*, Ivory Tower Publishing, Sweden, ISBN: 978-9197478335 - The cluster life cycle, p.54-56
[92] KETELS C. & LINDQVIST G. & SÖLVELL Ö. (June 2008), *Clusters and Cluster Initiatives*, Center for Strategy and Competitiveness-Stockholm School of Economics

Figure 40 – Classification of maritime cluster organisations



Source: EUROPEAN COMMISSION (2008), *the role of Maritime Clusters to enhance the strength and development in European maritime sectors- Executive Summary,* Office for Official Publications of the European Communities, ISBN: 978-9279115592

Failure in cluster initiatives is often related to lack of consensus or funding, absence of an explicitly formulated vision, low participation of larger companies or lack of governmental integration. Many of the cluster initiatives launched in the last years 'lack strategic orientation or critical mass of specialised expertise, services, resources, suppliers and skills of its innovation actors' (Europe INNOVA, 2011)[93].

Contrary to the US which demands strategic planning, short term measurable goals and evaluation to follow-up on performance, the EU has little evidence of serious **cluster evaluation**.[94] In cluster initiatives it is often only possible to see strategic action after 10 years, evaluations are carried out between three and five years and it is difficult to distinguish between the different effects of a cluster instrument. In the Nottingham City Bioscience a study was carried out in order to ascertain if there are a sufficient number of bio-science firms and activities in the region to form a cluster initiative, which not only led to an increased awareness of the cluster but also led to a discovery of specialised service suppliers.[95] Cluster evaluation needs further development in the EU to recognise failure.

Sustainable cluster initiatives are mostly under **triple helix governance** (government, academia, business) with a strong private sector leadership. The triple helix of the GöteborgBio cluster in Sweden is formed by a pharma, a medical equipment and a biotech company, the local and the regional business development agency, the national foreign-aid agency, a national innovation support fund and two local universities.[96] Sustainable cluster initiatives have also often leaders with passion who see the broad picture. So cluster initiatives are not only driven on a macro level but also on a micro level.

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[93] Europe INNOVA: http://www.europe-innova.eu/web/guest/cluster-cooperation/overview;jsessionid=BA8F5E966D8DEB3F9EC5B6CF0CA8D02F (03.05.2011)
[94] SÖLVELL Ö. (2008), *Clusters- Balancing Evolutionary and Constructive Forces*, Ivory Tower Publishing, Sweden, ISBN: 978-9197478335 - The cluster life cycle, p.59
[95] SÖLVELL Ö. (2008), *Clusters- Balancing Evolutionary and Constructive Forces*, Ivory Tower Publishing, Sweden, ISBN: 978-9197478335 - The cluster life cycle, p.66
[96] LINDQVIST G. & SÖLVELL Ö. (2011), *Clusnet final report- Organising clusters for innovation: Lessons from city regions in Europe*, CLUSNET

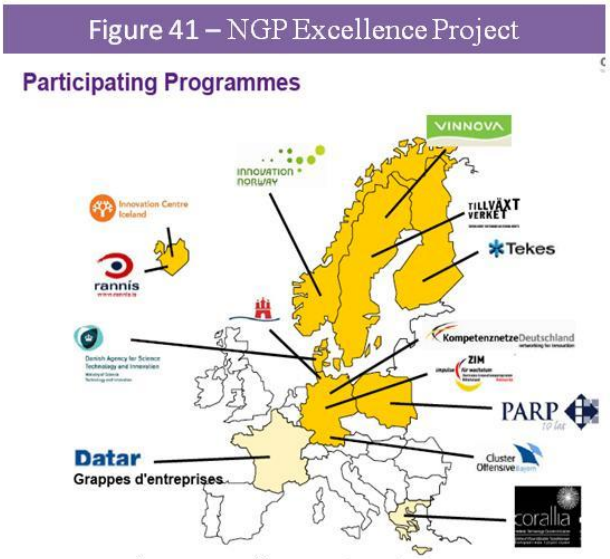
5.1.3. Microeconomic competitiveness

A stable macroeconomic environment creates opportunities but does not create value itself. This is why microeconomic capacity is considered to be so important. Microeconomic policy arrangements are at the roots of competitiveness as they create conditions under which businesses can thrive. Enterprises in clusters create the microeconomic business and innovation environment.

Companies try to maximise their own gains and their intent is normally not to improve the overall region or market. Adam Smith's 'Invisible Hand' is coming into play as individual ambition benefits society. A strong cluster brand helps to attract talent companies and resources to the region.

Cluster organisations act as legal entity engineering and managing the clusters and around 1000 have been identified in the EU. They often establish a **cluster management** which is sometimes seen as a new professional qualification and quite important for cluster collaboration. The ECEI increases opportunities for firms in the cluster as they often organise training programmes, facilitate commercial cooperation and gather market and technical intelligence. An example where 'cluster management excellence makes the difference', is the NGP Excellence Project in the Nordic countries, Germany and Poland. *(Figure 41*)

Figure 41 – NGP Excellence Project

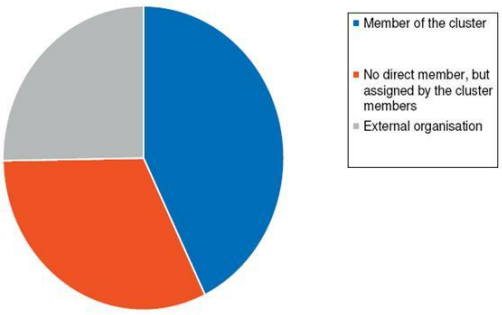


Source: VDI/VDE-IT- ZU KÖCKER G. (2011), *Cluster Management Excellence makes the difference- Findings and conclusions from the first Pan-European cluster management and cluster programme benchmarking exercises*

A **clear strategy** on the micro level creates sustainable and competitive clusters. Targets must be comprehensible and achievable, not in conflict with goals of the respective institution and representing a clear benefit for all partners. (*Appendix 11.1 - Figure H)*

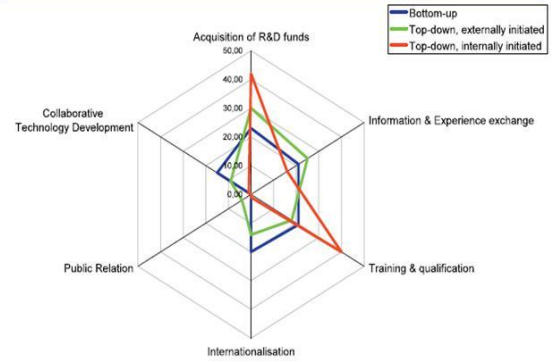
A German study from the Institute for innovation and technology (2009) demonstrates that the management of a cluster is mostly governed by a member of the cluster *(Figure 42).* Mostly clusters are managed by one or two persons and not often by more than 5. The most relevant tasks for cluster managers are shown in *Figure 43* and in what they see future challenges for their competitiveness in *Figure 44.*

Figure 42 – Cluster governance



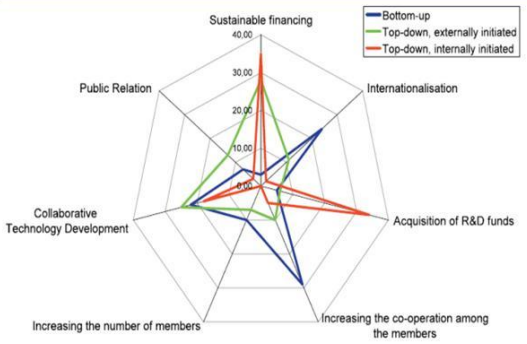
INSTITUTE FOR INNOVATION AND TECHNOLOGY (November 2009), *Clusters in Germany- An empirical based insight view on emergence, financing, management and competitiveness of the most innovative clusters in Germany*, 2nd edition, Kompetenznetze Deutschland

Figure 43 – Most relevant tasks for clusters



INSTITUTE FOR INNOVATION AND TECHNOLOGY (November 2009), *Clusters in Germany- An empirical based insight view on emergence, financing, management and competitiveness of the most innovative clusters in Germany*, 2nd edition, Kompetenznetze Deutschland

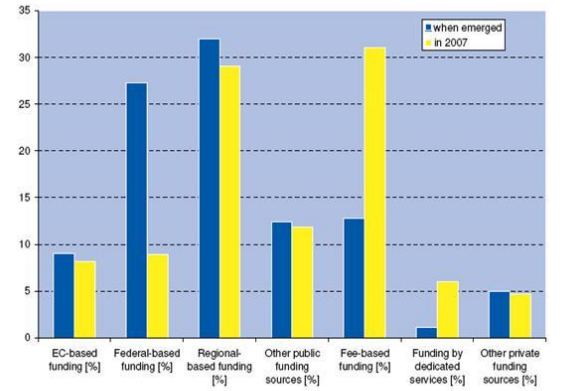
Figure 44 – Future challenges for clusters



INSTITUTE FOR INNOVATION AND TECHNOLOGY (November 2009), *Clusters in Germany- An empirical based insight view on emergence, financing, management and competitiveness of the most innovative clusters in Germany*, 2nd edition, Kompetenznetze Deutschland

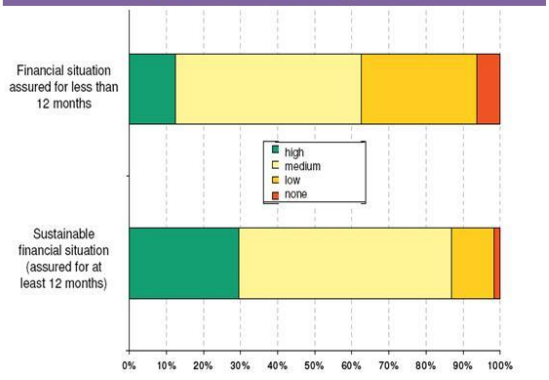
As cluster managers consider the acquisition of R&D funds as a quite important task and sustainable financing a big future challenge, the **cluster's financing** is very important for cluster microeconomic competitiveness. *Figure 45* shows the different types of financing obtained by clusters and *figure 46* shows the growth of German clusters with different financing terms. Results show that public funding is the preferred funding method and to be successful, it should be assured for at least 12 months.

Figure 45 – Types of financing



INSTITUTE FOR INNOVATION AND TECHNOLOGY (November 2009), *Clusters in Germany- An empirical based insight view on emergence, financing, management and competitiveness of the most innovative clusters in Germany*, 2nd edition, Kompetenznetze Deutschland

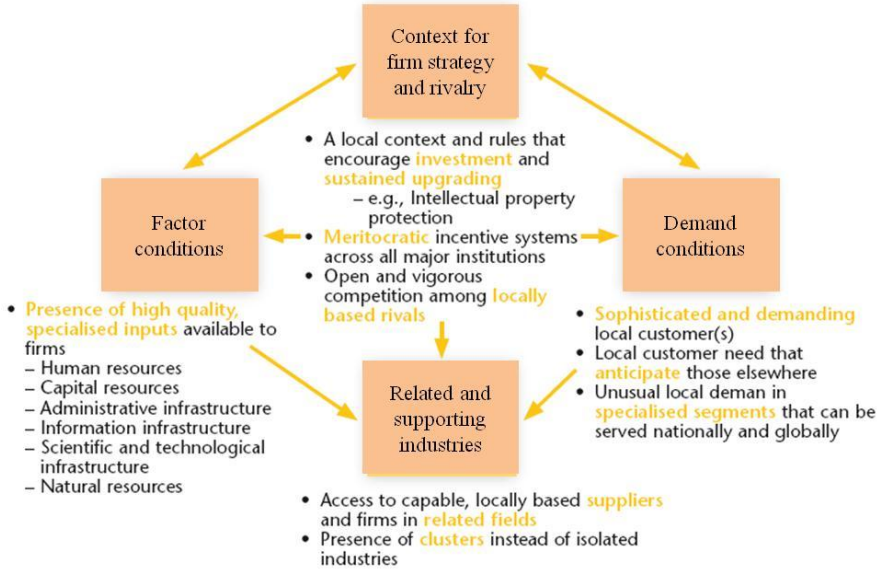
Figure 46 – Financing terms



INSTITUTE FOR INNOVATION AND TECHNOLOGY (November 2009), *Clusters in Germany- An empirical based insight view on emergence, financing, management and competitiveness of the most innovative clusters in Germany*, 2nd edition, Kompetenznetze Deutschland

In general to sum up all those factors important for cluster competitiveness, **Porter's diamond** is often used. *Figure 47* shows a strong diamond driving a growing and innovative cluster.

Figure 47 – Porter's diamond of a strong cluster

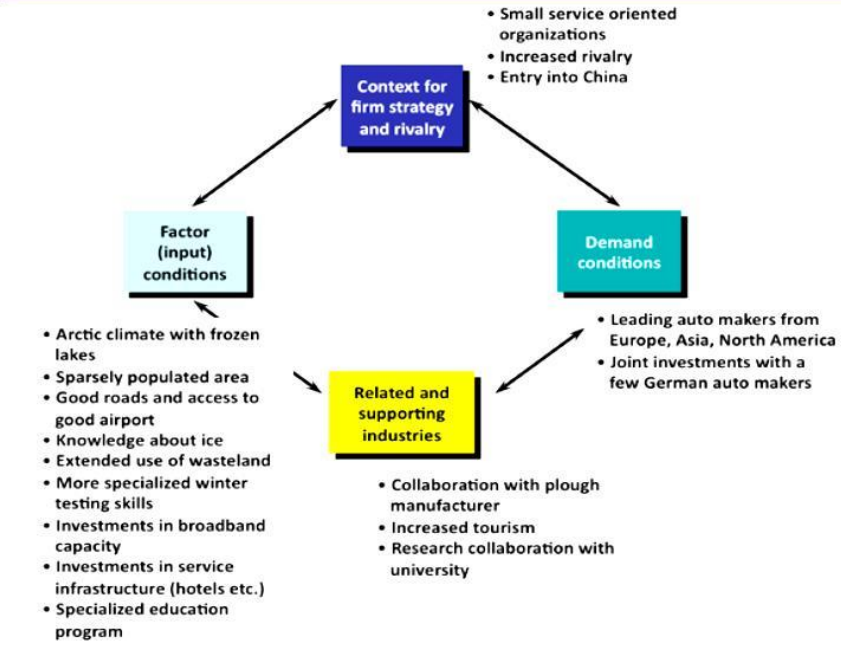


Source: Michael E. Porter (2004).

Source: EUROPE INNOVA – KETELS C. & SÖLVELL Ö. (2006), *Innovation clusters in the 10 new member states of the European Union*, paper n.1, Office for Official Publications of the European Communities, ISBN: 92-79031961

To conclude this part, a small town in Sweden called Arjeplog started in the mid 70's with testing brakes on their frozen lake and is nowadays a global hotspot for winter car testing. Porter's diamond for the Arjeplog cluster is shown on *figure 48*.

Figure 48 – Porter's diamond for the Arjeplog cluster



Source: SÖLVELL Ö. (2008), *Clusters- Balancing Evolutionary and Constructive Forces*, Ivory Tower Publishing, Sweden, ISBN: 978-9197478335 - p.29- 38

At the beginning mainly climate, good infrastructure and knowledge about ice played a role. The entrepreneur David Sundström ran a small hydroplanes transport business and carefully created his landing strip on the local lakes which represent the largest area of water among all municipalities in Sweden. A couple of German engineers passing by asked if they could borrow the landing strip for brake testes. The next winter they returned. Well developed infrastructure with several airports in the area and good and cleared public roads made it the preferred site for winter car testing. The 'hero' of the cluster David Sundström invested in services around brake testing activities such machines to clear the ice and hotels for the incoming engineers. The other parts of Porter's diamond came slowly into play in the 1980's and 1990's. Skills and infrastructure became more advanced and Arjeplog became linked to world markets.

In conclusion it can be said that the endowments, macroeconomic and microeconomic conditions must be in balance to enhance cluster competitiveness.

5.2. Cluster identification and mapping

Before being mapped, clusters need to be identified which is not always easy as many of them don't have a cluster management or even a website. *Appendix 11.1- Figure I* shows a summary of results from national studies attempting to map clusters. There are many different methods with each having advantages and limitations.

Sternberg and Litzenberger (2004) developed a more quantifiable measure to identify clusters. The Cluster Index represents the product of the relative industrial density (ID), the relative industrial stock (IS) and the relative size of the companies (SB). A beginning regional specialisation can be identified if the cluster index value is greater than one, but the critical value for the existence of a cluster is four. The authors admit that no exact threshold exists but this measure is good as a starting point in identifying clusters. [97]

$$Cluster\ Index = ID_{ij}\ x\ IS_{ij}\ x\ \frac{1}{SB_{ij}} = \frac{\frac{e_{ij}}{\sum_{i=1}^{n} e_{ij}}}{\frac{i_i}{\sum_{i=1}^{n} i_i}}\ x\ \frac{\frac{b_{ij}}{\sum_{i=1}^{n} b_{ij}}}{\frac{a_i}{\sum_{i=1}^{n} a_i}}$$

j = sector
i = region
e_{ij} = number of employees
b_{ij} = number of enterprises
a_i = size of the region
i_i = inhabitants of the region

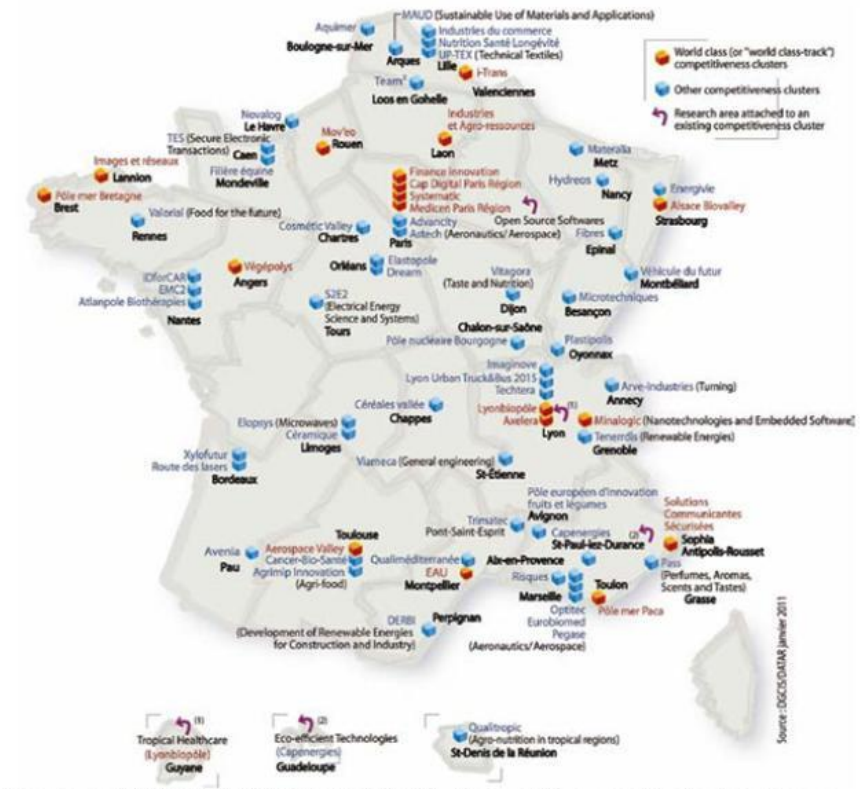
Mapping clusters is a relatively new approach to derive a better understanding of cluster's economic performance. Some countries mapped their clusters in order to adapt better cluster policies. The French government classified clusters them into global poles, poles on the track to become global and national poles. In total 73% are SMEs in clusters. (*Figure 49)* Mapped are however only cluster organisations and by consequence not all clusters. Other countries such as Germany[98] or Hungary[99] also mapped their cluster.

[97] FREIE UNIVERSITÄT BERLIN (2007), *Potential to Network Innovative Clusters in the Baltic Metropoles Regions- Present State and perspectives*

[98] KOMPETENZNETZE DEUTSCHLAND (January 2009), *Cluster Management Excellence- Volume 1: Network Services*, Federal Ministry of Economics

[99] EUROPE INNOVA CLUSTER MAPPING (25.11.2005), *Biosciences Clustering efforts in Budapest, Hungary*

Figure 49 – France cluster mapping



Source: FRENCH GOVERNMENT (2009), *Competitiveness Clusters in France*, Les poles de competitivité

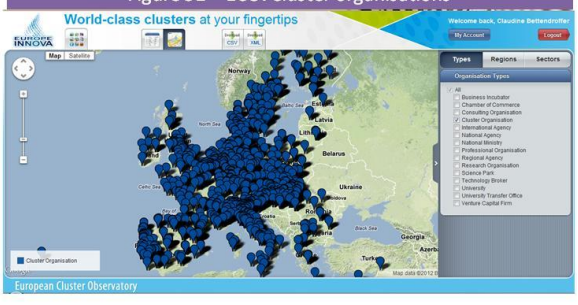
A good mapping tool for clusters has been developed by ECO based on concentrated employment rates. It is actually a further development of the US Cluster Mapping project[100] created by the Institute for Strategy and Competitiveness of the Harvard Business School.

Figure 50 shows an overview of the cluster mapping tool of the ECO, which identified more than 2000 regional clusters in 258 NUTS2 regions. The ECO does not enable the mapping of each single cluster but only statistics based on administrative boundaries. It however enables the mapping of cluster organisations shown in *figure 51*.

Figure 50 – ECO: Clusters

Source: ECO: http://www.clusterobservatory.eu/index.html#!view=regionalmapping;i=V16140;y=2009;r=NC10;rsl=0;rp=NC10;s=CC20-STND;sp=CC20-STND;p=map;ll=51.490185,19.771875;z=4 (21.07.2012)

Figure 51 – ECO: Cluster organisations



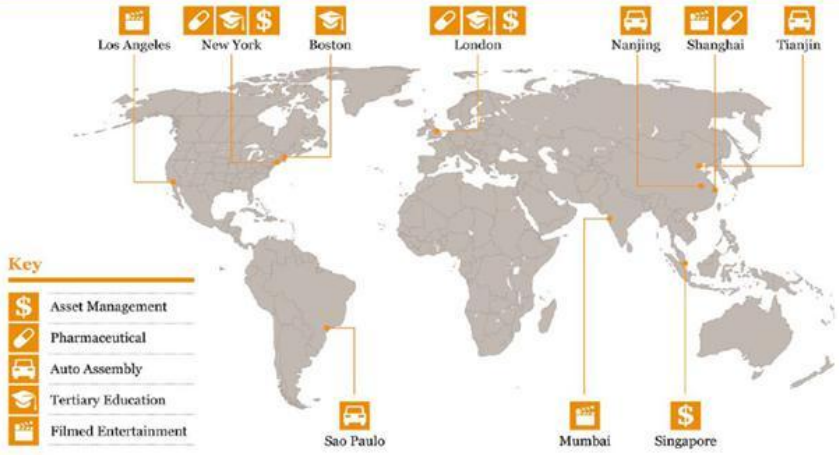
Source: ECO: http://www.clusterobservatory.eu/index.html#!view=organizationalmapping;t=CO;r=CR10-EU27;rsl=0;rp=CR10-EU27;p=map;ll=52.034155,19.156641;z=4 (21.07.2012)

[100] For more information see http://clustermapping.us/index.html

The data of the ECO has the advantage that it is continuously updated and has a consistent methodology across all EU countries. The disadvantage is that the data is too much focussed on employment data and can miss growing clusters, emerging industries or research intensive clusters with less employees but critical economical size. Biotechnology clusters for example have only a few highly paid employees who create significant value. ECO as also the US, Canada and India are feeding data to the Global Cluster Observatory[101]. The goal is to provide one day cluster mapping data of the whole world.

PriceWaterhouse Coopers developed a tool to map the largest clusters in 2040 across the world in five key industries. (*figure 52*) Unfortunately there is only London left in the EU as PwC expects a shift of all major activity to the emerging markets showing again the need to improve cluster competitiveness in the EU.

Figure 52 – Largest clusters in 2040



Source: PRICEWATERHOUSE COOPERS (September 2010), *See the future- Top industry clusters in 2040 revealed*

These mapping tools are really important for clusters, which wish to find suitable partner clusters for collaboration. It allows also comparability across regions and sectors leading to benchmarking studies of clusters.

5.3. Cluster benchmarking

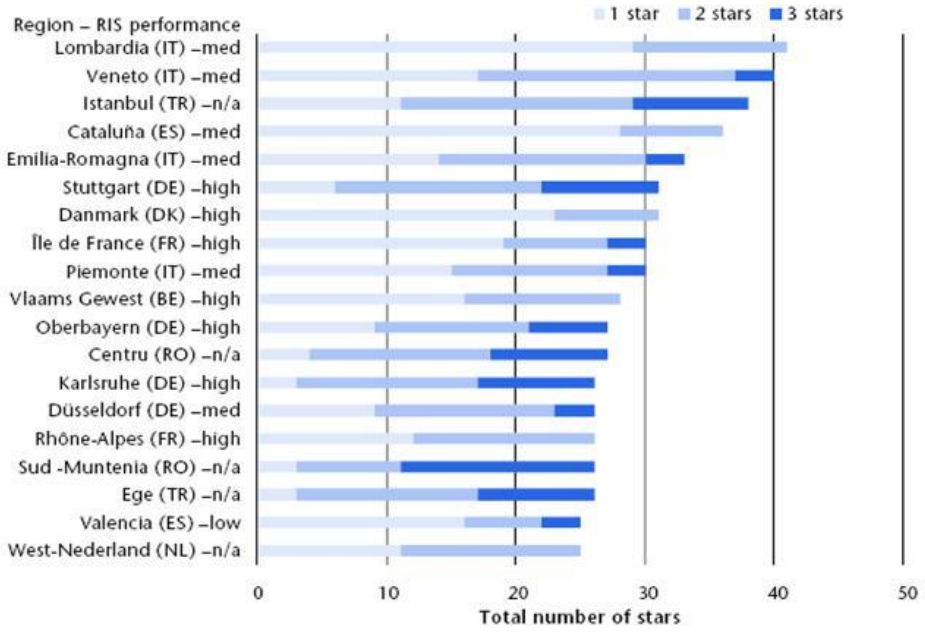
It is essential to participate in benchmarking studies of clusters as this will reveal strengths, weaknesses, opportunities and threats (SWOT anaylsis) of a cluster. Compared to other clusters it can be seen if they need improvement or are growing well. It will also help specialising as a cluster cannot be good in everything.

Clusters benchmarks indicators could be cluster size such cluster output and input; average wages in the cluster, the degree of specialisation, the number of patents and scientific publications or R&D expenditure. *Appendix 11.1.- Figure K* gives an overview on indicators used in the European Secretariat for Cluster Analysis (ESCA) benchmarking. Based on an interview with the cluster, 36 different indicators are analysed and a final report is produced on the competitiveness of the cluster. 178 clusters from 16 countries have until now been benchmarked.

[101] More information on : http://www.clusterobservatory.org/

The ECO benchmarks clusters by ranking the different cluster according to size (number of employment), specialisation (number in a sector of employment) and focus (larger share of a region's employment). Maximum 3 stars can be given to a cluster based on this ranking. 8% of all clusters had three stars, 26% two stars and 66% one star.[102] *Figure 53* shows the most successful regions in the EU.

Figure 53 – European regions by cluster portfolio strength



Source: EUROPE INNOVA & PRO INNO (2007), *Innovation clusters in Europe: A statistical analysis and overview of current policy support*, paper n.5, Office for Official Publications of the European Communities, ISBN: 978-9279072895

A ranking of clusters for each country derived from the ECO data[103] and a ranking of cluster strengths in the ten new member states[104] can be found in Europe INNOVA papers. The benchmarking focuses again too much on employment data and naturally all big capitals are on top of the ranking.

McKinsey in cooperation with the **World Economic Forum** benchmarked innovation clusters around the world based on their growth and diversity dynamics. Over 700 variables were analysed to identify trend to success stories. In *figure 54* all clusters for Europe are shown with reference to some foreign innovation clusters. Hot springs are small and fast growing hubs which can become world players. Dynamic oceans consist of large vibrant ecosystems with continuous creation and destruction of businesses. Silent lakes are older and slower-growing hubs with a narrow range of large established firms and shrinking pools find themselves slowly migrating down the value chain.

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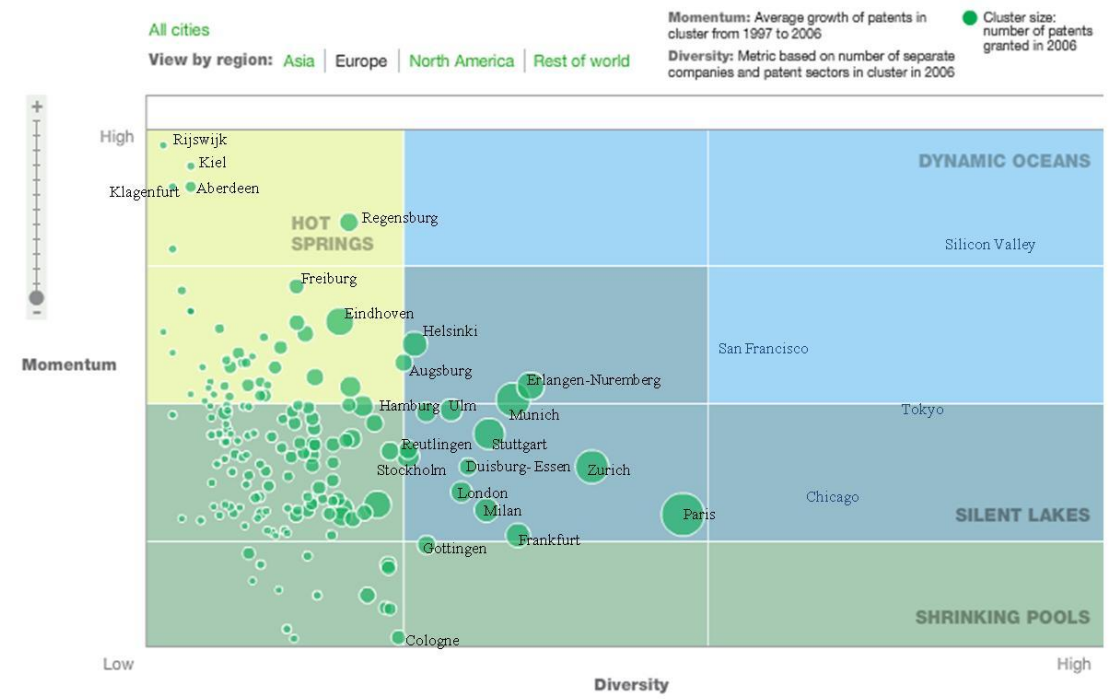
[102] EUROPE INNOVA & PRO INNO (2008), *The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned Union*, paper n.9, Office for Official Publications of the European Communities, ISBN: 978-9279098383

[103] EUROPE INNOVA & PRO INNO (2007), *Innovation clusters in Europe: A statistical analysis and overview of current policy support*, paper n.5, Office for Official Publications of the European Communities, ISBN: 978-9279072895

[104] EUROPE INNOVA – KETELS C. & SÖLVELL Ö. (2006), *Innovation clusters in the 10 new member states of the European Union*, paper n.1, Office for Official Publications of the European Communities, ISBN: 92-79031961 p. 36

Figure 54 – Mapping innovation clusters



Source: ANDONIAN A. & LOOS C. & PIRES L. (04.03.2009), *Building an innovation nation*, McKinsey & Company, http://whatmatters.mckinseydigital.com/innovation/building-an-innovation-nation (12.07.2012)

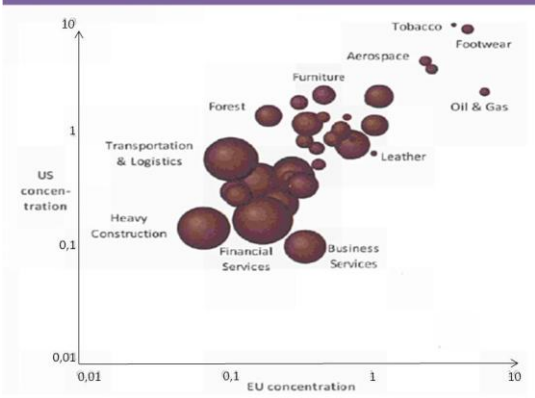
It is not only important to compare clusters within Europe but also to compare them to the rest of the world as it provides an excellent insight view of the international cluster landscape.[105] If clusters of the EU want to become world-class they also need to be competitive against international clusters.

As the US is the most similar economy to the EU, a comparison of clusters will be done. *Figure 55* shows that the average region in Europe is less concentrated than the average region in the US. Out of 38 sectors analysed, 32 are geographically concentrated in the US compared to Europe. By consequence the degree of specialisation is less strong in Europe than in the US. Translating this to employment shares, it can be seen that Europe top regions have less employment than the US top regions. (*figure 56)* Especially IT activities have in Europe a low level of regional concentration and Europe lags on average behind the US in terms of cluster strengths. Europe's share of employment in strong clusters is a quarter lower than in the US. [106]

[105] TACTICS (2011), *Cluster Internationalisation Handbook*, Case study 4

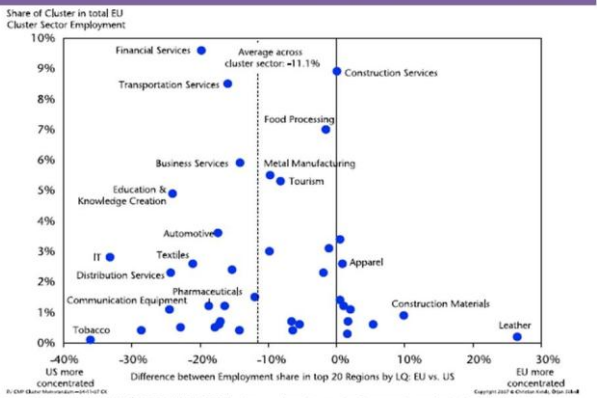
[106] EUROPE INNOVA & PRO INNO (2008), *The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned Union*, paper n.9, Office for Official Publications of the European Communities, ISBN: 978-9279098383

Figure 55 - Regional concentration of EU clusters compared to the US



Source: EUROPE INNOVA & PRO INNO (2008), *The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned Union*, paper n.9, Office for Official Publications of the European Communities, ISBN: 978-9279098383

Figure 56 –Employment concentration in strong clusters by cluster category



Source: EUROPE INNOVA & PRO INNO (2007), *Innovation clusters in Europe: A statistical analysis and overview of current policy support*, paper n.5, Office for Official Publications of the European Communities, ISBN: 978-9279072895

Possible explanations for this weak performance could still be the weak European market integration, barriers to cross-regional competition or the slower emergence of new industries. So European clusters need to become more competitive and overcome barriers.

5.4. Cluster examples

In order to complete the picture of clusters in the EU some clusters from specific sectors and from specific geographic locations will be analysed.

5.4.1. Sector specific clusters

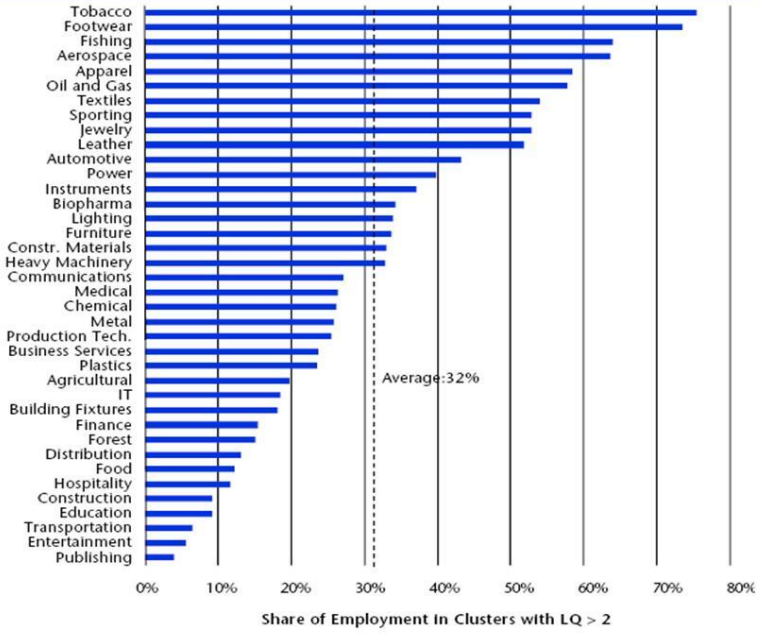
The understanding and knowledge of cluster specific framework conditions for different sectors and especially emerging industries are still limited even though it is important to analyse specialisation patterns and their focus across Europe.

Major sectors doing well everywhere in the EU are those supported by the Lead Market initiative (e-health, sustainable construction, protective textiles, bio-based products, recycling and renewable energies) initiated by the EC. Other sectors doing well include the KETs (Key Enabling Technologies) such as nanotechnology, advanced materials or photonics.

More specifically Polt et al. (2001) identified three main groups of countries in the EU. First, there are the high technology specialised countries such as Finland or Sweden; second, countries with a cumulative path of technology development along traditional technology trajectories such as Belgium, Germany or the UK and finally there are countries focussing on fast-follower strategies in technology diffusion in traditional industries and niche market strategies such as Austria, Ireland or Italy.

Actually the level of employment concentration differs significantly across cluster categories in the EU. *Figure 57* shows that employment in sectors with small overall number of employees such as footwear and aerospace is concentrated in a few clusters whereas employment in construction or education is much more dispersed across the EU.

Figure 57 – Geographic concentration of employment by cluster category



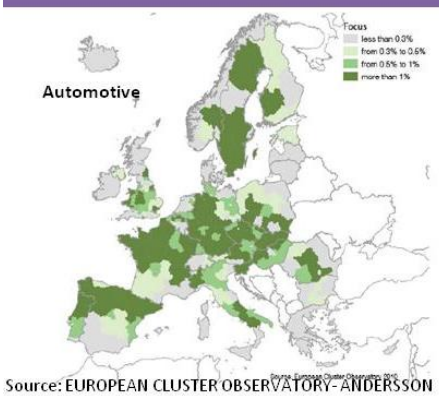
Source: EUROPE INNOVA & PRO INNO (2007), *Innovation clusters in Europe: A statistical analysis and overview of current policy support*, paper n.5, Office for Official Publications of the European Communities, ISBN: 978-9279072895

The following nine sectors are chosen by hazard and should only give an indication which regions have specialised clusters in which sectors. The regional focus for each of these sectors is displayed in *figure 58*. Two strong sectors in the EU are the Automotive sector in which clusters show clear regional specialisation patterns[107] and the Maritime sector as European ship owners control almost 40% of the world fleet.[108]

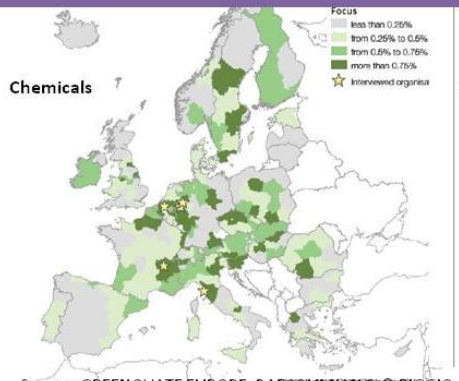
[107] HESSEN AGENTUR & EUROPE INNOVA (2008), *Automotive Clustering in Europe*, ISBN: 978-3932845772

[108] EUROPEAN COMMISSION (2008), *the role of Maritime Clusters to enhance the strength and development in European maritime sectors- Executive Summary*, Office for Official Publications of the European Communities, ISBN: 978-9279115592

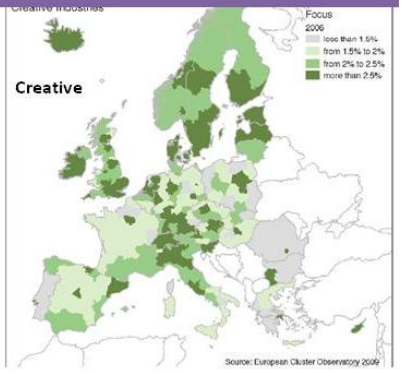
Figure 58 – Regional focus of different sectors



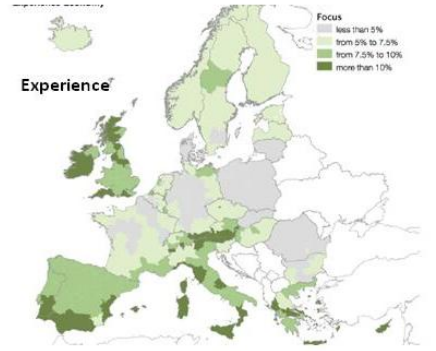
Source: EUROPEAN CLUSTER OBSERVATORY- ANDERSSON N. & ANNERSTEDT J. (20.12.2010), *Priority Sector Report: Clusters in the Mobility industry: Automotive and Tourism Sectors*



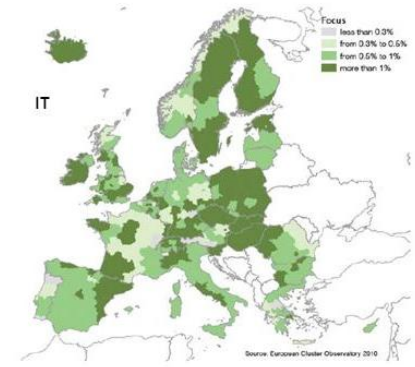
Source: GREENOVATE EUROPE- BARSOUMIAN S. & RIGGIO R. & SEVERIN A. & VAN DER SPEK T. (01.07.2011), *Eco-innovation in cluster organizations in the chemical and textile-clothing-leather sectors*



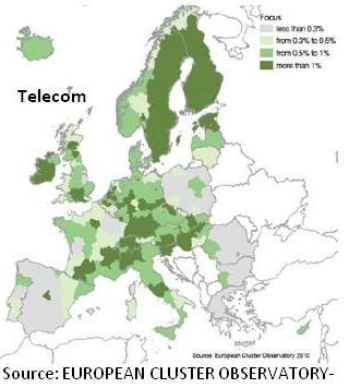
Source: EUROPEAN CLUSTER OBSERVATORY- POWER D. & NIELSEN T., (March 2011), *Priority Sector Report: Creative and Cultural Industries*



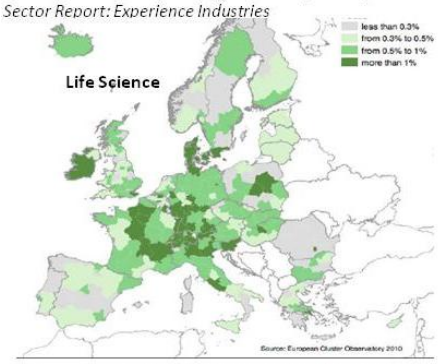
Source: EUROPEAN CLUSTER OBSERVATORY- LINDQVIST G. & PROTSIV S., (17.10.2011), *Priority Sector Report: Experience Industries*



Source: EUROPEAN CLUSTER OBSERVATORY- ANDERSSON N. & ANNERSTEDT J. (20.12.2010), *Priority Sector Report: Clusters in the Mobility industry: Automotive and Tourism Sectors*

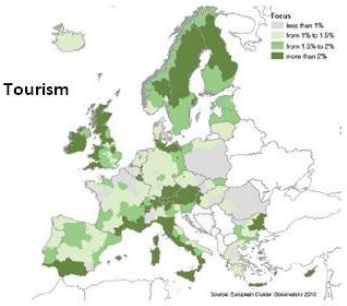


Source: EUROPEAN CLUSTER OBSERVATORY- ANDERSSON N. & ANNERSTEDT J. (20.12.2010), *Priority Sector Report: Clusters in the Mobility industry: Automotive and Tourism Sectors*



Source: EUROPEAN CLUSTER OBSERVATORY- GIOVACCHINI E., (May 2011), *Priority Sector Report: Life Science*

Source: EUROPEAN COMMISSION (2008), *the role of Maritime Clusters to enhance the strength and development in European maritime sectors- Executive Summary,* Office for Official Publications of the European Communities, ISBN: 978-9279115592

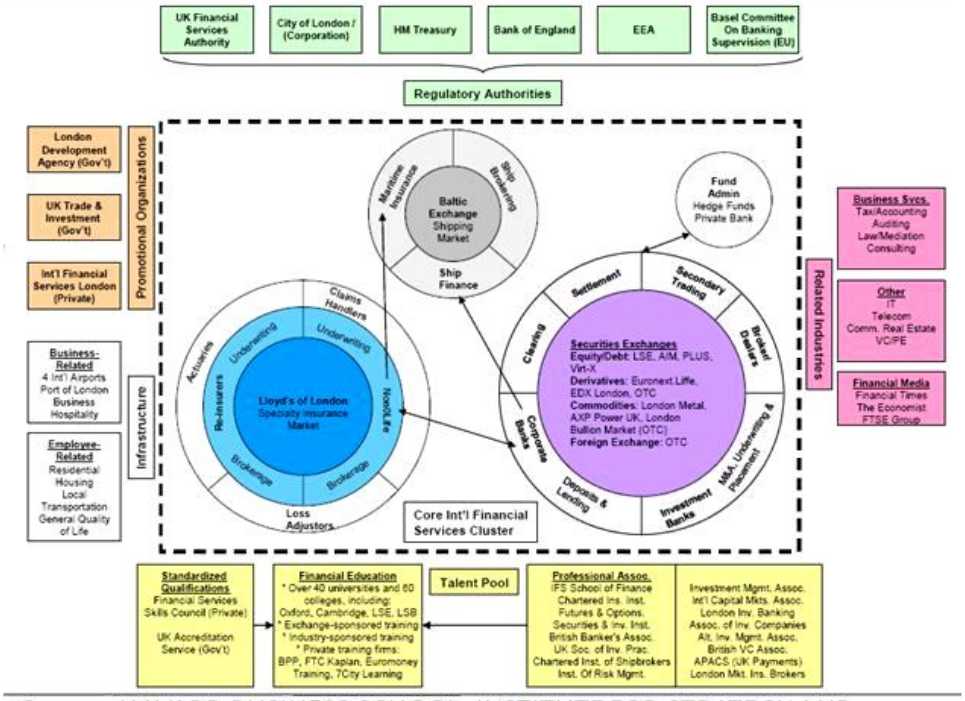


Source: EUROPEAN CLUSTER OBSERVATORY- ANDERSSON N. & ANNERSTEDT J. (20.12.2010), *Priority Sector Report: Clusters in the Mobility industry: Automotive and Tourism Sectors*

5.4.2. Geographic specific clusters

Clusters have different geographical boundaries. **Cities** are often not only composed by one cluster but by many clusters from different sectors. Mostly cities are however known for their biggest cluster such as Stuttgart and Wolfsburg for cars and Stockholm for IT and Telecom. Even London is known for financial services but involves also actors from other sectors. (*Figure 59*)

Figure 59 – London Financial cluster map

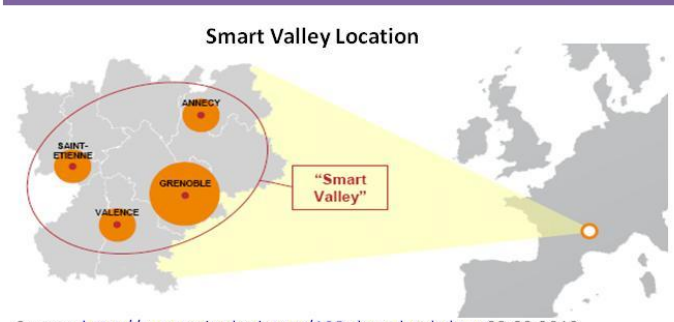


Source: HAVARD BUSINESS SCHOOL- INSTITUTE FOR STRATEGY AND COMPETITIVENESS (2007), *UK Competitiveness and the International Financial Services Cluster in London*

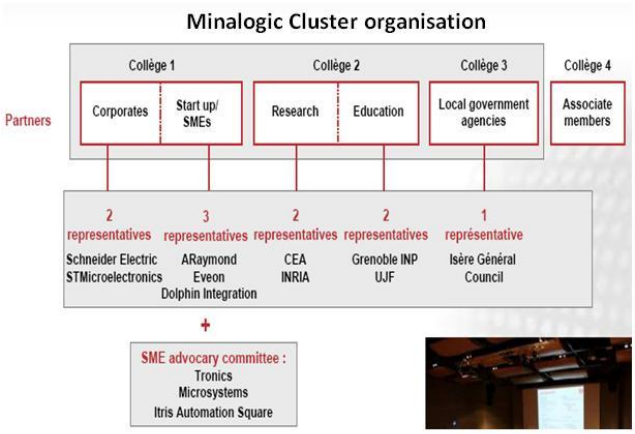
Famous **regional clusters** are often based on their resources such as the Rioja region or the Bordeaux region, are known for their wines. A regional cluster based on other factors is the Grenoble Smart Valley. The Rhône-Alpes region being the second largest regional economy after Paris- Ile de France, Grenoble's ecosystem is particularly favourable for clusters as it includes 18 competitive poles. One of the three leading clusters in the world in its sector is the cluster Minalogic specialising in micro- and nanotechnology, IT and software.[109] Since its creation in 2005 it certified 220 projects for a total funding of €615 million. With 52 founding members, Minalogic developed to a big cluster with 204 current members. It also has a governance structure which enables the representation of all cluster firms, research, university and government. (*Figure 60*)

[109] EUROPE INNOVA CLUSTER MAPPING (31.03.2008), *Microelectronics clustering efforts in Grenoble*

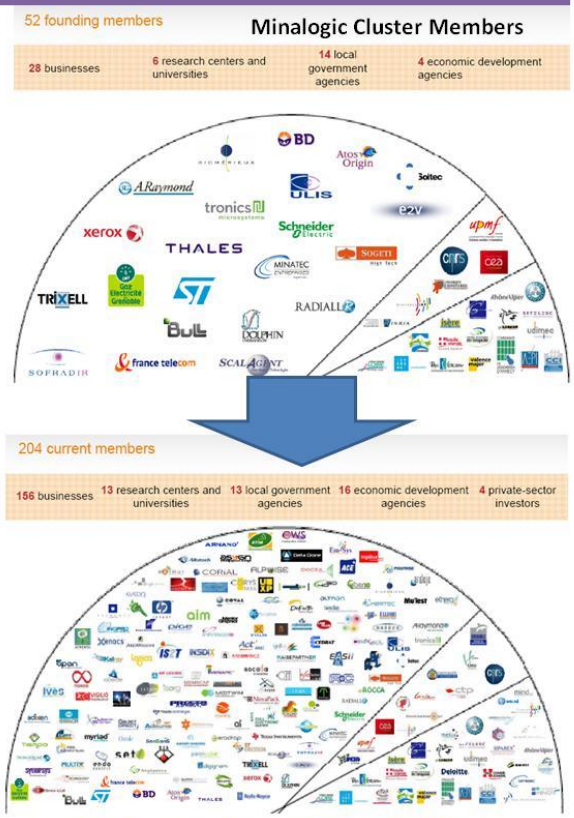
Figure 60 – Smart Valley & cluster Minalogic



Source: http://www.minalogic.org/108-downloads.htm 03.08.2012



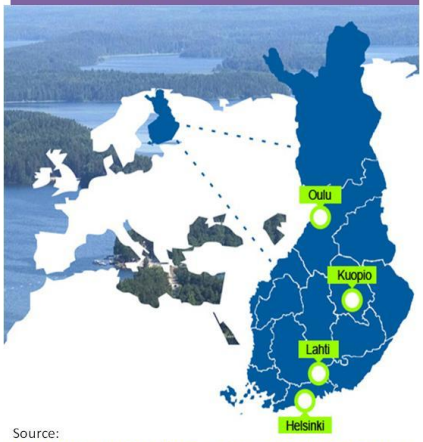
Source: http://www.minalogic.org/108-downloads.htm 03.08.2012



Source: http://www.minalogic.org/108-downloads.htm 03.08.2012

National clusters are for example Switzerland which is famous for watches, the Netherlands famous for their flowers, Switzerland and Belgium for their chocolate, Finland for their forest industry[110]or the Finish Cleantech cluster bringing together leading experts from across Finland (*Figure 63*).

Figure 63 – Finish Cleantech Cluster



Source: http://www.hightech.fi/direct.aspx?area=htf&prm1=876&prm2=article (28.07.2012)

A variety of **cross-border regional clusters** exits. If a cluster is spread over different regions it can also be called Supercluster and if it is spread over regions from different countries it can be called

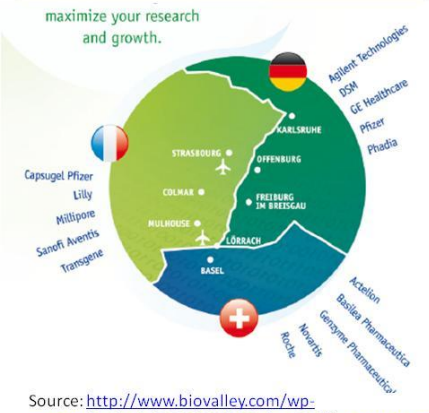
[110] EUROPE INNOVA (January 2008), *Case studies of clustering efforts in Europe: Analysis of their potential for promoting innovation and competitiveness*, draft distributed in the European Presidential Conference on Innovation and Clusters, Stockholm 22-23 January 2008

Megacluster. A good example of a Megacluster is the Medicon Valley in the Öresund region (*Figure 61)* which stretches over Sweden and Denmark. It is one of Europe's strongest life science clusters and comprises today 442 companies, 10 universities and 30 hospitals. They set up an Academy helping contacts across the border diffusing information and knowledge more easily. A cluster comparable to the Medicon Valley is the Biovalley located in the Upper Rhine Region (*figure 62*) which networks 600 life science companies, 10 universities, 10 technology platforms and 11 life science parks across three different countries, France, Germany and Switzerland.

Figure 61– Medion Valley in the Öresund region

Source: http://www.mediconvalley.com/ (17.07.2012)

Figure 62 - Biovalley



Source: http://www.biovalley.com/wp-content/uploads/2012/05/BAT-plaq-BV-bien-montee.pdf, 03.08.2012

There are no examples of **European clusters** or **international clusters**. The whole EU is for example not specialised in one product and famous for it. One paper suggested that Europe is famous for Scooters but there is no cluster in it which would have activities in most of the European countries. There are however many clusters in the EU which have a European or even international reach by collaborating with other clusters.

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6. CLUSTER COOPERATION IN THE EU

It is clear that one cluster alone is unlikely to have enough weight on the European or international stage as it lacks critical mass to compete in markets that reach beyond their region. The only way to increase their competitiveness is by reaching out and growing linkages to other clusters.

6.1. Stages of cluster cooperation

Cluster cooperation is normally evolving by three main stages, moving up stages as time is passing by and trust between the different actors is build.

6.1.1. 1st stage: Cluster share of experiences and knowledge

The objective is to develop a culture of mutual exchange which involves sharing experiences and knowledge. Companies and other cluster actors get involved, but cooperation is kept informal. Several conferences such as the European Cluster Conference 2012 and seminars, workshops, forums and shows are throughout the year to push the exchange of experiences and knowledge. The Stuttgart Region Economic Development Corporation managing the automotive cluster organises regular events called 'matchmaking events' outside of the cluster as for example with the Pannon Automotive Cluster in Hungary, the Mov'eo cluster in France and Lombardy in Italy.[111]

6.1.2. 2nd stage: Cluster cooperation

The second stage considers a cooperative culture by setting up for example a joint proposal. Here cooperation is more tending to coordination with an operational purpose. The objective is to build critical mass in order to carry out joint research projects or to design innovative products. [112] Dresden and Grenoble semiconductor clusters collaborate since March 2010 by initiating joint initiatives in selected areas and by attracting more attention and support from European Authorities through a joint lobbying process.[113]

6.1.3. 3rd stage: Cluster community

The third stage consists of a more trusted cooperation. A community culture is acquired and a permanent consortium is set up. Common strategic issues are essential for a structured partnership aiming at entering markets which would be individually inaccessible. The concept of **intercluster** as an association of clusters within a specific interregional or transnational area engaging in processes aimed at common strategic development, is here in its most developed and complete form.[114] The objective is to promote synergies around high-value-added products and services, and thereby contribute to the emergence of European industrial projects.[115] The intercluster ARRR is formed by chemical clusters in three regions: Antwerp, Rotterdam and Rhine-Ruhr. It can be considered as the

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[111] GRENOBLE ECOLE DE MANAGEMENT (2011), *The Automotive Cluster in Stuttgart*

[112] Intercluster : http://www.intercluster.eu/index.php?option=com_content&view=article&id=13&Itemid=2&lang=en (18.05.2012)

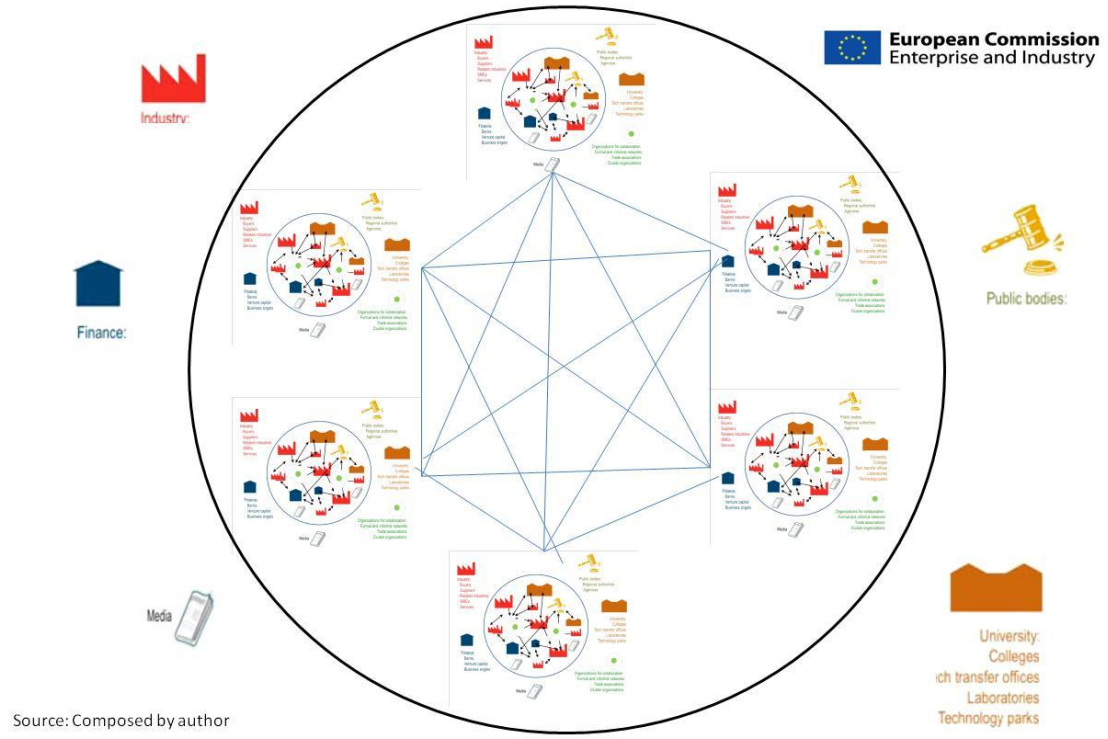
[113] MINATEC- ASTIER A. (16.09.2011), *Initiative de Coopération entre les Clusters en Microélectronique de Grenoble et de Dresde*

[114] Intercluster : http://www.intercluster.eu/index.php?option=com_content&view=article&id=13&Itemid=2&lang=en (18.05.2012)

[115] Intercluster : http://www.intercluster.eu/index.php?option=com_content&view=article&id=13&Itemid=2&lang=en (18.05.2012)

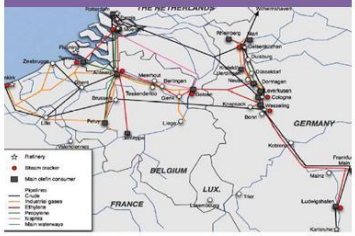
largest interconnected chemical production cluster in the world in terms of production throughput. [116] So an intercluster is a cluster of clusters which collaborate. (*Figure 64*)

Figure 64– World-class clusters / Interclusters



Source: Composed by author

Example– ARRR cluster



Source: THE EUROPEAN PETROCHEMICAL ASSOCIATION (August 2007), *A paradigm shift: Supply Chain Collaboration and Competition in and between Europe's Chemical clusters*

This progress towards greater integration is stated in the White paper (2010) as the 'path towards world-class status.' Only the ability to harmonise a 'cooperative approach between numbers of European clusters may give birth to a true European world-class cluster.' By consequence World-class clusters are not only clusters with an excellent performance but can be considered as interclusters. However world-class clusters will also need a European management team 'capable of dealing with the world's largest clusters on an equal-to-equal basis.'[117]

[116] THE EUROPEAN PETROCHEMICAL ASSOCIATION (August 2007), *A paradigm shift: Supply Chain Collaboration and Competition in and between Europe's Chemical clusters*

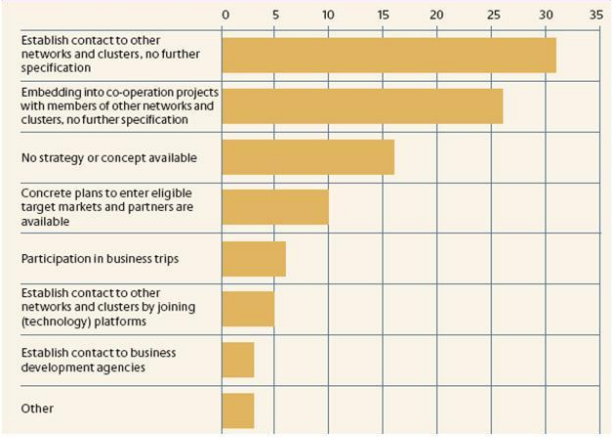
[117] EUROPA INTERCLUSTER (2010), *White Paper- The Emerging of European world-class clusters*, http://www.intercluster.eu/index.php?option=com_flexicontent&view=items&cid=1:frontpage&id=159:release-of-the-white-paper-on-the-emerging-of-world-class-clusters&Itemid=1

6.2. Journey to cluster cooperation

So how do clusters internationalise and reach world-class status? The term internationalisation is very complex and is hereby used mainly for clusters willing to establish relations with clusters from other countries.

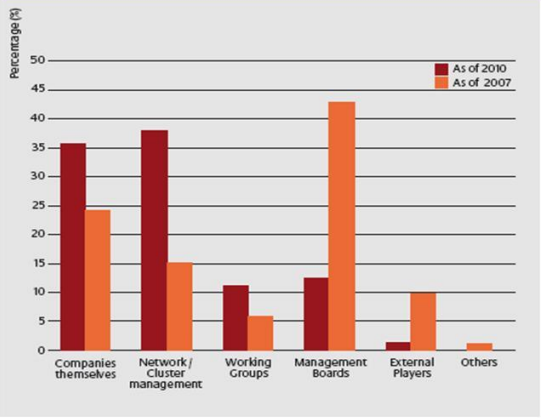
A survey from the German Competence Networks showed that only 10% of cluster initiatives or networks actually have concrete plans for internationalisation, which is regarded as a key success factor for internationalisation. *(Figure 65)* It is also difficult for clusters to internationalise without a cluster organisation as the responsibilities for internationalisation tended to be put on the cluster manager and management boards. In 2010, this changed as 36% see the responsibility of companies themselves as crucial. (*Figure 66*)

Figure 65 – Internationalisation strategies of clusters



Source: KOMPETENZNETZE DEUTSCHLAND (September 2007), *Internationalization of Networks- Barriers and Enablers,* Federal Ministry of Economics

Figure 66 – Responsibilities regarding internationalisation in 2007 and 2010



Source: INSTITUTE FOR INOOVATION AND TECHNOLOGY, *European Clusters go international- Networks and clusters as instruments for the initiation of international business cooperation*

To facilitate this internationalisation process of clusters, Tactics produced a handbook on cluster internationalisation[118] in which international cluster cooperation is evolving by ten steps. (*Figure 67*)

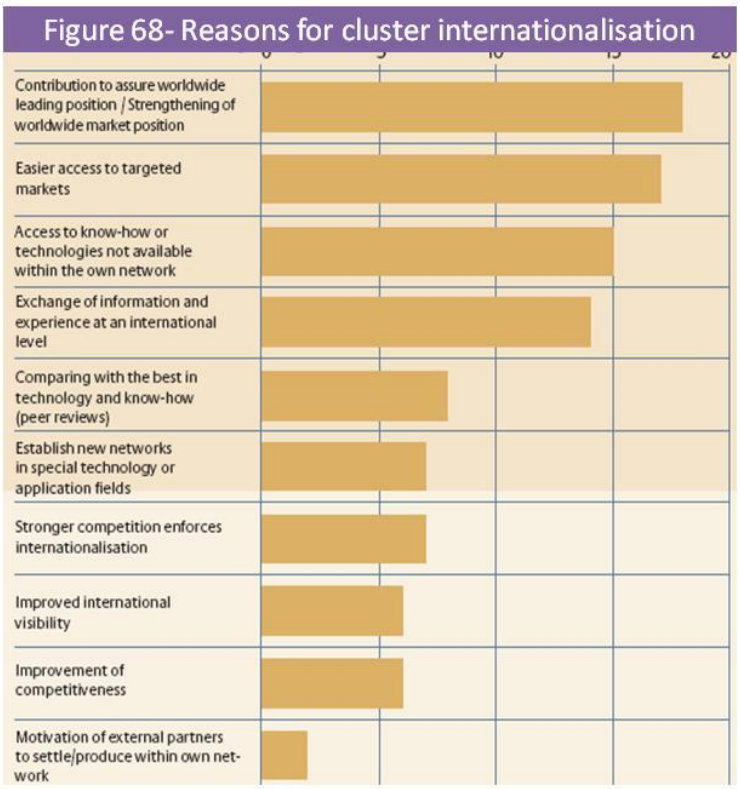
Figure 67 – International cluster cooperation steps

Source: TACTICS (2011), *Cluster Internationalisation Handbook*

[118] TACTICS (2011), *Cluster Internationalisation Handbook*

STEP 1: First a cluster needs to know the benefits of internationalising. The ECPG (2010) wrote in its final recommendations that 'collaboration between clusters can yield many benefits including expanded international linkages and global value chains, and strengthened cross-fertilization and dynamism.'[119]

Clusters are the best example that firms can compete and collaborate at the same time in order to be more competitive. Cluster collaboration takes this concept to a new level as clusters can compete and collaborate at the same time. Many reasons for being part of a cluster can be transferred to reasons to collaborate with other clusters.[120] In the cooperation of clusters the economies of scale generated are more important. *Figure 68* shows some of the major reasons for internationalisation of clusters.



Source: KOMPETENZNETZE DEUTSCHLAND (September 2007), *Internationalization of Networks- Barriers and Enablers,* Federal Ministry of Economics

The most common is the collaboration of clusters with complementary activities. 'Creating stronger linkages between clusters in different locations which offer complementary strengths is the only way that access to the most advanced technologies and best know-how may often be found.' (ECPG, 2010)[121] As our world is moving towards an era of hyper specialisation: 'as labour becomes more knowledge based and communications technology advances, the division of labour accelerates' (Malonet, 2011)[122], it is more important to collaborate than ever before.

[119] EUROPEAN CLUSTER POLICY GROUP (2010), *Final recommendations- A call for Policy Action*, http://www.proinno-europe.eu/ecpg/newsroom/ecpg-final-recommendations
[120] Cf. 3.5. Clusters as drivers for innovation
[121] EUROPEAN CLUSTER POLICY GROUP (2010), *Consolidated Set of Policy Recommendations on Four Themes*, http://www.proinno-europe.eu/ecpg/newsroom/ecpg-final-recommendations
[122] MALONE T. (July- August 2011), *THE BIG IDEA: the age of hyperspecialization*, Havard Business Review, p.56-65

STEP 2: A diagnostic tool to assess this readiness for internationalisation has been developed and the questions asked for cluster organisations and policy makers can be found in the handbook.[123]

STEP 3: To identify opportunities benchmarks are essential. Information on potential partners can also be found out on several platforms and networking events in the EU. A good tool to know the position of the cluster can be the Boston Strategy Matrix[124].

STEP 4: Tactics produced a generic cluster internationalisation strategy and action plan for cluster organisation and for policy makers in the EU.[125] It mainly describes how the identified opportunities in step 3 will be realised.

STEP 5: In order to assess the gaps training courses and material is essential. The handbook provides useful information where cluster organisations and policy makers can find information on trainings.[126]

STEP 6: A key element of identifying partners is to build strong interpersonal relations and shared values between organisations and individuals.

STEP 7: Developing trust and projects which cover all collaborations between clusters takes time and considerable commitments of people and finances.

STEP 8 consists in implementing those projects.

STEP 9: Measuring success is a continuous process and it is essential to monitor not only the short term but also the longer term benefits.

STEP 10: The last step consists in sustaining the networks build. In time they need to be self-financing and care needs to taken to manage potential conflicts in the network.

There are some other factors which need to be taken into account. The structure of the internal organisation of the cluster collaboration is important. EICOSE, the European Institute for Complex Safety Critical Systems Engineering is an organization representing three major clusters, the Aerospace Valley, SafeTRANS and Sytematic Paris-Region and a few associated members and each cluster has one person in the executive board of EICOSE to ensure correct representation. (*Appendix 11.1.- Figure J*) Another factor is the access to finance. Funding during the internationalisation process varies according to the different stages they are in. At the beginning less funding is usually required and more is needed for the later stage. Getting the necessary funding can be difficult and can represent a barrier to collaboration.

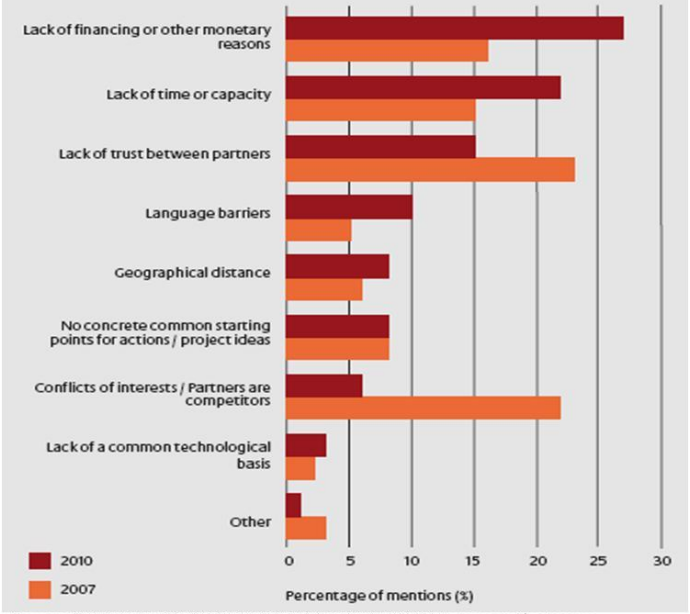
[123] TACTICS (2011), *Cluster Internationalisation Handbook*, Appendix B
[124] Cf. 13. Glossary- Boston Strategy Matrix
[125] TACTICS (2011), *Cluster Internationalisation Handbook*, Appendix D
[126] TACTICS (2011), *Cluster Internationalisation Handbook*, Appendix E

6.3. Barriers to cluster cooperation

Many barriers are in place in the EU as otherwise cluster collaboration would already exist much more.

Collaboration between clusters is only happening if there is knowledge between potential partner clusters and their capabilities. As such the ECO was established to collect statistical data about clusters and many networking conferences are organised in the EU. However it is still difficult for clusters to find partner clusters and to risk the step of trusting another cluster enough to collaborate. The lack of trust between partners has been one of the number one barriers to trans-national cooperation. In 2010 it tends to be more the lack of financing reason. (*Figure 69*)

Figure 69 – Barriers to international cooperation between clusters



Source: INSTITUTE FOR INOOVATION AND TECHNOLOGY, *European Clusters go international- Networks and clusters as instruments for the initiation of international business cooperation*

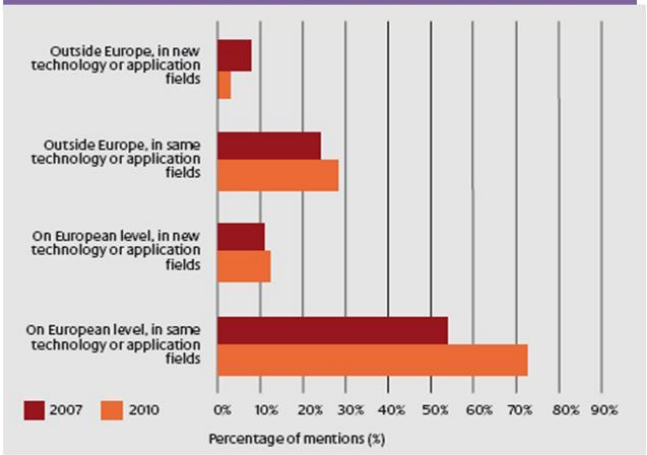
So a weakness in the EU is the poor access to finance from venture capital firms but also ineffective public procurement. Europe has a slow standardisation rate which makes it more difficult for clusters to collaborate. This can be explained by a very fragmented European market. There are still many barriers to trade and mobility in place distorting the free flow of goods, people and money. As Europe is not one big country there are many barriers due to different nations. They have different languages, different legacies and different cultures. Europe has also a huge fragmentation of different cluster policies which are representing in some sort the 'cost of non-Europe'[127]. It is difficult for clusters to reconcile procedures, criteria or schedules. Added to the national cluster policies are the EU policies which in most cases don't complement the national policies.[128]

[127] EUROPA INTERCLUSTER (2010), *White Paper- The Emerging of European world-class clusters*, http://www.intercluster.eu/index.php?option=com_flexicontent&view=items&cid=1:frontpage&id=159:release-of-the-white-paper-on-the-emerging-of-world-class-clusters&Itemid=1

[128] EUROPA INTERCLUSTER (2010), *White Paper- The Emerging of European world-class clusters*, http://www.intercluster.eu/index.php?option=com_flexicontent&view=items&cid=1:frontpage&id=159:release-of-the-white-paper-on-the-emerging-of-world-class-clusters&Itemid=1

There is also a natural barrier when clusters try to cooperate with clusters from another technology or application field. *Figure 70* demonstrates that it is easier to cooperate in the same field and inside Europe.

Figure 70 - Cluster collaboration, fields & level



Source. INSTITUTE FOR INOOVATION AND TECHNOLOGY, *European Clusters go international- Networks and clusters as instruments for the initiation of international business cooperation*

'European clusters can compensate some of these comparative disadvantages through creating stronger linkages to other clusters with complementary strengths.' (Europe INNOVA, 2008)[129]

6.4. Cluster collaboration examples

Dirk Ahner from DG Regio at the EC (2012) stated that 'for clusters to reach a global dimension European regions need to work together to create the critical mass that enables them to overcome barriers and grow at global stage.'[130]

Some networks will be analysed as these have the strongest potential to become European interclusters ergo world-class cluster.

6.4.1. Sector specific networks

The most often cluster collaboration is happening within a specific sector. Some cluster networks have been initiated under a European programme as a project of some years and have now reached to an end. To create an accurate view, only all relevant European cluster networks which currently exist will be analysed.

The **European Aerospace Cluster Partnership** was established in the framework of the CLUNET project and has currently 39 members from 13 countries. (*Figure 71)* The **European Automotive Strategy Network** has followed the projects BelCAR and TCAS and regroups more than 40 automotive cluster form the EU. *(Figure 72)*

[129] EUROPE INNOVA & PRO INNO (2008), *The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned Union*, paper n.9, Office for Official Publications of the European Communities, ISBN: 978-9279098383
[130] BUSINESS EUROPE (10.2009), *Unite and innovate! European clusters for recovery*, http://www.tmforsk.no/mediafiler/fil.asp?id=955 (07.07.2012)

Figure 71- European Aerospace Cluster Partnership

Source: http://www.eacp-aero.eu/ (28.07.2012)

Figure 72- European Automotive Strategy Network

Source: Composed by author, more information can be found on http://www.easn.eu/

Two projects initiated by Europe INNOVA are the **EcoClup** which is a living network offering one-stop solution to support innovation and internationalisation of eco-innovative companies (*Figure 73)* and **ABC Europe** which networks European Agro-Biotech Clusters. (*Figure 74*)

Figure 73 - EcoClup

Source: http://www.europe-innova.eu/c/document_library/get_file?folderId=401884&name=DLFE-11473.pdf (22.07.2012)

Figure 74- ABC Europe

Source : http://www.europe-innova.eu/c/document_library/get_file?folderId=401884&name=DLFE-11472.pdf (22.07.2012)

ABC Europe led to www.toolsofscience.eu which is a gateway to life science capacities. It also led to the **Council of European BioRegions** (CEBR) launched in 2006 through FP6 to network biotechnology clusters across Europe. *Figure 75* shows the greater range of the CEBR which also extended already to Asia and the US. CEBR is using also a monitoring methodology to numerous European life sciences clusters developed by an organisation named the decision group[131].

[131] More information on http://www.thedecisiongroup.nl/

Figure 75- CEBR world connections

Source: http://www.cebr.net/global-partnerships (03.08.2012)

The **European network of Maritime Clusters** established in 2005 includes maritime clusters from Bulgaria, Denmark, Finland, France, Germany, Italy, Luxembourg, Netherlands, Norway, Poland, Spain, Sweden and UK. (*Figure 76*) The project CASTLE (Europe INNOVA) led to **ENCADRE**, the European Network of Clusters for Satellite Applications Development. (*Figure 77)*

Figure 76- European network of Maritime Clusters

Source: Composed by author, more information can be found on http://www.european-network-of-maritime-clusters.eu/member

Figure 77- ENCADRE

Source: Composed by author, more information can be found on http://www.encadre.net/

Just to give an example of global cluster collaboration in a sector, the **Global Cleantech Cluster Association** as a non-profit organisation consists of 38 global clusters which represent more than 4000 cleantech companies worldwide. [132]

GCCA GLOBAL CLEANTECH CLUSTER ASSOCIATION — THE GLOBAL VOICE OF CLEANTECH

It can be concluded that research intensive industries collaborate more in clusters and have better networks established as the most networks have been found for biotechnology and life sciences industries. The Greenpaper suggests that Europe develops regional specialisations and allows research driven clusters of global excellence emerge in order to strengthen its competitive position. 'Knowledge-based clusters of interlinked innovative enterprises and excellent research institutes could be among the main levers to foster EU competitiveness in the knowledge-based economy.' [133] (EC, 2007)

[132] More information on http://www.globalcleantech.org/about-us/

[133] DIRECTORATE-GENERAL FOR ENTREPRISE AND INDUSTRY (2007), *Innovation clusters in Europe: A statistical analysis and overview of current policy support*, Luxembourg, ISBN: 978-9279072895

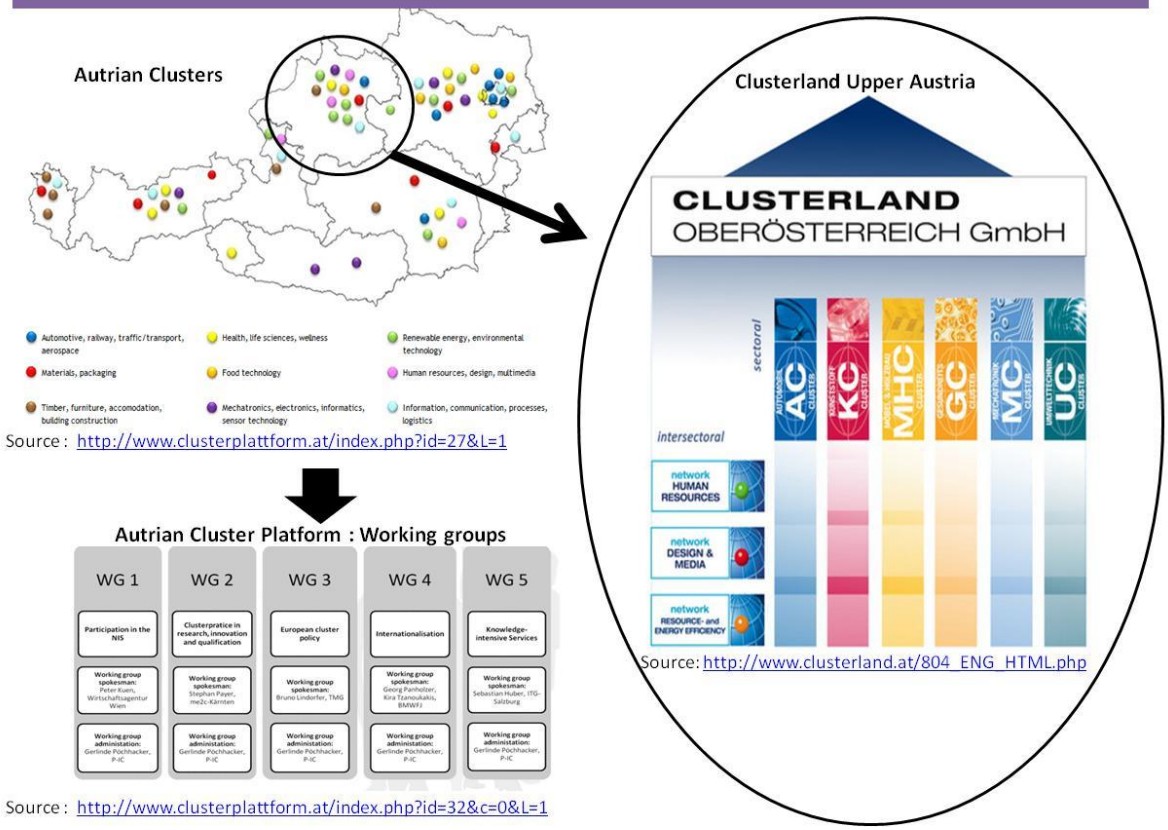
6.4.2. Geographic specific networks

Often platforms and networks are however not sectors specific but more geographically focused.

A **regional network** is Bayern Innovativ managing an automotive, an energy technology and a new materials cluster. It operates also several innovation networks in the automotive, energy, electronics and microelectronics, environmental technology, biotechnology, food and pharma, functional textiles, logistics, new materials and wood industries.

A **national network** of clusters has been established in 2008 as the Austrian Cluster Platform. It maps all clusters and has set up working groups in order to ameliorate the performance of Austrian clusters. Actually the national network is based on many regional cluster networks such as the one from Upper Austria which includes 6 major clusters. What is quite unique is that Clusterland Upper Austria has three intersectoral networks relating these clusters. (*figure 78*)

Figure 78- Austrian Cluster Platform



A **trans-national network of clusters** is in the Baltic Sea region. There is even an own EU strategy applied to these countries and it is Europe's most innovative region and is based on stable welfare systems. (*Figure 79*)

Figure 79– The Baltic Sea Region

Source: Composed by author,

Created on a **European level,** have been many platforms by Europe INNOVA and PRO INNO already presented (ECA, ECCP, European Cluster Managers Club, Cluster Innovation Platform...). These are however all top-down networks which most of the time end after the end of the project.

Europa Intercluster is however a bottom- up initiative originating from a few cluster organisations. As a non-profit body created in 2007 its membership is strictly restricted to clusters and it is focussing on cluster collaboration across Europe to create interclusters. [134]

europa INTERCLUSTER
EUROPEAN PLATFORM FOR CLUSTER COOPERATION

EU–Japan Centre
for Industrial Cooperation

An example of **international cluster collaboration** is the EU- Japan Centre for Industrial Cooperation providing a helpdesk for EU and Japanese clusters. [135]

On a **global level** the competitiveness institute (TCI) is quite successful as it is setting up the most important conference for linking clusters all over the world. It is also the leading global network for practitioners, policy makers, researchers and business leaders working towards improving competitiveness in regions and clusters. As a non-profit and non-governmental organisation, TCI is financed through annual membership fees and consist currently of 3000 leading practitioners from over 100 countries. [136]

TCI

As these clusters collaborations are however only based on theory and examples, they don't define a quantifiable measure and by consequence further research is needed.

[134] More information can be found on http://www.intercluster.eu/
[135] More information can be found on http://www.eujapan.com/ (20.07.2012)
[136] More information can be found on http://www.tci-network.org/

7. RESEARCH

Research in several publications related to clusters is not enough to answer the question, if cluster collaboration is making the EU more competitive and is the right way towards the future. They create a good unbiased and objective basis but a deeper research needs to be conducted.

7.1. Methodology

Currently more and more data on clusters appears but it is more difficult to find data on cluster collaboration. The results mainly collected through qualitative study should be able to verify or contradict the following eight hypotheses established.

Hypothesis 1: Innovation and research, cluster management excellence and national and European policy are perceived as more important factors towards world- class clusters than cluster collaboration and linkages.

With this hypothesis the perception of cluster collaboration is analyzed in the European Union. Do clusters have a priority for cluster cooperation or do they consider that collaboration is not yet as important as other factors.

Hypothesis 2: Regional and national competitiveness is a necessary precondition for European competitiveness

The purpose of this hypothesis will be to see if economic growth on an EU level is generated by an increased regional or national innovation. If clusters are generating more innovation on a regional level, this will increase the European competitiveness.

Hypothesis 3: Main barriers in the EU for cluster cooperation are related to the different countries such as languages, mentalities and trust and not to financial or economic barriers.

Cluster cooperation is only growing slowly mainly due to certain barriers in the EU which the US don't have. So it is important to know whether the barriers for cluster collaboration are based on the different countries or on other barriers. Economic and financial barriers would be easier to overcome than the split between different nations and a lack of trust. If the barriers are not based on the different countries, companies believe stronger in the EU and its benefits for business opportunities.

Hypothesis 4: The European Union becomes more competitive with its strategy of world-class clusters and is on the right way towards the future

The current policy of the European Union 'towards world-class clusters', is the right way towards the future. With strong interclusters based on excellence, the European Union can increase its competitiveness. This hypothesis will verify or contradict the main question asked in the title.

Hypothesis 5: European cooperation between clusters is a solution for a more balanced and stable Union

This hypothesis will go one step further and put into question if cluster collaboration creates a more stable basis to fight against any further crisis considering hypothesis 4 as true. Or is cluster cooperation only a small factor in the whole equation of the EU which is not strong enough to protect against any further crisis or the decline of the EU?

7.2. Quantitative Data collection

Normally research is based on a triangulation research measuring quantitative and qualitative data. Quantitative data as based on statistics is a good measure of the evolution of a specific sector or region over time, but it is not always applicable.

No paper or source has been found with direct quantifiable EU cluster collaboration data. To give however an approximate idea on the problems with currently available statistical sources, which could one day include cluster collaboration statistics or led to the creation a measurable cluster collaboration indicators, a short summary is presented.

EUROSTAT is the main statistical source for Europe but doesn't consider clusters as statistical unit. The first main barrier is a limited availability of data going deeper than the NUTS codes based on administrative boundaries. Another barrier is that statistical data is based on NACE codes which don't reflect emerging industries. An example is the NACE code for production of electricity which doesn't make a difference producing electricity by wind or solar power or by nuclear power plants. So EUROSTAT as the main statistical institution in the EU doesn't provide any statistical information on clusters and on cluster collaboration.

ECO provides a quantitative analysis of clusters continuously updated in the EU based on a fully comparable and consistent methodology across all countries. However the main data source for the ECO is employment data collected through EUROSTAT. It may not consider clusters with small employment but big capacity. In 2008 the ECO identified around 2000 statistically significant clusters with around 1000 of them have a cluster organisation. As it is difficult to collaborate without any cluster organisation, it is presumed that **around 1000 clusters have the potential in the EU to collaborate**. The data of the ECO is mapping clusters but unfortunately not linkages between clusters.

Other sources which could be helpful to expand the ECO methodology too much focused on employment data are the European Patent Office (EPO) and the OECD data. EPO provides information on patents created in collaboration of firms and by such also clusters and the OECD provides information on the collaboration of firms. Combining several factors with the flow of investments and mapping them according to post codes, it could be seen where cluster activity is collaborating.

The only method however to really identify cluster collaboration would be to ask each cluster in the EU with which other cluster it collaborates and to what extent.

7.3. Qualitative Data collection

The qualitative data provides a better overview of the situation. Even though no quantifiable data is available on cluster collaboration some surveys have been done on this subject.

Hundreds and hundreds of cases studies exist on clusters and cluster policy but it was very difficult to find a single case study on the collaboration between clusters. Often each case tells its own story and results are difficult to compare. Organisations doing these case studies include the ECO, the OECD, different Business Schools such as the Harvard Business School and the Competitiveness Institute (TCI).

One survey was found on cluster collaboration and has been done by the Institute for innovation and technology in Germany. [137] They surveyed German networks on how they perceive internationalisation and their barriers. The few results and conclusions of such studies are shown already in part 6. Cluster collaboration.

By consequence of the lack of quantitative and qualitative available data representing EU cluster collaboration it is essential to create a survey collecting data.

SURVEY PROCEDURE

Survey data is used to collect opinions and data from all partners of clusters and clusters itself. This has a value of itself as their perspectives and their decisions will give a good indication on how they see cluster collaboration, what challenges they have and what they expect from the future. Moreover they can give more exact numbers on their cluster than any statistical source currently existing.

As the survey analyses the situation of clusters and their collaboration in the European Union, it could only be done among organisations related to clusters or individual experts on clusters. An anonymous survey to all people would lose its intrinsic value as the respondents would not be identified and maybe not suitable to answer this questionnaire. By consequence the survey could not be anonymous but all data need to be kept confidential.

So the decision was taken to send the survey only to organisations related to clusters. To find these potential respondents a deeper look was taken into the member lists of several cluster platforms. These lists have been downloaded on the 29.04.2012. Many members were cluster, research organisations, universities, cluster networks, venture capital firms, development agencies and Business incubators, Science Parks, national ministries and chamber of commerce's. *Figure 80* shows the number of members on the ECO, the ECCP and also participating in the ESCA benchmarking clusters study[138].

Figure 80 – member s of platforms and benchmarks

Network	Number of members
ECO	2682
ECCP	1565
ESCA Benchmarked Clusters	177

Source: Composed by author,

Various other contacts made on the European Cluster Conference 2012 in Vienna have been added to the list to enlarge it by crucial experts. As such a final Excel list of all organisations crucial in cluster activity could be generated and contented a total of 3814 organisations excluding duplicates.

In order to contact them and transmit them the link towards the survey, emails needed to be find out. All emails have been retrieved manually on several documents and a huge number of websites. Naturally retrieving emails one by one always bares a high level error and emails could not be found for everybody. In total 3189 emails have been retrieved but some clusters had the same cluster managers and as such duplicates needed to be removed. Finally 3078 emails remained as potential respondents to the survey.

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[137] INSTITUTE FOR INOOVATION AND TECHNOLOGY, *European Clusters go international- Networks and clusters as instruments for the initiation of international business cooperation*

[138] ESCA (2012), *Benchmarking as a tool for cluster analysis*, http://www.cluster-analysis.org/esca-projects

After knowing the potential recipients, a survey could be elaborated. Trying to build just one survey for all of these different organisations however proved to be very difficult. Some questions could be asked to a cluster but not for example to a venture capital firm investing in clusters.

As such three main target groups were identified:

- The first group consists of clusters and cluster organisation. Possible people to answer this survey could be cluster managers
- The second group identified are all the networks or alliances of clusters. In this group collaboration is already taking place and the people answering this survey will represent more than just one cluster.
- The third and last group is regrouping all the members influencing clusters but which are external to the cluster. This could be the research organisations, universities outside of the cluster, venture capital firms, development agencies and business incubators but also ministries, chamber of commerce's and European institutions.

After identification of those three categories three different surveys had to be elaborated and a choice of an online survey tool had to be made. After looking at several, Surveymonkey.com seemed to be the best. Conditions were that three surveys, unlimited questions and also a huge amount of possible responses per month were needed. Surveymonkey proved to have a good plan which provided the possibility of 1000 responses per month. Especially the full download of all the responses to Excel was an advantage which no free survey tool allowed. Moreover the website is quite known and trustful in keeping data confidential.

As such three main surveys with many similar questions have been elaborated. **Survey A** is designed for clusters and cluster organisations, **Survey B** is designed for cluster networks or alliances and **Survey C** will represent all the external partners of clusters. *Figure 81* shows only a short summary of the similar structure among the three surveys. The full questionnaires for the three surveys can be found in *Appendix 11.2* and a closer look at the different questions will be taken in the analysis of its results.

Figure 81- Questions in Survey A,B,C

Page in the survey	Questions	Survey A	Survey B	Survey C
1. Basic information	What is your email?	X	X	X
	What is the name of your organisation	X	X	X
2. Benchmarking	In which country are you present?	X	X	X
	What type of organisation are you?			X
	In which industry are you present?	X	X	
	Your organisation in numbers	X	X	
3. Network	How important are these factors for you?	X	X	X
	Do you have a priority sector?		X	
	Which funding source is important?	X		
	Are you member of the following platforms?	X	X	X
4. Collaboration	Which are your collaborator clusters?	X		
	From whioch countries are they?	X		
	From which industries are they?	X		
	What are the benefits of collaboration?	X	X	X
	What are the barriers of collaboration?	X	X	X
5. One step further	Do you agree with these statements?	X	X	X
	What could be improved in the future?	X	X	X
	In what do you see the challenges for the future?	X	X	X

Source: Composed by author

With the three surveys and potential recipients elaborated, invitation emails could be sent with a link to the questionnaires. The invitation email can be found in *Appendix 11.3*.

To resume out of 3814 cluster network members:

- 625 emails could not be found on the internet
- 111 emails have been removed due to duplicates
- 215 emails were not correct and could not be send

So in total the surveys have been sent to 2863 emails on the 15th of June 2012. Final deadline for the survey was one month afterwards on the 15th of July 2012.

SURVEY RESULTS

After downloading the results, it could be observed that in total 169 organisations answered the survey. However this information is kept confidential and is treated anonymously. Of these 169 participants, 125 were clusters, 13 cluster networks and 31 external partners of clusters.

Figure 82 shows the amount of organisations which didn't answer a question but which participated in the overall survey. It can be observed that the questions where a free writing answer was required were the least popular with the lowest answering quote. It can bee see that an average of 74% of the total participants answered per question in survey A and B, whereas this rate was more elevated (86%) in survey C. The open questions were the least favourite.

Figure 82- Non respondance of questions

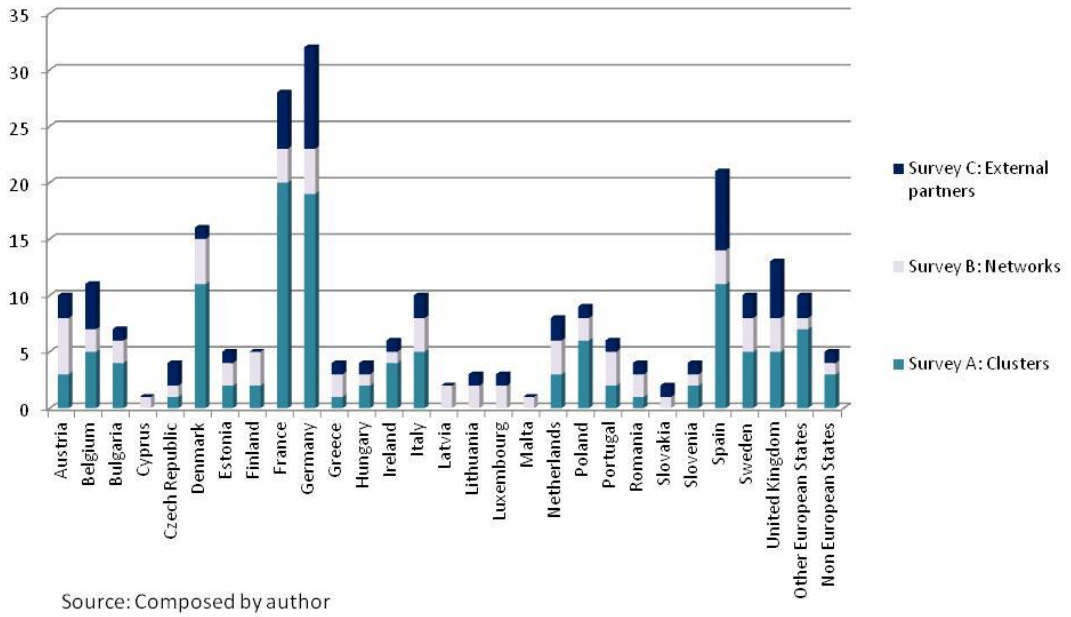
Page survey	Questions	Survey A		Survey B		Survey C	
		125	100%	13	100%	31	100%
Benchmarking	In which country are you present?	13	10,40	2	15,38	0	0,00
	What type of organisation are you?					0	0,00
	In which industry are you present?	13	10,40	2	15,38		
	Your organisation in numbers	15	12,00	3	23,08		
Network	How important are these factors for you?	20	16,00	2	15,38	3	9,68
	Do you have a priority sector?			6	46,15		
	Which funding source is important?	20	16,00				
	Are you member of the following platforms?	38	30,40	6	46,15	11	35,48
Collaboration	Which are your collaborator clusters?	28	22,40				
	From whioch countries are they?	40	32,00				
	From which industries are they?	38	30,40				
	What are the benefits of collaboration?	32	25,60	2	15,38	4	12,90
	What are the barriers of collaboration?	30	24,00	2	15,38	4	12,90
One step further	Do you agree with these statements?	32	25,60	2	15,38	4	12,90
	What could be improved in the future?	67	53,60	6	46,15	17	54,84
	In what do you see the challenges for the future?	73	58,40	6	46,15	19	61,29
	interview	34	27,20	2	15,38	4	12,90
	average answers	73,70667		73,7179		85,8065	

Source: Composed by author

Going through the analysis of each question reveals the differences and common aspects between the different surveys and its implication for this thesis.

Figure 83 shows the representation of the participants' countries in which they have activity. Multiple answers were possible for all respondents. Germany, France and Spain are most represented.

Figure 83– Representation of participants' countries



Source: Composed by author

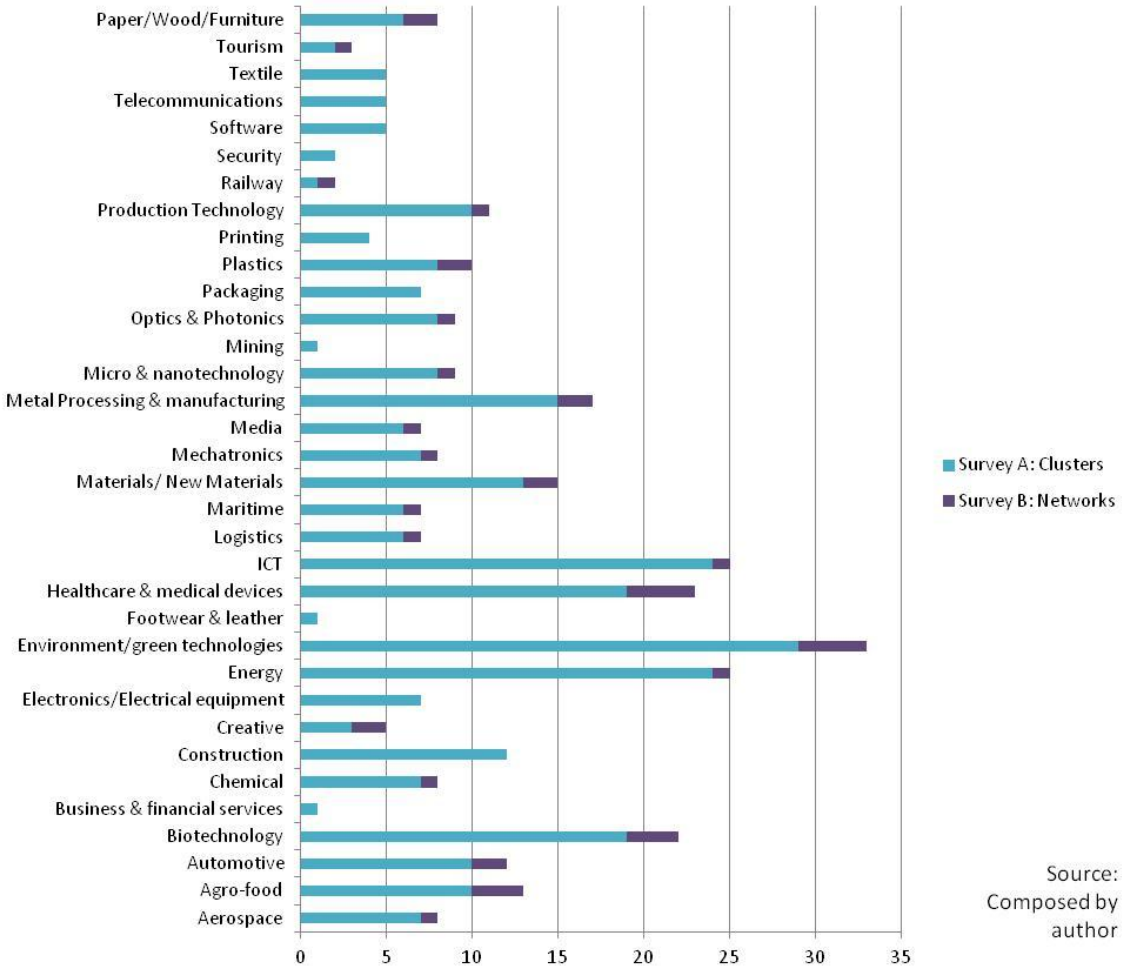
As Survey A and B are showing clusters and cluster networks, the composition of external partners is not so clear. *Figure 84* shows what type of organisation they are. A foundation, some public and national funding agencies and a region have signed up under 'Others'. Not participating were any European institution, university, venture capital firm or business angel.

Figure 84 – Survey C participants

Source: Composed by author

Knowing the type of organisations considered in this survey it is also essential to see if they come from different sectors in order to create an equal distribution. The sectors have been taken from the ECO. *Figure 85* demonstrates that the clusters and cluster networks come from different sectors, multiple answers were possible. The environmental sector is the most represented.

Figure 85 - Sectors of clusters and networks



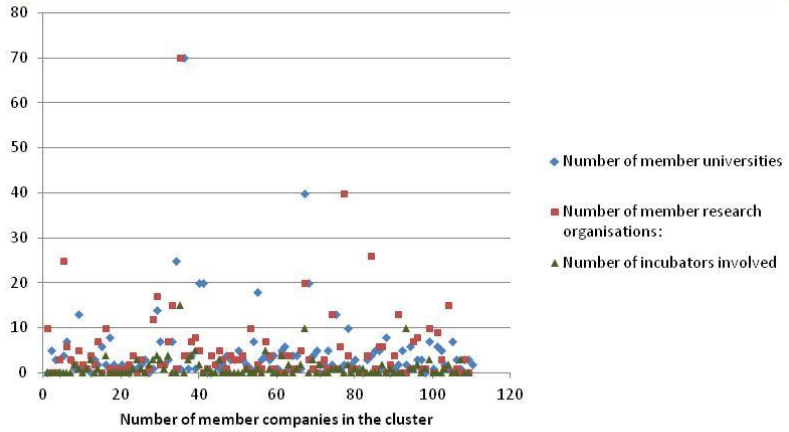
Due to an equal distribution of participants among all countries and all sectors it will be considered for all further analysis that this sample is representative for the cluster related population. Conclusions from this survey can as such demonstrate a clear trend in cluster activity.

To benchmark the different clusters in the European Union, the cluster organisations and cluster networks have been asked some numbers. All cases in the survey with no information were considered as zero for this statistics.

- **Clusters:** In average 97 companies are involved in a cluster with an average of 5 member universities, 4.9 research organisations and 1.2 incubators. They employ in average 9518.5 employees even though this number is not very accurate as some clusters indicated the total number of employees working in the cluster and others the number of employees working directly for the cluster without considering the number of employees in the different member companies. The average total turnover of a cluster varies a lot between smaller and bigger clusters, giving an average of 1.6 billion Euros.
- **Networks:** In average 10 clusters are involved with a total of 924.3 member companies. As such a network regroups in average 22 member universities, 206 research organisations and 7.4 incubators. As only 2 networks gave information for the total employees in the cluster and their turnover, this information is not representative enough to calculate statistics.

Figure 86 shows the number of member organisations in a cluster. It can be demonstrated that there is no correlation between the number of firms in a cluster and the corresponding amount of member universities, research organisations or incubators involved. The cluster with the highest number of research organisations and universities has only a small to medium number of companies involved which explains a still weak relation between the research and the business world. Another explanation could be that clusters with more companies are more production and services oriented and less towards R&D.

Figure 86 – Number of members in clusters



Source: Composed by author

The benchmarking information for clusters and networks shows a good representation of the population and statistics can as such be used for further analysis.

The next step in the survey considered the networking capabilities of clusters and networks based on their personal opinions. *Figure 87* (%) shows the opinions on cluster management excellence, innovation and research, cluster collaboration and linkages, European policy and initiatives and an important website. For clusters the most crucial is innovation and research. Networks and external partners also consider the importance of cluster management excellence. By consequence cluster collaboration and linkages is only perceived as a secondary priority for clusters, external partners and even networks which are based on this collaboration.

Figure 87- Cluster factors importance

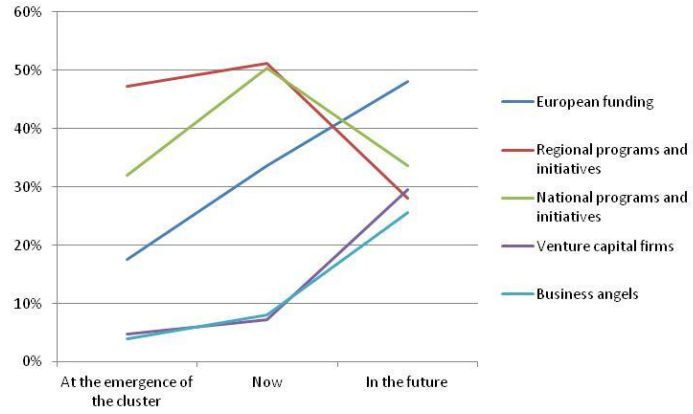
	Cluster management excellence	Innovation and research	Cluster collaboration and linkages	European policy and initiatives	An important website
Clusters					
Crucial	40,38	52,83	33,01	9,71	10,48
Very important	49,04	34,91	56,31	39,81	43,81
Moderately important	9,62	11,32	9,71	41,75	34,29
Not important	0,96	0,94	0,00	8,74	9,52
Not sure	0,00	0,00	0,97	0,00	1,90
Networks					
Crucial	44,44	55,56	44,44	12,50	12,50
Very important	33,33	22,22	55,56	50,00	50,00
Moderately important	11,11	22,22	0,00	25,00	25,00
Not important	11,11	0,00	0,00	12,50	12,50
Not sure	0,00	0,00	0,00	0,00	0,00
External partners					
Crucial	62,96	44,44	34,48	3,70	7,14
Very important	25,93	44,44	62,07	51,85	25,00
Moderately important	11,11	11,11	3,45	40,74	50,00
Not important	0,00	0,00	0,00	3,70	7,14
Not sure	0,00	0,00	0,00	0,00	10,71

Source: Composed by author

Networks were asked if they have a priority sector or cluster to which they give more attention than to others. Some said no, but others confirm the hypothesis that specialisation is taking place by answering that they have a specific priority sector. Popular were mainly Mobility, Green, Food, Maritime, Health and Life Sciences technologies. Even if networks focussed on a specific sector, all clusters within were considered equally.

Clusters were asked how important they consider different sources of funding in the past, now and for the future. *Figure 88* demonstrates that the most important funding source at the emergence of a cluster is coming from regional programs and initiatives. With the development of the cluster the preference for national programs is shifting more towards European funding from which 48% of clusters see their future funding coming from. Clusters are willing to become more involved in Europe and don't want to stay regional. As they become more European venture capital and business angels become also more important as a funding source. Clusters also specified as an important funding source membership fees, meeting fees, economic development agencies, commercial sales of services and corporate sponsors.

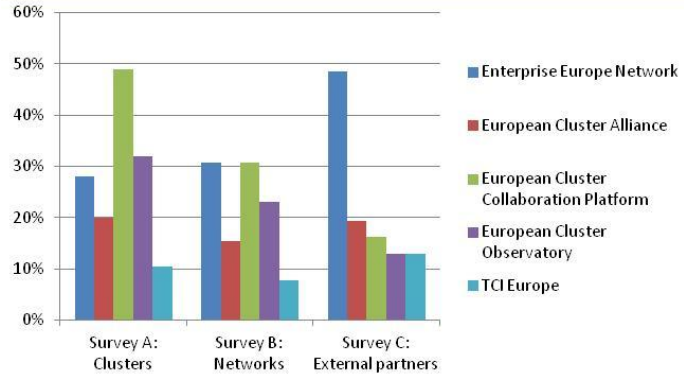
Figure 88- Funding source of clusters



Source: Composed by author

So clusters are willing to become more European, but are they also already present on cluster or innovation platforms to collaborate with other clusters? *Figure 89* shows that clusters are mostly present on the ECCP, networks are present on the ECCP and EEN and external partners are mainly present on the EEN which is more based on companies rather than clusters. This is logical as clusters use mainly the cluster platforms and external partners focus more on companies than clusters.

Figure 89 – Cluster networks



Source: Composed by author

As multiple answers were possible for this question and there are still many clusters, networks and external partners not yet registered on these platforms (over 50% missing) it is essential to push further the registration on platforms crucial for European collaboration.

In the next part, clusters have been asked to name the clusters with which they collaborate. As all information is kept anonymous this is mainly important to create examples for the thesis. The reasons why some don't collaborate were that they couldn't identify other suitable clusters to collaborate or they are still too small in size. Clusters first need to have a perfect internal collaboration before starting to collaborate externally.

Figure 90 shows which country is mainly cooperating with which other country. The numbers in the matrix represent the number of connections between the cluster and other clusters. It is clear that the collaboration among a country itself is the most popular considering lower barriers. Denmark, France, Germany and Sweden are countries which collaborate with many other countries in the EU as there are only few countries to which they don't have any connection.

Figure 90 – Cluster cooperation: country to country

Cluster	Collaborative cluster: Austria	Belgium	Bulgaria	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	United Kingdom	Other European States	Non European States	not known
Austria						1																								2
Belgium	1	4				1			3	2									3										1	
Bulgaria			1			1																								2
Cyprus																														
Czech Republic									1	1				1											1		1			
Denmark	5	2	1		1	5	2	3	3	5	1	1	2	2	2	2	1	2	3	3	2	1		1	3	4	2	1	5	2
Estonia						1	2												1	1					1					
Finland	1	2		1			1	1	1	2	1			2					1		1				1	2	1		1	
France	3	6	1		1	1		1	10	8	1	1	3	7			1		5	2	2	1			8	2	4		6	5
Germany	6	6			1	2		2	7	12	1	3	1	3		1	2		4	4	2		1		5	3	4	2	8	4
Greece																													1	
Hungary	1											1								1		1								
Ireland	1					1		2	2	1			2	1					1							1	2	1	1	2
Italy		1				1		1	2	1				2					1					1	2	1	1	2	2	1
Latvia																														
Lithuania																														
Luxembourg																														
Malta																														
Netherlands		1							1	1									1						1				1	1
Poland			2							1				1						4								1		1
Portugal	1								1	1				1							1				1	1		1		1
Romania																														1
Slovakia																														
Slovenia					1				1	1			1					1						1			1	1		1
Spain				1		1			2	1				1						1	1	1			8			1		2
Sweden	1	2	1		2	2	1	1	2	2	1	2	1	2	1	1		1	2	2	1	1		1	1	5	1	1	2	
United Kingdom	1								3	3	2			1					1		1				1	1	1		1	2
Other European Sta	1	1	1		1	1		1		1		1									1			1	1	1	1	1	1	4
Non European States									1																					

Source: Composed by author

Knowing the countries collaborating mostly together, which are the sectors most interconnected in the European Union? *Figure 91* demonstrates with the diagonal descending line that most clusters interconnect as a priority with clusters of their own sectors. Some more transversal sectors such as ICT, Mechatronics, Materials, Energy, Environmental and Green technologies, Logistics or Production Technology are however connected to most other sectors (to at least 25 of the 35 sectors).

Figure 91 – Cluster collaboration: Sector to sector

Participant cluster	Aerospace	Agro-food	Automotive	Biotechnology	Business & financial services	Chemical	Construction	Creative	Electronics/Electrical equipment	Energy	Environment/green technologies	Footwear & leather	Healthcare & medical devices	ICT	Logistics	Maritime	Materials/ New Materials	Mechatronics	Media	Metal Processing & manufacturir	Micro & nanotechnology	Mining	Optics & Photonics	Packaging	Plastics	Printing	Production Technology	Railway	Security	Software	Telecommunications	Textile	Tourism	Paper/Wood/Furniture	Other (please specify)	Not known
Aerospace	6		2						1	2					1	1	3	2		2	1		1		1			1	1							2
Agro-food		7		5	1			1		1	2		5	2							1			2								1		Spc	3
Automotive	1		4		1	1			1	1	1		1	1			1	1												1					5
Biotechnology		4		11	1	5	1		1	5	3		9	3			4	3			8		1	2	4	1	1			1				1		3
Business & financial services					1									1																					
Chemical				2		5	1	1	1	5	2		1	1			4				3			2	3	2	1					1		2		2
Construction	1		1	1		1	7		1	3	4		2	1			5				1			1	1	1						1		4		4
Creative						1		2		1	1			1			1		1					1		1	1			1		1		1		1
Electronics/Electrica	1													1																					6
Energy	1	1	2	1		4	2	1		13	6			5	1	2	4	2		2	4		2	1	3	1	1	1		1		1		1		6
Environment/green	3		5	1	5	7	1	1	12	14		4	5	1	2	9	2		1	7	1	3	3	3	2	3			2		2		5		7
Footwear & leather													1																						
Healthcare & medica	3		9		2	1		1	1	2			13	4			1	2			5		3	1	3	1	1			2	1	1		1		3
ICT	1	2	5	5	5	1	1	3	2	5	5		6	16	3	1	1	3	3	1	4		1	2	3	1	3	1	1	5	5		1	3		5
Logistics	1		2	1	1	1		1		1	2			2	2	2	2	1		1	1	1		2		1	1	1	1	1	1	1		1		2
Maritime	1		2	1						1	1			1	2	2	2	2	1	2	2	1			1		1	1					1		1
Materials/ New	1		2	2		4	3	2	1	5	5		1	2	2	2	10	3		3	6	1	2	2	3	2	2	1		1		3	1	6		3
Mechatronics	1	1	2							1	1			1	2	2	2	4		2	3	1	1		1		1	1		1						2
Media			1	1	1			1			1		1	3	1	1			1						1		1			1			1		2
Metal Processin	2	2	3	1		2	1	1	1	3	5		1	2	2	2	5	3		5	7	2	1	1	4	1	3	1		1		1	1	3		4
Micro & nanotechnology			1	2		1	1		1	1	2		2	3	1	1	3	2		1	6	1	1	1	1	1	1			1				1		1
Mining			1								1			1	1	1	1	1		1	1	1					1									1
Optics & Photon	1		1	2		1	1		2	2	3		2	2			3	2			4		4	1	2	1	2		1	2	1			2		3
Packaging		3		2	1	2	1	1	1	3	3		2	3			2				2			3	1	2						1		2		1
Plastics				2		4	1		1	3	1		1	1			3			2	3			1	5	1	1							1		3
Printing		1		1		1	1		1	1	1		1	2			1				1			1	1	1								1		1
Production Tech	1	1	2	1		2	1	1	1	2	4		1	3	1	1	4	1		1	3	1	1	2	1	2	2					1		2		1
Railway	1		1							1					1	1	1	1		1	1				1			1								
Security																		1			1		1						1	2						
Software														1				1			1		1						1	2						1
Telecommunications			1	1	1			1			1		1	2	1	1			1						1		1				2			1		3
Textile				1		1	1						1	1			1															2		1		1
Tourism													1																							1
Paper/Wood/Furniture				1		2	3	1	1	2	2		1	2			4				1			2	1	2						2		4		2
Other (please sp	Engineering & Tooling, Mobility, Sport, Leisure, Education,, Smart Grid, Houshold, Cosmetics, service innovation																																		

Collaborative cluster

Source: Composed by author

So collaboration is happening in the EU, across countries and also across sectors even though the own countries and the own sectors are always the most popular. What do clusters, networks and also external partners however consider as the most beneficial factor in collaboration? *Figure 92* shows that this opinion varies across actors. Clusters consider the benefit of exchanging experiences and knowledge as crucial and an integrated supply chain as the least important. Networks and external partners consider networking crucial and the gain of reputation and cost reduction the least important.

Knowing the benefits of collaboration what are the barriers to cluster collaboration? *Figure 93* shows the main barriers considered by participants of the three surveys. Different cultural backgrounds and languages are a certain barrier but not as big as the low interest in collaboration. A huge barrier perceived by networks is the lack of knowledge about other clusters. All other factors are perceived as a certain barrier but the concerns about losing their independence are very low for clusters.

Figure 92- Benefits of collaboration

	Better access to finance	Access to new markets	Exchange of experiences and knowledge	Gain of reputations	Cost reduction	Joined R&D	Networking	Integrated supply chain
Survey A								
crucial	9%	22%	33%	9%	2%	16%	31%	2%
very important	22%	35%	33%	40%	15%	30%	33%	19%
moderately important	20%	11%	7%	19%	23%	18%	8%	22%
not important	15%	3%	2%	4%	22%	3%	1%	23%
not sure	5%	1%	0%	0%	6%	3%	0%	5%
Survey B								
crucial	15%	38%	54%	23%	8%	23%	62%	0%
very important	15%	15%	23%	15%	8%	31%	15%	31%
moderately important	23%	15%	0%	38%	38%	8%	0%	23%
not important	15%	0%	0%	0%	15%	0%	0%	0%
not sure	0%	0%	0%	0%	0%	8%	0%	8%
Survey C								
crucial	10%	23%	35%	3%	16%	29%	45%	13%
very important	52%	55%	48%	39%	19%	42%	35%	32%
moderately important	23%	6%	3%	42%	26%	16%	6%	23%
not important	3%	3%	0%	3%	19%	0%	0%	13%
not sure	0%	0%	0%	0%	3%	0%	0%	3%

Source: Composed by author

Figure 93 – Barriers to collaboration

	Different cultural backgrounds	Different languages	Low interest in collaboration	Economic imbalances between EU member countries	Collaboration is too expensive (Travel,...)	Not enough support programs for collaboration	Administrative and regulatory barriers	Lack of knowledge about other clusters	Concerns about losing independence	Risk to invest ressources into wrong direction
Survey A										
No barrier	26%	32%	13%	21%	13%	13%	19%	19%	50%	25%
Certain barrier	42%	35%	38%	34%	38%	29%	26%	38%	0%	38%
Huge barrier	5%	6%	20%	8%	20%	27%	18%	14%	0%	7%
Not sure	2%	2%	3%	10%	4%	6%	10%	3%	3%	5%
Survey B										
No barrier	15%	31%	15%	31%	15%	0%	15%	8%	23%	15%
Certain barrier	54%	31%	23%	15%	46%	46%	31%	15%	31%	62%
Huge barrier	0%	8%	31%	23%	15%	15%	23%	46%	15%	0%
Not sure	0%	0%	0%	8%	0%	8%	0%	0%	8%	0%
Survey C										
No barrier	6%	16%	13%	39%	13%	19%	19%	6%	16%	19%
Certain barrier	71%	48%	29%	39%	42%	42%	35%	58%	48%	45%
Huge barrier	3%	19%	42%	6%	23%	23%	19%	23%	19%	19%
Not sure	6%	3%	0%	3%	10%	3%	13%	0%	3%	3%

Source: Composed by author

The last step goes a bit further and asked personal opinions on several subjects. *Figure 94* demonstrates that all participants strongly agree that clusters promote European businesses over regional boundaries and that regional competitiveness is a necessary precondition for EU competitiveness. So if the EU wants to become more competitive, clusters are a good basis as they create regional competitiveness. By consequence everybody agrees that cluster cooperation is essential to create a more competitive European Union. Where the opinions are not so clear is whether the EU strategy towards world-class clusters is the right way towards the future. Some strongly agree, some neither agree nor disagree and some are not sure. External partners tend to believe more than other actors that collaboration among clusters can stabilize the EU against a future crisis and that interclusters can then be the ultimate form for collaboration in Europe.

Figure 94 – Perosnal opinion on some issues

	Clusters promote European businesses over regional boundaries	Regional competitiveness is a necessary precondition for EU competitiveness	Cluster cooperation is essential for a more competitive European Union	The EU strategy towards world-class clusters is the right way towards the future	Collaboration among clusters can stabilize the EU against a future crisis	Hubs of clusters or interclusters could be the ultimate form for collaboration in Europe
Survey A						
strongly agree	46%	60%	50%	27%	23%	24%
neither agree or disagree	22%	12%	17%	26%	32%	35%
strongly disagree	2%	0%	3%	6%	7%	5%
not sure	3%	2%	4%	16%	12%	10%
Survey B						
strongly agree	46%	62%	62%	31%	15%	31%
neither agree or disagree	23%	8%	15%	31%	38%	38%
strongly disagree	8%	8%	0%	0%	15%	0%
not sure	0%	0%	0%	15%	8%	8%
Survey C						
strongly agree	48%	71%	58%	42%	35%	35%
neither agree or disagree	32%	13%	29%	23%	32%	32%
strongly disagree	6%	3%	0%	0%	10%	6%
not sure	0%	0%	0%	23%	10%	13%

Source: Composed by author

So participants see the value of clusters for the future competitiveness of the EU and that collaboration is essential. However they are not sure about the current EU politics and the fact if cluster collaboration is really important enough to stabilize the EU.

Participants have been asked what they think that needs to be improved in the future in order that their cluster can be more competitive. Recommendations made by clusters included cluster collaboration support programmes on longer terms, better financing possibilities, better market connection, closer cooperation to R&D, raise the awareness of partner clusters, access to the same information by crowd-sourcing and better accounting, reporting and auditing procedure for EU financing. Especially the last ones are known to be too rigid, too slow and limit innovation opportunities. Networks also recommended better funding rules all over the EU and better knowledge of value and supply chains. External partners would find it useful to have more case studies of successful cluster cooperation in order to demonstrate concrete possible benefits. A harmonisation between the different cluster initiatives is needed. Cluster funding is too difficult to get and support programmes for interclusters are needed.

One challenge of the future EU is unpredictable financial support for clusters, which makes it difficult for them to plan. Some see also the current Euro instability and the overall cohesion as a big challenge for the future. The 'EU must promote quality and knowledge to preserve from low cost currency.' Moreover it is a challenge to secure innovation growth, reduce bureaucracy and create knowledge about cooperation and other clusters. More specifically some name also the need for greener and more sustainable energy in cities and regions. Other opinions also see a problem in the demography as our society is getting older. In general the whole challenge lies in the integration of the EU countries, the collaboration of clusters on a more international level and in opening up the EU towards the rest of the world.

7.4. Verification of hypotheses

Innovation and research are perceived as the most important factor, followed by cluster management excellence and cluster collaboration. European policy and a website are not so important. As such hypothesis 1 is only partly contradicted. Directly behind innovation and research, cluster collaboration is perceived as important enough to move towards world-class clusters.

Regional and national competitiveness is a necessary precondition for European competitiveness which verifies hypothesis 2. So clusters as a factor for regional competitiveness can improve European competitiveness and are even essential for the future.

Cultural and linguistic differences are perceived as a certain barrier whereas other factors are seen as huge barriers, so hypothesis 3 has been contradicted. Cluster collaboration is not hindered much by the fact that the EU is composed by different countries but more by other factors such as a low interest in collaboration, access to finance and knowledge about other clusters. These barriers are easier to overcome as they are mainly based on a lack of information.

Most actors agree that the EU is on the right way towards the future by implementing the Europe 2020 strategy even though a high percentage of actors were not sure. This verifies hypothesis 4. As it is based on a policy towards world-class clusters which implicates cluster collaboration, it can be concluded that cluster collaboration is perceived as the right way towards the future.

Hypothesis 5 can neither be contradicted nor verified. European cooperation between clusters might or might not be a solution for a more balanced and stable Union. As it is perceived mainly as the right way towards the future, it is however unclear if in the future its impact will be big enough. Opinions are very different on this topic and only the future will show if the current strategy was the right way.

In conclusion it can be seen that among the participants of this survey which can be considered representative for the whole cluster population; cluster collaboration is happening and made significant progress in the last years (also already concluded by EIT study[139]). The priority is given to clusters in the same country and the same sector but some are cooperating already over these boundaries. Even though collaboration is for clusters only a second priority after cluster management excellence and innovation, it is perceived as the way to become a more competitive EU. Reason number one for collaboration is the exchange of experiences and knowledge but participants are not yet registered on networking platforms. European funding becomes increasingly important but is still considered to be difficult and too slow to achieve. There are still many barriers in place and a huge number of challenges to overcome for the EU but cluster collaboration is improving EU competitiveness.

[139] INSTITUTE FOR INOOVATION AND TECHNOLOGY, *European Clusters go international- Networks and clusters as instruments for the initiation of international business cooperation*

8. IMPLICATIONS & LIMITATIONS

Theoretical and managerial implications and also limitations of this paper need to be considered in order to know the value of the results.

8.1. Theoretical implications and limitations

The theoretical implication is that the cluster concept stretched for the first time in history to a Union of 27 countries is working. Cluster collaboration is happening in the EU even though it is only slowly becoming more popular. As the cluster concept and cluster policies are pushed extensively at the EU level new theoretical observations and theories can emerge.

The limitations are that theories concerning clusters are not older than 30 years and that by consequence there is still a large knowledge gap in the existing business literature around clusters. It is not yet clear what world-class clusters or interclusters are and how they can be measured. Even though the EU is pushing the concept of world-class clusters, there almost no literature on cluster collaboration. There are no measurers of cluster collaboration as a degree of linkages to other clusters or a rate of collaboration in the EU. There are no clear theories of what suitable partners are or what needs to be fulfilled for a successful collaboration. There are even no case studies of successful world-class clusters in the EU even though every cluster should strive for it.

8.2. Managerial implications and limitations

Managerial implications of this thesis are that cluster collaboration is slowly becoming more common in the EU and that renders the EU more competitive.

There are however more managerial limitations of this study. Cluster policies, programmes and initiatives are not coordinated and it is difficult to keep an overview. They lack often a direct connection to the clusters in the area. Moreover going through cooperation to another country takes a great deal of time and effort, as it consists of learning about a new culture, legal system and language. A cluster which choose to go China rather than any of the European countries was the Swedish cluster Future Position X, Europe's leading geographical information cluster. The reason behind was that if they have to go through this effort and time with a new country, why not directly go to a bigger market. China is showing nine to ten percent growth and they gained a population bigger than in any European country.[140]

So clusters also need to be willing to collaborate with other European clusters. Clusters only slowly recognize the benefits of collaborating with other clusters and the ultimate form of collaboration, the emergence of regional interclusters is very rare and not yet existent on a European level. It will take time to fulfil such integration in the EU and it will only be seen in a certain years if clusters are really moving towards world-class clusters. For the moment the EU is still too fragmented and lacks trust among clusters.

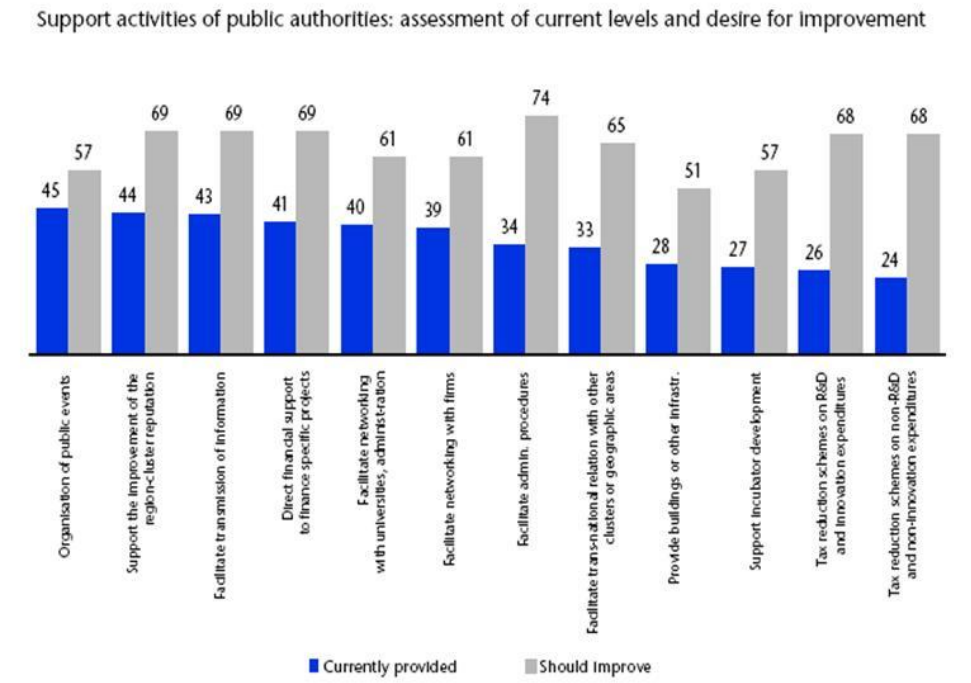
[140] EUROPA INTERCLUSTER (2010), *White Paper- The Emerging of European world-class clusters*, http://www.intercluster.eu/index.php?option=com_flexicontent&view=items&cid=1:frontpage&id=159:release-of-the-white-paper-on-the-emerging-of-world-class-clusters&Itemid=1

9. RECOMMENDATIONS

The main recommendation which could help clusters to collaborate further and pull down barriers across the EU would be to build an **EU Cluster Centre**.

The Innobaromoeter 2006[141] survey already found out that the most important areas in which cluster firms would like more support from the public domain are in facilitating administrative procedures, facilitating information flow, getting more finance for specific projects, improving the branding of their region, tax reduction for expenditures and 65% want further support to increase their cooperation with other clusters. (*Figure 95*)

Figure 95 – Support activities of public authorities



Source: EUROPE INNOVA & PRO INNO (2007), *Innovation clusters in Europe: A statistical analysis and overview of current policy support*, paper n.5, Office for Official Publications of the European Communities, ISBN: 978-9279072895

The EU cluster centre would in fact enable the facilitation and support of all these factors and more. One of the main problems of cluster collaboration is that nothing is centralised. Information is everywhere and several programmes and initiatives for which it is difficult to keep an overview exist.

This centre would function as a user-driven information hub for all clusters of different sectors and help them evaluate and collaborate. It should mainly be operated by the EC as 'EU level intervention is justified by the need to develop globally competitive and interconnected clusters' (EC, 2006)[142], but should also include external experts. It needs however to be a **neutral** institution which wouldn't advantage any country or cluster over others.

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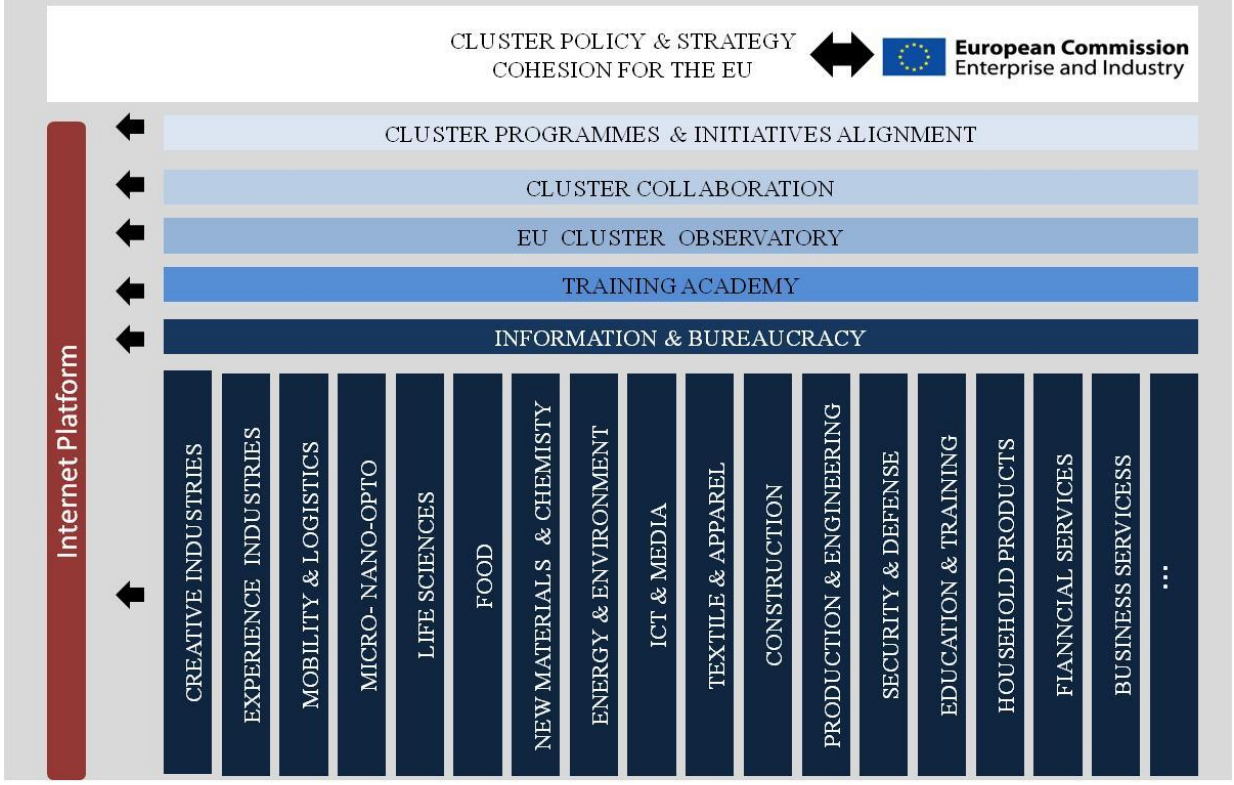
[141] EUROPEAN COMMISSION (2006), *2006 Innobarometer on cluster's role in facilitating innovation in Europe- Analytical Report*, Flash EB Series #187

[142] BUSINESS EUROPE (10.2009), *Unite and innovate! European clusters for recovery*, http://www.tmforsk.no/mediafiler/fil.asp?id=955 (07.07.2012)

The structure of the EU Cluster centre would have different departments based on different sectors and some transversal departments. An initiative already applying in some form this sector-based approach is Europe INNOVA. The simplified **structure of the cluster centre** could be as shown by *figure 96.*

Figure 96- EU Cluster Centre structure



Source: Composed by author

The departments would be separated into some vertical so sectoral and horizontal, so cross-sectoral departments.

Each **vertical section** is **representing a sector** which is increasingly important as our world is moving towards smart specialisation and some barriers are sector specific. For each sector one or two experts from the field could be responsible supervising the activity and trying to reduce barriers. Information would be crowd-sourced from clusters and cluster organisations within the sector. Naturally these experts would work together in cases of cross-sector questions and sectors present in their value or supply chain.. Another aspect of having departments for each major sector is to give the sector a major brand and collaboration possibility. The maritime sector would for example represent at the same time the European maritime network of clusters and as such include all clusters from this sector. This would not only allow strengthen lobbying processes but international maritime clusters could also contact more easily EU maritime clusters. International collaboration within the same sector could be enhanced.

Horizontal departments would work together with the sectoral departments, collect information from these and support them.

One cross-sectorial department would function as **information help desk and reducing bureaucracy** department. Clusters need a place where they can ask for more information on cluster management excellence, certificates, EU trade, Patents, etc. This helpline can connect them to sectoral experts or give necessary information on the culture and business world of different EU countries. A neutral

facilitator could enhance that trust builds faster. Other information could be a financing and funding interface bringing together venture capital firms, business angels but also banks and public actors. This centre would reduce major barriers such as the lack of knowledge about other clusters and other cultures as also the access to finance in the EU and would also help clusters in administrative procedures and reducing bureaucracy. As such it would also help to creating standards for clusters. In an increasing dynamic world it is important to see all major barriers and help to overcome them so that businesses can react faster and innovate.

Another department would be the **training academy** for cluster managers or innovation agencies. This training agency would also help to further develop cluster management excellence and provide useful courses on all cluster related subjects. This department would also be responsible for the several awards distributed such as the European Cluster management excellence label or the European Cluster manager of the year award.

The **EU cluster observatory** (ECO) should be integrated to the EU cluster centre. Clusters contacting the centre for information, profiting from EU funding, registering on the platform or having training in the centre would give information about their cluster or network to this department. ECO as provider of neutral statistics on clusters can be responsible for mapping and benchmarking studies. Measuring better the impact of cluster policies and programmes is also important and regular and centralised data collection is needed. As clusters would be statistical units, it would be better than EUROSTAT. Another important aspect would be to define clusters by their square meters and not by NUTS codes. This would allow measuring the boundaries of clusters more accurately. The mapping tool would also need links to all clusters actors in order to fast follow information. A mapping of collaboration links would be nice in order to see the emergence of world-class clusters. ECO ccould produce more relevant statistics on more data than just employment to see how clusters work and collaborate. As such cluster linkages could be mapped and a more accurate view on cluster collaboration could be produced. These cluster linkages should be defined by the stage (1-3) in which they are which would facilitate to retrieve strong linkages across Europe.

The **cluster collaboration** department is based on the same principle as the cluster collaboration platform. Fuelled by information of the EU cluster observatory, it provides information and a platform for clusters seeking internationalisation. Moreover this department would provide a section for several collaboration associations such as the European Club of cluster managers. The platform would also be separated in cluster collaboration within the EU and with clusters outside of the EU. World-class clusters can only emerge with strong collaboration linkages and they need a platform on which they can start this collaboration. It can also provide useful information on markets outside of the EU and cluster with potential of collaboration. 'The openness of European businesses to cooperation with first-class knowledge hubs- both within and without Europe – is a prerequisite for the emergence and growth of world-class clusters.'(EC, 2008)[143] Only this cross fertilization would enhance competitiveness enough to reach critical mass. It could further link also universities, research centres and other actors to clusters and to industry. It could be that with this information even new clusters would emerge naturally in the EU as new triple helix relations are build. This department would also be responsible to provide information on networking and collaboration opportunities in the EU but also from the rest of the world such as international cluster conferences and meetings.

[143] COMMISSION OF THE EUROPEAN COMMUNITIES (2008), *Towards world-class clusters in the European Union*, SEC 2637, Brussels, ISBN: 978-9279098055

A further cross-sectoral department is the **cluster programmes and initiatives alignment** department which would stay in contact with all major ministries, national agencies and public authorities responsible for clusters and innovation in the EU. The department would help to collect information about national and regional programmes and initiatives to give a good overview to clusters and help to coordinate them. Next to aligning all those programmes and initiatives it is however also essential to still promote regional development and contests. Fiscal and non-fiscal incentives to regional and public authorities could help developing new pilot initiatives. This department would help aligning EU programmes and initiatives to the national and regional ones and create as such a broad complementary framework for clusters. Already the White paper (2010) recommends combining 'all programmes existing at the commission level with the aim to provide a one-stop shop for all international efforts of cluster'. [144] This department could evaluate them regularly and be able to enlarge the time period if needed, assuring longer project terms. They should also focus on involving industry directly so that the initiatives will not end but continue under private supervising. The ECPG (2010) recommended in its final recommendations that 'thematic EU programmes in specific economic or technology fields should be systematically connected with the relevant European clusters in this field.'[145] So it is important that this cross-sectoral department is closely linked to all the sectoral departments and by such industry and clusters directly.

All these departments, sectoral and cross-sectoral would put information on their **internet platform** and help as such clusters find in one centralised place all information. As such all information on trainings, programmes and initiatives, statistics, mapping, certificates and sector-based expertise could be found in one place. Cluster would not need to register on many platforms but just to one single one. The cluster collaboration platform, the cluster alliance platform, the cluster excellence platform and many others could be united in one major cluster platform for the EU. Many clusters don't know all of the exiting platforms and don't want to register individually on each, so one single platform with one single registration would be much easier. As all the previously named platforms are funded by the European Union this would also reduce costs for the EU. There is no need to create a total new platform but to integrate all exiting platforms such as the ECO and ECCP into one with links to all regional and national platforms such as the national cluster platform Austria and to sector based networks such as ENCADRE. To illustrate this understanding, *figure 97* could show a possible structure of the website.

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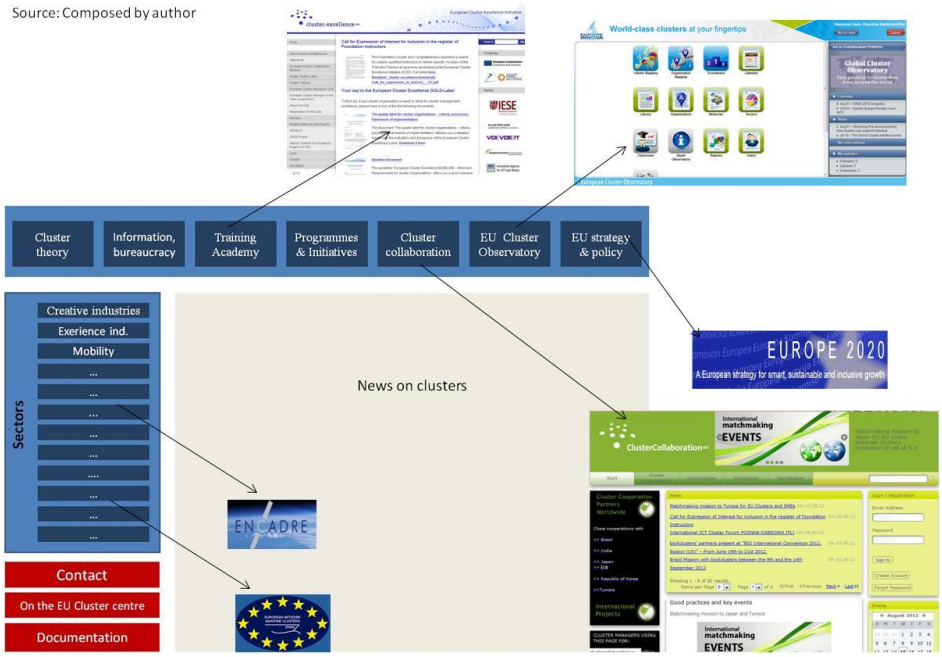
[144] EUROPA INTERCLUSTER (2010), *White Paper- The Emerging of European world-class clusters*, http://www.intercluster.eu/index.php?option=com_flexicontent&view=items&cid=1:frontpage&id=159:release-of-the-white-paper-on-the-emerging-of-world-class-clusters&Itemid=1

[145] EUROPEAN CLUSTER POLICY GROUP (2010), *Final recommendations- A call for Policy Action*, http://www.proinno-europe.eu/ecpg/newsroom/ecpg-final-recommendations p. 13

Figure 97- EU Cluster Centre Platform



To go one step further this cluster centre would also have a group of experts working in a **cluster policy and strategy cohesion department** for clusters. This could be the board of the EU Cluster centre which would be in permanent contact with the EC. If they have all the information from the departments they would be able to create better policies for clusters. This department could also provide further incentives for countries to implement those policies on a regional and national level.

Concluding the EU Cluster centre would exist under the EC and centralise all measures and information on clusters. It will build on existing networks and centralise them into one big platform. Clusters and public authorities would find information faster, the Commission would be better informed, statistics would be more accurate, barriers would be faster overcome and clusters would be moving faster towards world-class clusters enhancing competitiveness in the EU.

However it has to be said that this centre can never substitute the role of the industry but will only create the best possible framework conditions for clusters and cluster collaborations. It will inform and reduce bureaucracy, provide platforms and trainings, enable the best programmes and initiatives, but it is the job of the clusters to take action and involve.

The Committee of the Regions already recommended 'that the EC remedy the fragmented nature of the measures devoted to cluster promotion in the EU, and considered that these should be grouped under one specific line of action to promote clusters and support inter-clusters cooperation.'[146]

[146] EUROPE INNOVA & PRO INNO (2008), *The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned Union*, paper n.9, Office for Official Publications of the European Communities, ISBN: 978-9279098383

10.CONCLUSION

Next to clusters there will be other challenges in the future such as climate change and energy trouble, the ageing of the population or other financial and economic crisis. Europe needs more harmonised certifications on education and further improvements in the free flow of human resources. It is also still a question if Greece and several other countries will overcome the current challenges and become competitive again.

Considering all those challenges it is questionable if cluster collaboration which is only slowly becoming more common, will be strong enough in the coming years to overcome all those challenges. It can however be said that cluster collaboration is certainly a good and right way towards the future. European companies are the heart of business activity and if they are more competitive, this will lead to more competitive countries, which lead to a more competitive Union, which by consequence will be a source of prosperity.

'In today's globalised economy national clusters, regardless of how successful they may be, do not suffice to ensure, let alone strengthen, Europe's competitiveness. In my view, if Europe manages to link its existing clusters- and we have top performers in many fields – we would finally get what we all, policy-makers and European businesses, have been striving for: A strong competitive edge.'[147] (Danuta Hübner, European Parliament, 2009)

Thesis count of words: 20 109

[147] BUSINESS EUROPE (10.2009), *Unite and innovate! European clusters for recovery*, http://www.tmforsk.no/mediafiler/fil.asp?id=955 (07.07.2012)

11.APPENDICES

11.1. Figures

Figure A– Four types of economic agglomerations

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

Source: KETELS C. & LINDQVIST G. & SÖLVELL Ö. (June 2008), *Clusters and Cluster Initiatives*, Center for Strategy and Competitiveness- Stockholm School of Economics, p.5

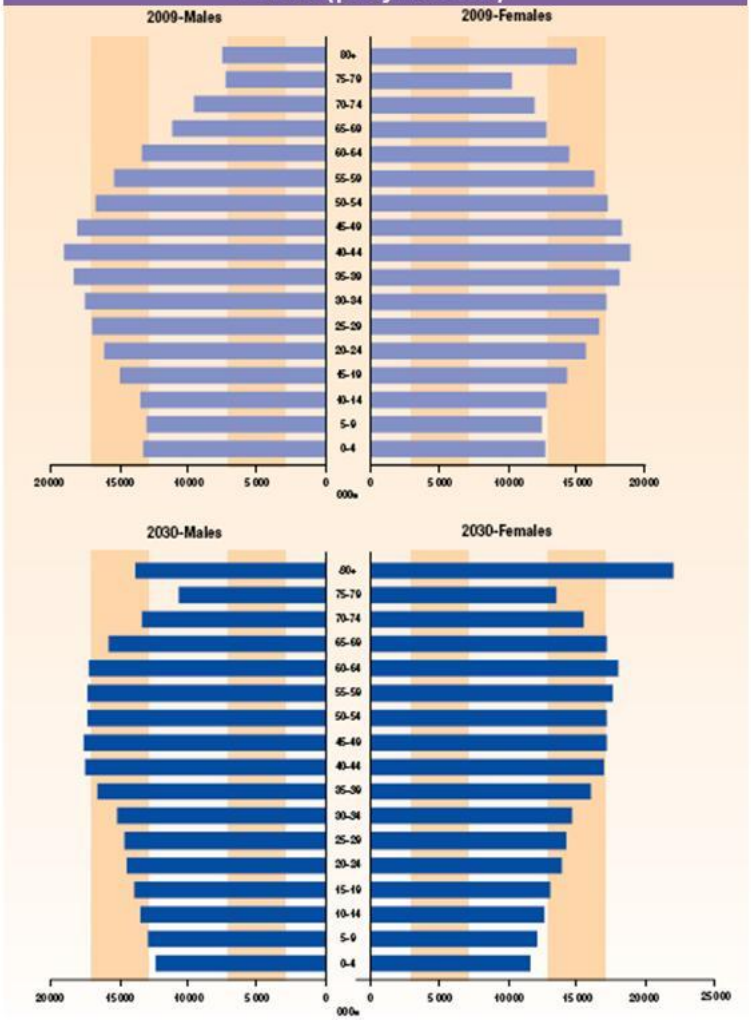
Figure B – Cluster terms across EU countries

Table 1 Countries included in the mapping and terms or phrases

Country	Terms or phrases used to describe clusters
Austria	Cluster, Netzwerk, Unternehmensnetzwerk, Wirtschaftskomplex, Kompetenzzentrum, Technopol
Belgium	Cluster, réseau, d'enterprises
Bulgaria	Клъстери, Свързани производства, Гроздове, промишлени
Czech Republic	Klastr
Cyprus	ΣΥΣΤΑΔΕΣ (Systades), ΘΕΜΑΤΙΚΑ ΙΚΤΥΑ (Thematica
Denmark	Klynger, kompetenceklynger, ressourceområder
Estonia	Klaster
Finland	Osaamiskeskus, osaamiskeskittymä, klusteri, osaamisklusteri, tietämyskeskus, alueellinen innovaatiopolitiikka, toimialaklusteri, teollinen klusteri
France	Pôle de compétitivité
Germany	Cluster
Greece	Βιομηχανικές συστάδες, συνεργατικοί σχηματισμοί
Iceland	Klasi
Ireland	Cluster, network
Israel	MA'AGAD, EGED, ESHKOL
Italy	Distretti industriali
Latvia	Klāsteris, puduris
Lithuania	Klasteris, Žinių ekonomikos branduolys, Integruotas
Luxembourg	Grappe
Malta	Cluster, network
The Netherlands	Cluster
Norway	Klynger, industrielle distrikter, agglomerasjoner
Poland	Klaster, grono, sieć współpracy/sieć współpracy pomiędzy sektorem nauki, samorządami i przedsiębiorcami, lokalny system produkcji, kompleks przemysłowy
Portugal	Cacho, aglomerado
Romania	Entitati din infrastructura de inovare si transfer
Slovakia	Klaster
Slovenia	Mreže, grozdi
Spain	Cluster, Agrupaciones Empresariales Innovadoras, micro-clusters, Unidades Empresariales Productivas, and Sistemas Productivos Locales
Sweden	Kluster, innovationssystem, klusterinitiativ, agglomerationer, industriella distrikt
Switzerland	Cluster
Turkey	Kümelenme
United Kingdom	Cluster

Source: OXFORD RESEARCH AS & EUROPE INNOVA (January 2008), Cluster Policy in Europe- A brief summary of cluster policies in 31 European countries

Figure C – EU Population by age group, 2009 and 2030 (projections)



Source: EUROPEAN COMMISSION (2011), *Innovation Union Competitiveness report*, Office for Official Publications of the European Communities, ISBN: 978-9279145414

Figure D – Overview of the recession, real GDP during 2007-2010

	2007				2008				2009				2010				
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Drop*	Relative drop
EU-27	115.4	115.9	116.6	117.2	117.9	117.6	116.9	114.7	111.9	111.6	111.9	112.2	112.6	113.8	114.3	6.3	5.3
BE	113.7	114	114.4	114.6	115.5	116.1	115.6	113.1	111.2	111.4	112.5	113	113.1	114.3	114.8	4.9	4.2
BG	145.4	147.9	149.9	153	155.4	157.4	159.6	160.4	150.3	150.2	150	149.7	149	149.7	150.8	11.4	7.1
CZ	134.4	135.2	136.9	138.3	138.8	139.8	140	138.8	133.8	133.1	133.8	134.3	135.2	136.2	137.5	6.9	4.9
DK	111.5	110.6	112.2	112.9	111.2	112	110.9	108.1	106.4	103.8	104.2	104.7	105.4	106.7	107.8	9.1	8.1
DE	108.7	109.1	109.9	110.1	111.6	110.9	110.4	108	104.3	104.8	105.5	105.8	106.4	108.9	109.6	7.3	6.5
EE	172.1	172.8	173.5	174.2	170.3	168.5	164	154.7	146.1	140.6	138.8	140.7	142.2	144.8	145.8	35.4	20.3
IE	145.8	144.1	142.7	147.6	143.9	141.2	140.4	134.1	130.7	130.3	129.6	126.6	129.3	128	128.7	21	14.2
EL	131.6	132.2	133.2	134.1	134.4	134.8	134.5	134	132.5	132.1	131.2	129.7	128.9	126.7	125.1	9.7	7.2
ES	125.1	126.1	127.1	127.9	128.5	128.4	127.4	126	124	122.7	122.4	122.2	122.3	122.7	122.7	6.3	4.9
FR	112.8	113.3	114	114.3	114.8	114.1	113.8	112	110.4	110.6	110.8	111.4	111.7	112.3	112.7	4.4	3.8
IT	108.1	108.2	108.4	107.9	108.4	107.7	106.5	104.3	101.3	101.1	101.5	101.4	101.8	102.3	102.6	7.3	6.7
CY	126	127.7	129.2	130.5	131.7	133.2	133.5	133.5	132.2	131	130	130	130.6	131.4	132.2	3.5	2.6
LV	176.7	181.6	185	186.7	181.2	177.9	174.8	167.8	148.8	146.8	140.7	139.8	141.3	143	144.2	46.9	25.1
LT	164.4	170.2	175.9	176.5	178.2	179	175.7	173.5	153.5	150.3	150.2	148.6	150.6	152.1	152.6	30.4	17.0
LU	130.9	132.9	134.1	136.1	138.6	137.8	135.3	130.1	130.9	127	131.2	132.9	132.8	134	135.9	11.6	8.4
HU	126.5	126.4	126.8	127.5	129	128.7	127.5	124.7	120.8	119.3	118.3	118.3	119.5	119.9	120.9	10.7	8.3
MT	113.1	113.7	114.5	115.1	116.8	117.9	117.8	116	114	114	115	116.8	118.5	118.6	119.2	3.9	3.3
NL	113.2	113.8	115.1	116.7	117.6	117.3	117	115.6	112.9	111.4	112.2	112.8	113.4	114.4	114.3	6.2	5.3
AT	115.8	116.1	116	117.5	119.7	120	118.8	116.9	114.5	113.5	114.1	114.6	114.6	115.9	117	6.5	5.4
PL	128.8	131	132.7	135.6	137.5	138.5	139.6	139	139.6	140.3	140.9	142.9	143.9	145.7	147.6	0.6	0.4
PT	107.9	107.9	107.8	108.8	108.9	108.8	108.1	106.7	104.9	105.5	105.8	105.6	106.7	107	107.3	4	3.7
RO	147.1	148.9	150.1	155	160.9	163.3	162.6	159	152.4	150.2	150.3	148	147.5	148	147	16.3	10.0
SI	132.5	134.7	137.4	138.5	140.8	141.8	142.1	137.4	129.1	128.3	128.8	128.9	128.8	130.1	130.5	13.8	9.7
SK	145.7	149.4	153.2	161.2	158.9	160.4	162.4	163.3	150.8	152.5	154.3	156.4	157.7	159.3	160.8	12.5	7.7
FI	122.9	124.6	125.8	127	127.4	127.6	127.1	123.1	116.2	114.9	116.4	116.8	116.9	119.9	120.5	12.7	10.0
SE	121.9	122.6	123.4	124.8	123.5	123.5	123.5	118.4	115.3	115.7	115.6	116.5	118.5	120.9	123.4	9.5	7.6
UK	118.5	119.2	119.8	120.1	120.7	120.4	119.3	116.8	114.2	113.3	113	113.5	113.9	115.2	116	7.7	6.4

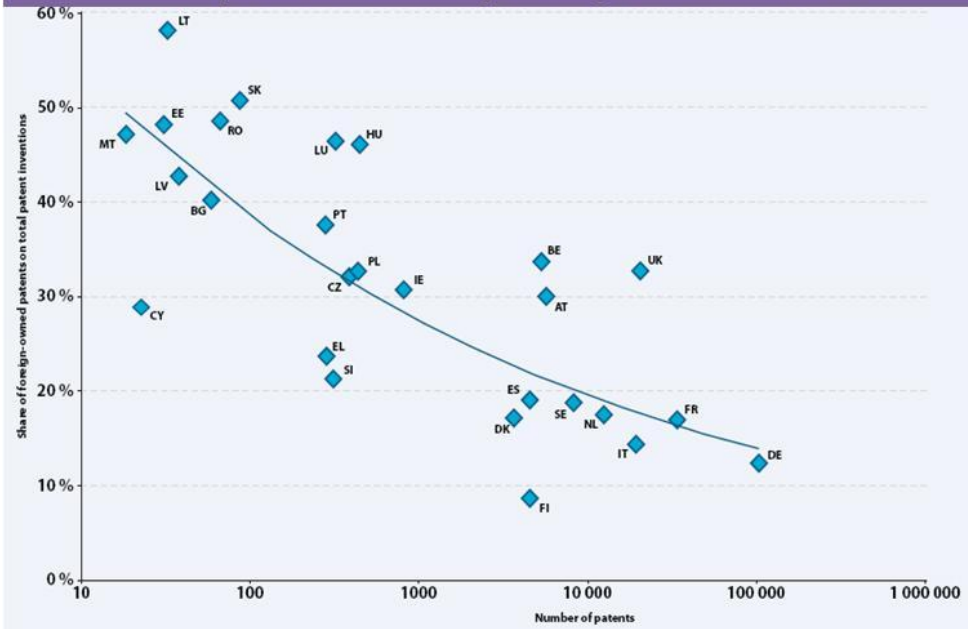
Source: EUROPEAN COMMISSION (2011), *European Competitiveness Report 2011,* Office for Official Publications of the European Communities, ISBN: 978-9279216916, p.33

Figure E – Employment during 2007-2010

	2007				2008				2009				2010				
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Drop	Rel. drop[b]
27	106.5	108.2	109.4	109.0	108.6	109.6	110.5	109.5	107.5	107.9	107.9	107.3	105.9	107.2	107.7	4.5	4.1
BE	105.5	105.4	106.3	107.9	107.9	107.0	108.4	108.2	107.3	106.8	107.1	108.0	108.3	107.8	108.8	1.6	1.5
BG	109.3	113.3	115.5	115.2	114.5	117.3	119.0	117.1	113.7	115.0	114.3	110.5	105.0	107.1	108.2	14.0	11.8
CZ	104.0	105.1	105.6	106.2	106.0	107.0	107.2	107.6	105.8	105.6	105.2	105.3	103.2	104.3	105.0	4.5	4.1
DK	102.7	103.7	103.3	103.2	103.4	105.5	105.5	105.1	103.1	102.6	102.9	100.1	99.5	100.9	100.4	6.0	5.7
DE	103.1	104.8	106.3	106.5	105.5	105.9	108.3	108.3	106.0	106.3	106.5	108.2	105.5	106.2	107.0	2.8	2.6
EE	113.8	115.9	116.5	115.0	115.5	115.5	116.2	114.8	107.7	104.3	105.2	102.1	97.4	98.3	101.7	19.1	16.4
IE	124.5	125.8	128.5	128.0	127.8	126.2	126.6	122.4	116.8	115.4	114.5	112.2	110.2	111.3	110.8	18.4	14.3
EL	108.8	110.2	110.7	110.2	110.0	111.7	111.9	111.0	109.4	110.5	110.7	109.2	107.9	107.9	107.3	4.6	4.1
ES	129.9	131.9	132.8	132.6	132.1	132.3	131.8	128.6	123.6	122.7	122.2	120.7	119.1	119.6	120.1	13.7	10.3
FR	108.9	110.5	111.6	111.2	111.3	112.3	112.8	111.8	110.8	111.7	111.6	110.5	110.5	111.6	112.1	2.3	2.1
IT	109.2	111.4	111.9	111.5	110.7	112.7	112.4	111.6	109.8	110.9	110.0	109.6	108.8	109.9	108.9	3.9	3.5
CY	125.9	128.7	129.3	130.9	129.0	130.6	129.9	131.2	128.3	130.3	130.1	130.4	129.1	131.8	131.1	2.9	2.2
LV	115.4	117.9	120.3	122.3	121.1	121.5	120.5	115.5	111.4	106.3	101.5	99.2	97.6	99.6	102.2	24.7	20.2
LT	106.6	109.2	110.4	107.7	106.8	107.9	108.8	106.6	101.3	100.5	100.8	97.9	94.0	94.0	95.6	16.4	14.9
LU	112.0	111.0	113.3	112.6	109.8	115.3	112.5	110.0	118.6	120.8	120.5	119.7	121.1	121.1	122.6	3.4	3.0
HU	102.6	103.6	103.7	102.7	101.0	101.6	103.1	101.9	98.9	99.8	99.4	99.4	97.7	99.3	100.4	6.0	5.8
MT	107.1	110.2	110.2	109.7	110.3	111.9	113.9	112.2	112.8	112.7	113.6	113.8	114.7	115.6	115.2	1.7	1.5
NL	106.3	107.6	108.3	108.1	108.1	109.0	109.7	110.1	109.9	109.4	108.9	108.8	107.5	108.6	106.7	3.4	3.1
AT	106.2	108.5	110.1	108.4	108.0	110.4	111.2	110.2	108.1	109.7	110.7	109.9	108.1	109.7	111.5	3.1	2.8
PL	102.3	104.5	106.4	107.1	107.0	108.2	110.2	110.3	108.3	109.2	110.4	109.6	107.4	110.2	111.7	3.0	2.8
PT	102.3	102.6	103.5	103.4	103.4	104.1	103.4	103.0	101.6	101.2	99.8	99.9	99.6	99.3	98.7	5.4	5.2
RO	85.8	89.0	91.3	86.4	85.9	89.5	90.7	87.0	85.2	88.4	89.8	85.1	84.2	89.4	89.4	7.1	7.8
SI	107.0	110.8	112.3	109.8	108.7	110.9	114.3	112.0	107.6	109.4	111.1	109.7	108.0	108.3	108.2	6.7	5.9
SK	111.7	112.2	113.6	115.1	114.8	115.4	118.7	118.3	114.7	114.1	113.6	111.8	109.5	111.0	112.0	9.1	7.7
FI	102.0	106.6	107.4	105.0	104.5	108.7	108.4	106.0	103.4	105.5	104.6	101.7	100.9	105.0	105.2	7.8	7.2
SE	107.4	110.1	112.4	110.3	109.6	112.1	113.3	110.4	108.3	109.7	110.2	108.1	107.5	110.4	112.3	5.8	5.1
UK	105.9	106.3	107.2	107.7	107.5	107.7	107.8	107.6	106.5	105.6	106.1	106.1	105.1	105.7	106.9	2.7	2.5

Source: EUROPEAN COMMISSION (2011), *European Competitiveness Report 2011,* Office for Official Publications of the European Communities, ISBN: 978-9279216916, p.34

Figure F – Share of foreign-owned patent inventions and total number of patent inventions by country, 2003-2007, EPO



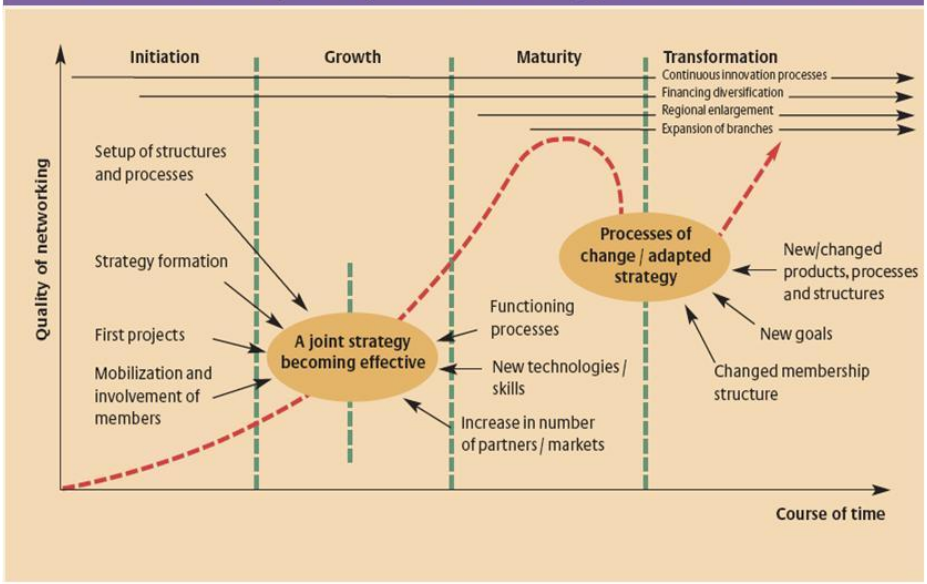
Source: EUROPEAN COMMISSION (2010), *European Competitiveness Report 2010,* Office for Official Publications of the European Communities, ISBN: 978-9279176203 p. 94

Figure G – Europe 2020 'flagship initiatives'

1.	Innovation Union The aim of this is to re-focus R&D and innovation policy on the challenges facing our society, such as climate change, energy and resource efficiency, health and demographic change. Every link should be strengthened in the innovation chain, from "blue sky" research to commercialization.
2.	Youth on the move The aim is to enhance the performance and international attractiveness of Europe's higher education institutions and raise the overall quality of all levels of education and training in the EU, combining both excellence and equity, by promoting student mobility and trainee mobility, and improve the employment situation of young people.
3.	A Digital Agenda for Europe The aim is to deliver sustainable economic and social benefits from a Digital Single Market based on fast and ultra fast Internet and interoperable applications, with broadband access for all by 2013, access for all to much higher Internet speeds (30 Mbps or above) by 2020, and 50% or more of European households subscribing to Internet connections above 100 Mbps.
4.	Resource efficient Europe The aim is to support the shift towards a resource efficient and low-carbon economy that is efficient in the way it uses all resources. The aim is to decouple our economic growth from resource and energy use, reduce CO2 emissions, enhance competitiveness and promote greater energy security.
5.	An industrial policy for the globalization era The framework will address all elements of the increasingly international value chain from access to raw materials to after-sales service.
6.	An agenda for new skills and jobs The aim is to create conditions for modernizing labour markets with a view to raising employment levels and ensuring the sustainability of our social models.
7.	European Platform against Poverty The aim is to ensure economic, social and territorial cohesion, building on the current European Year for Combating Poverty and Social Exclusion so as to raise awareness and recognize the fundamental rights of people experiencing poverty and social exclusion, enabling them to live in dignity and take an active part in society.

Source: SAMARDZIJA V. & BUTKOVIC H. (2010), From the Lisbon strategy to Europe 2020, Institute for International Relations, Zagreb, ISBN: 978-9536096534

Figure H – Phase-specific processes of stratgey formation in clusters



Source: KOMPETENZNETZE DEUTSCHLAND (February 2010), *Cluster Management Excellence- Volume 2: Sustainability and Effectiveness of Clusters and Networks,* Federal Ministry of Economics

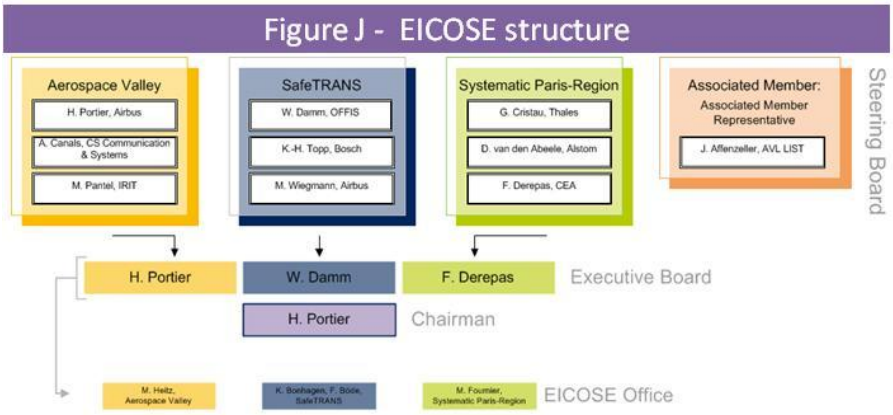
Figure I – Summary of resuts from natonal studies

Country	Criteria used to identify clusters	Number of clusters identified	Relative importance of clusters	Cluster development compared to national average
Austria	1) Orientation of consumer, horizontal and vertical relationships. 2) Determination of international competitiveness	16 industrial clusters		
Denmark	Qualitative interviews of 75 informants supplemented by quantitative indicators of growing firms and export specialisation	13 regional competence clusters and 16 national ones		Probably better performance
Finland	Inter-industry linkages between 68 industries, plus data on export ratios and investments	9 key national clusters		
France	Local production systems (LPS) are characterised by (i) a local concentration of SMEs, (ii) SMEs belong to one or a few industries or activities, (iii) the firms co-operate and compete, (iv) the local area includes related activities such as business services or R&D, and (v) players in the area share a common 'culture'.	144 existing LPS and 82 emerging or virtual LPS		Generally, LPS seem to have an equal or better growth than the national average
Italy	Industrial districts are local labour systems that (i) have a larger than average share of workers in manufacturing, (ii) are specialised in a manufacturing sector, and (iii) have a high concentration of workers in SMEs	199 industrial districts (in 1991)	42.5 % of the total labour force in manufacturing	In almost every manufacturing sector productivity and profitability are considerably higher for ID firms
Netherlands	Clusters of related economic activities have been identified by linking main suppliers of goods and services to main users. This is achieved by the use of (i) inter-industry linkages between 214 industry groups, and (ii) 'make & use analyses' for 650 product categories and 260 categories of economic activities.	12 large conglomerates of inter-linked industry groups	Make up nearly 30 % of the national product	
Norway	Potential regional clusters fulfil three criteria: (i) they consist of labour-market regions, (ii) the labour-market regions are specialised in at least one of 39 industrial sectors (having a location quotient equal to or higher than 3.0), and (iii) the 'specialised' sector must include at least 200 jobs and 10 firms in the region.	55 clusters in manufacturing, 62 in total	22 % of national employment in manufacturing	Slightly better employment growth in clusters
Portugal	Industrial sectors with export specialisation, seen as se ctors where the country has a comparative advantage	Some key sectors have been identified, constituting 33 regional clusters		Some clusters have a high level of development, while others reveal structural weaknesses. Nonetheless, all clusters are considered to represent an important store of knowledge, upon the basis of which stronger export positions can be built.
Spain	Local production systems have been identified by the local/regional concentration of SMEs, belonging to one or a few industries, where firms often collaborate through close supply-chain relationships. Interestingly, and in most cases, local/regional players share a common set of business values and cultural attitudes.	142 local production systems		Analyses of local production systems indicate that firms in these systems have a higher share of 'skilled' personnel in comparison to the national average.
United Kingdom	The *main* steps are: (i) Identification of 'regional highs', i.e. 5 digit ISIC sectors which have a location quotient over 1.25 and/or over 0.2 % of the regional workforce, (ii) grouping of identified sectors into clusters, and (iii) extensive interviews with representatives of 'clusters', regional agencies, research institutes etc. to clarify to what extent the clusters of 'regional highs' may constitute clusters	154 (potential) regional clusters	Ranging from 40 % of the region's employment in London to 15 % in the North West	In general no better job creation performance than the regional average.

* The national studies involve different definitions of clusters and different approaches to identifying the clusters.

Source: EUROPEAN COMMISSION (2011), *Regional Clusters in Europe: Observatory of European SMEs*, 2002, No. 3, Dictus Publishing, ISBN: 978-3844370584

Figure J - EICOSE structure



Source: http://www.eicose.eu/index.php?id=structure (03.07.2012)

Figure K – ESCA Benchmarking indicators

STRUCTURE OF THE CLUSTER
Age of the cluster organisation
Legal form of the cluster organisation
Nature of the cluster: driving forces
Nature of the cluster: degree of specialisation
Composition of the cluster participants (Committed participants)
Geographical concentration of the cluster participants (Committed participants)
Utilisation of regional growth potential
International participants of the cluster
Nature of cooperation between cluster participants
CLUSTER MANAGEMENT AND GOVERNANCE / STRATEGY OF THE CLUSTER ORGANISATION
Clear definition of the roles of the cluster manager / implementation of a governing body / Degree of involvement of the participants of the cluster in the decision making process.
Number of cluster participants per employee (full-time equivalents) of the cluster organisation
Human resource competences and development in the cluster organisation
Strategic planning and implementation processes
Thematic and geographical priorities of the cluster strategy
FINANCING OF THE CLUSTER MANAGEMENT
Repartition of the different financial sources (public funding, chargeable services, membership fees and other private sources) in the total budget of the cluster organisation in relation to the age of the cluster
Financial sustainability of the cluster organisation
SERVICES PROVIDED BY THE CLUSTER ORGANISATION (SPECTRUM AND INTENSITY)
Acquisition of third party funding
Collaborative technology development, technology transfer or R&D without third party funding
Information, matchmaking and exchange of experience among participants
Development of human resources
Development of entrepreneurship
Matchmaking and networking with external partners / promotion of cluster location
Internationalisation of cluster participants
CONTACTS AND INTERACTION WITH RELEVANT PLAYERS
Regular contacts with cluster participants
Integration of the cluster management organisation in the local and national system of innovation
Customer and membership satisfaction
ACHIEVEMENTS AND RECOGNITION OF THE CLUSTER ORGANISATION
Number of external cooperation requests received by the cluster organisation
Institutional origin of external cooperation requests
Geographical origin of external cooperation requests
Characteristics of cooperation with other international clusters
Visibility in the press
Impact of the work of the cluster organisation on R&D activities of the cluster participants
Impact of the work of the cluster organisation on business activities of the cluster participants
Impact of the business-oriented services of the cluster organisation on SME participants
Degree of internationalisation of cluster participants
Impact of the work of the cluster organisation on international activities of the cluster participants

Source: http://www.cluster-analysis.org/benchmarking-in-a-nutshell/Overviewofclusterbenchmarkingindicators.pdf (03.07.2012)

11.2. Survey A & B & C

Survey A: Clusters and Cluster organisations

Introduction

This research will investigate the collaboration between clusters in the European Union.

The survey should take less than 15 minutes to complete.

All information will be kept anonymously and will only be used for statistical purposes. If you participate in this survey you will receive the statistical results in September 2012.

If you have further questions about the purpose, procedures or outcomes of this research or you would prefer a face-to-face or telephone interview, please contact claudine.bettendroffer@grenoble-em.com

Thank you in advance for participating in this important research project.

***1. Please enter your email address**
(This information is required in order to send you the results of the survey)

***2. Please enter the name of your cluster/ cluster organisation**

Cluster benchmarking

This information will be used to identify the position of your clusters against other clusters in the European Union.

3. In which country/ countries is the cluster present?

- ☐ Austria
- ☐ Belgium
- ☐ Bulgaria
- ☐ Cyprus
- ☐ Czech Republic
- ☐ Denmark
- ☐ Estonia
- ☐ Finland
- ☐ France
- ☐ Germany
- ☐ Greece
- ☐ Hungary
- ☐ Ireland
- ☐ Italy
- ☐ Latvia
- ☐ Lithuania
- ☐ Luxembourg
- ☐ Malta
- ☐ Netherlands
- ☐ Poland
- ☐ Portugal
- ☐ Romania
- ☐ Slovakia
- ☐ Slovenia
- ☐ Spain
- ☐ Sweden
- ☐ United Kingdom
- ☐ Other European States
- ☐ Non European States

4. In which industry/ industries is the cluster present?

- ☐ Aerospace
- ☐ Agro-food
- ☐ Automotive
- ☐ Biotechnology
- ☐ Business & financial services
- ☐ Chemical
- ☐ Construction
- ☐ Creative
- ☐ Electronics/Electrical equipment
- ☐ Energy
- ☐ Environment/green technologies
- ☐ Footwear & leather
- ☐ Healthcare & medical devices
- ☐ ICT
- ☐ Logistics
- ☐ Maritime
- ☐ Materials/ New Materials
- ☐ Mechatronics
- ☐ Media
- ☐ Metal Processing & manufacturing
- ☐ Micro & nanotechnology
- ☐ Mining
- ☐ Optics & Photonics
- ☐ Packaging
- ☐ Plastics
- ☐ Printing
- ☐ Production Technology
- ☐ Railway
- ☐ Security
- ☐ Software
- ☐ Telecommunications
- ☐ Textile
- ☐ Tourism
- ☐ Paper/Wood/Furniture

Other (please specify)

5. The cluster in numbers
(Please fill in approximate numbers)

Number of member companies	
Number of member universities	
Number of member research organisations:	
Number of incubators involved	
Number of employees in the cluster	
Approximate Turnover of the cluster	

Cluster network

6. How important are these factors for your cluster?

	Crucial	Very important	Moderately important	Not important	Not sure
Cluster management excellence	☐	☐	☐	☐	☐
Innovation and research	☐	☐	☐	☐	☐
Cluster collaboration and linkages	☐	☐	☐	☐	☐
European policy and initiatives	☐	☐	☐	☐	☐
An important website	☐	☐	☐	☐	☐

7. Which funding source was, is or will be the most important for your cluster ? (Tick what applies)

	at the emergence of the cluster	now	in the future
European funding	☐	☐	☐
Regional programs and initiatives	☐	☐	☐
National programs and initiatives	☐	☐	☐
Venture capital firms	☐	☐	☐
Business angels	☐	☐	☐

Other (please specify)

8. Is the cluster member of any of the following cluster or innovation platforms? (Check all that apply)

- ☐ Enterprise Europe Network
- ☐ European Cluster Alliance
- ☐ European Cluster Collaboration Platform
- ☐ European Cluster Observatory
- ☐ TCI Europe

Other (please specify)

Cluster collaboration

***9. What are the cluster with which you collaborate? Please name them (If you do not collaborate, please name the reasons why not)**

10. From which countries are the clusters you collaborate?
(Please ignore if you do not collaborate)

- ☐ Austria
- ☐ Belgium
- ☐ Bulgaria
- ☐ Cyprus
- ☐ Czech Republic
- ☐ Denmark
- ☐ Estonia
- ☐ Finland
- ☐ France
- ☐ Germany
- ☐ Greece
- ☐ Hungary
- ☐ Ireland
- ☐ Italy
- ☐ Latvia
- ☐ Lithuania
- ☐ Luxembourg
- ☐ Malta
- ☐ Netherlands
- ☐ Poland
- ☐ Portugal
- ☐ Romania
- ☐ Slovakia
- ☐ Slovenia
- ☐ Spain
- ☐ Sweden
- ☐ United Kingdom
- ☐ Other European States
- ☐ Non European States

11. From which industries are the clusters you are collaborating?
(Please ignore if you do not collaborate)

- ☐ Aerospace
- ☐ Agro-food
- ☐ Automotive
- ☐ Biotechnology
- ☐ Business & financial services
- ☐ Chemical
- ☐ Construction
- ☐ Creative
- ☐ Electronics/Electrical equipment
- ☐ Energy
- ☐ Environment/green technologies
- ☐ Footwear & leather
- ☐ Healthcare & medical devices
- ☐ ICT
- ☐ Logistics
- ☐ Maritime
- ☐ Materials/ New Materials
- ☐ Mechatronics
- ☐ Media
- ☐ Metal Processing & manufacturing
- ☐ Micro & nanotechnology
- ☐ Mining
- ☐ Optics & Photonics
- ☐ Packaging
- ☐ Plastics
- ☐ Printing
- ☐ Production Technology
- ☐ Railway
- ☐ Security
- ☐ Software
- ☐ Telecommunications
- ☐ Textile
- ☐ Tourism
- ☐ Paper/Wood/Furniture

Other (please specify)

12. Which of the following benefits of cooperating with other clusters are important for you?

	crucial	very important	moderately important	not important	not sure
Better access to finance	◯	◯	◯	◯	◯
Access to new markets	◯	◯	◯	◯	◯
Exchange of experiences and knowledge	◯	◯	◯	◯	◯
Gain of reputations	◯	◯	◯	◯	◯
Cost reduction	◯	◯	◯	◯	◯
Joined R&D	◯	◯	◯	◯	◯
Networking	◯	◯	◯	◯	◯
Integrated supply chain	◯	◯	◯	◯	◯

13. What are the main barriers to cluster collaboration according to your personal opinion?

	No barrier	Certain barrier	Huge barrier	Not sure
Different cultural backgrounds	◯	◯	◯	◯
Different languages	◯	◯	◯	◯
Low interest in collaboration	◯	◯	◯	◯
Economic imbalances between EU member countries	◯	◯	◯	◯
Collaboration is too expensive (Travel,...)	◯	◯	◯	◯
Not enough support programs for collaboration	◯	◯	◯	◯
Administrative and regulatory barriers	◯	◯	◯	◯
Lack of knowledge about other clusters	◯	◯	◯	◯
Concerns about losing independence	◯	◯	◯	◯
Risk to invest ressources into wrong direction	◯	◯	◯	◯

To go one step further

14. How strong do you agree or disagree with the following statements?

	strongly agree	neither agree or disagree	strongly disagree	not sure
Clusters promote European businesses over regional boundaries	◯	◯	◯	◯
Regional competitiveness is a necessary precondition for EU competitiveness	◯	◯	◯	◯
Cluster cooperation is essential for a more competitive European Union	◯	◯	◯	◯
The EU strategy towards world-class clusters is the right way towards the future	◯	◯	◯	◯
Collaboration among clusters can stabilize the EU agaist a future crisis	◯	◯	◯	◯
Hubs of clusters or interclusters could be the ultimate form for collaboration in Europe	◯	◯	◯	◯

15. What do you think needs to be improved in the future in order that your cluster can be more competitive?

16. In what do you see the challenges of the future EU?

Thank you very much for your participation in this survey

Survey B: Cluster networks

Introduction

This research will investigate the collaboration between clusters in the European Union.

The survey should take less than 15 minutes to complete.

All information will be kept anonymously and will only be used for statistical purposes. If you participate in this survey you will receive the statistical results in September 2012.

If you have further questions about the purpose, procedures or outcomes of this research or you would prefer a face-to-face or telephone interview, please contact claudine.bettendroffer@grenoble-em.com

Thank you in advance for participating in this important research project.

***1. Please enter your email address**
(This information is required in order to send you the results of the survey)

***2. Please enter the name of your network of clusters**

Network information

3. In which country/ countries are the clusters of your network present?

- ☐ Austria
- ☐ Belgium
- ☐ Bulgaria
- ☐ Cyprus
- ☐ Czech Republic
- ☐ Denmark
- ☐ Estonia
- ☐ Finland
- ☐ France
- ☐ Germany
- ☐ Greece
- ☐ Hungary
- ☐ Ireland
- ☐ Italy
- ☐ Latvia
- ☐ Lithuania
- ☐ Luxembourg
- ☐ Malta
- ☐ Netherlands
- ☐ Poland
- ☐ Portugal
- ☐ Romania
- ☐ Slovakia
- ☐ Slovenia
- ☐ Spain
- ☐ Sweden
- ☐ United Kingdom
- ☐ Other European States
- ☐ Non European States

4. In which industry/ industries are they present?

- ☐ Aerospace
- ☐ Agro-food
- ☐ Automotive
- ☐ Biotechnology
- ☐ Business & financial services
- ☐ Chemical
- ☐ Construction
- ☐ Creative
- ☐ Electronics/Electrical equipment
- ☐ Energy
- ☐ Environment/green technologies
- ☐ Footwear & leather
- ☐ Healthcare & medical devices
- ☐ ICT
- ☐ Logistics
- ☐ Maritime
- ☐ Materials/ New Materials
- ☐ Mechatronics
- ☐ Media
- ☐ Metal Processing & manufacturing
- ☐ Micro & nanotechnology
- ☐ Mining
- ☐ Optics & Photonics
- ☐ Packaging
- ☐ Plastics
- ☐ Printing
- ☐ Production Technology
- ☐ Railway
- ☐ Security
- ☐ Software
- ☐ Telecommunications
- ☐ Textile
- ☐ Tourism
- ☐ Paper/Wood/Furniture

Other (please specify)

5. The network in numbers

(Please fill in approximate numbers)

Number of clusters	
Number of companies	
Number of universities	
Number of research organisations	
Number of incubators involved	
Number of employees in total	
Approximate Turnover in total	

Cluster networking

6. How important are these factors for the clusters in your network?

	Crucial	Very important	Moderately important	Not important	Not sure
Cluster management excellence	☐	☐	☐	☐	☐
Innovation and research	☐	☐	☐	☐	☐
Cluster collaboration and linkages	☐	☐	☐	☐	☐
European policy and initiatives	☐	☐	☐	☐	☐
An important website	☐	☐	☐	☐	☐

7. Do you have a cluster or sector in your network to which you give priority?

8. Is your network member of any of the following cluster or innovation platforms? (Check all that apply)

- ☐ Enterprise Europe Network
- ☐ European Cluster Alliance
- ☐ European Cluster Collaboration Platform
- ☐ European Cluster Observatory
- ☐ TCI Europe

Other (please specify)

Cluster collaboration

9. Which of the following benefits of cooperating with clusters do you consider as the main purposes of your network?

	crucial	very important	moderately important	not important	not sure
Better access to finance	◯	◯	◯	◯	◯
Access to new markets	◯	◯	◯	◯	◯
Exchange of experiences and knowledge	◯	◯	◯	◯	◯
Gain of reputations	◯	◯	◯	◯	◯
Cost reduction	◯	◯	◯	◯	◯
Joined R&D	◯	◯	◯	◯	◯
Networking	◯	◯	◯	◯	◯
Integrated supply chain	◯	◯	◯	◯	◯

Other (please specify)

10. What are the main barriers to cluster collaboration according to your personal opinion?

	No barrier	Certain barrier	Huge barrier	Not sure
Different cultural backgrounds	◯	◯	◯	◯
Different languages	◯	◯	◯	◯
Low interest in collaboration	◯	◯	◯	◯
Economic imbalances between EU member countries	◯	◯	◯	◯
Collaboration is too expensive (Travel,...)	◯	◯	◯	◯
Not enough support programs for collaboration	◯	◯	◯	◯
Administrative and regulatory barriers	◯	◯	◯	◯
Lack of knowledge about other clusters	◯	◯	◯	◯
Concerns about losing independence	◯	◯	◯	◯
Risk to invest ressources into wrong direction	◯	◯	◯	◯

To go one step further

11. How strong do you agree or disagree with the following statements?

	strongly agree	neither agree or disagree	strongly disagree	not sure
Clusters promote European businesses over regional boundaries	◯	◯	◯	◯
Regional competitiveness is a necessary precondition for EU competitiveness	◯	◯	◯	◯
Cluster cooperation is essential for a more competitive European Union	◯	◯	◯	◯
The EU strategy towards world-class clusters is the right way towards the future	◯	◯	◯	◯
Collaboration among clusters can stabilize the EU agaist a future crisis	◯	◯	◯	◯
Hubs of clusters or interclusters could be the ultimate form for collaboration in Europe	◯	◯	◯	◯

12. What do you think needs to be improved in the future in order that your cluster can be more competitive?

13. In what do you see the challenges of the future EU?

Thank you very much for your participation in this survey

Survey C: External partners of clusters

Introduction

This research will investigate the collaboration between clusters in the European Union.

The survey should take less than 15 minutes to complete.

All information will be kept anonymously and will only be used for statistical purposes. If you participate in this survey you will receive the statistical results in September 2012.

If you have further questions about the purpose, procedures or outcomes of this research or you would prefer a face-to-face or telephone interview, please contact claudine.bettendroffer@grenoble-em.com

Thank you in advance for participating in this important research project.

***1. Please enter your email address**
(This information is required in order to send you the results of the survey)

***2. Please enter the name of your organisation**

Organisation information

3. What type of organisation are you?

- ◯ Development agency
- ◯ Business incubator
- ◯ Government/ Ministry
- ◯ Chamber of Commerce
- ◯ European institution
- ◯ Research organisation
- ◯ Science Park
- ◯ University
- ◯ Venture capital firm
- ◯ Business angel
- ◯ Consulting firm
- ◯ Expert

Other (please specify)

4. In which country/ countries are you present?

☐ Austria	☐ Greece	☐ Portugal
☐ Belgium	☐ Hungary	☐ Romania
☐ Bulgaria	☐ Ireland	☐ Slovakia
☐ Cyprus	☐ Italy	☐ Slovenia
☐ Czech Republic	☐ Latvia	☐ Spain
☐ Denmark	☐ Lithuania	☐ Sweden
☐ Estonia	☐ Luxembourg	☐ United Kingdom
☐ Finland	☐ Malta	☐ Other European States
☐ France	☐ Netherlands	☐ Non European States
☐ Germany	☐ Poland	

About clusters

5. How important do you consider these factors for clusters?

	Crucial	Very important	Moderately important	Not important	Not sure
Cluster management excellence	☐	☐	☐	☐	☐
Innovation and research	☐	☐	☐	☐	☐
Cluster collaboration and linkages	☐	☐	☐	☐	☐
European policy and initiatives	☐	☐	☐	☐	☐
An important website	☐	☐	☐	☐	☐

6. Are you a member of any of the following cluster or innovation platforms? (Check all that apply)

- ☐ Enterprise Europe Network
- ☐ European Cluster Alliance
- ☐ European Cluster Collaboration Platform
- ☐ European Cluster Observatory
- ☐ TCI Europe

Other (please specify)

Cluster collaboration

7. How important do you consider the following benefits of cluster cooperation?

	crucial	very important	moderately important	not important	not sure
Better access to finance	◯	◯	◯	◯	◯
Access to new markets	◯	◯	◯	◯	◯
Exchange of experiences and knowledge	◯	◯	◯	◯	◯
Gain of reputations	◯	◯	◯	◯	◯
Cost reduction	◯	◯	◯	◯	◯
Joined R&D	◯	◯	◯	◯	◯
Networking	◯	◯	◯	◯	◯
Integrated supply chain	◯	◯	◯	◯	◯

Other (please specify)

8. What are the main barriers to cluster collaboration according to your personal opinion?

	No barrier	Certain barrier	Huge barrier	Not sure
Different cultural backgrounds	◯	◯	◯	◯
Different languages	◯	◯	◯	◯
Low interest in collaboration	◯	◯	◯	◯
Economic imbalances between EU member countries	◯	◯	◯	◯
Collaboration is too expensive (Travel,...)	◯	◯	◯	◯
Not enough support programs for collaboration	◯	◯	◯	◯
Administrative and regulatory barriers	◯	◯	◯	◯
Lack of knowledge about other clusters	◯	◯	◯	◯
Concerns about losing independence	◯	◯	◯	◯
Risk to invest ressources into wrong direction	◯	◯	◯	◯

To go one step further

9. How strong do you agree or disagree with the following statements?

	strongly agree	neither agree or disagree	strongly disagree	not sure
Clusters promote European businesses over regional boundaries	◯	◯	◯	◯
Regional competitiveness is a necessary precondition for EU competitiveness	◯	◯	◯	◯
Cluster cooperation is essential for a more competitive European Union	◯	◯	◯	◯
The EU strategy towards world-class clusters is the right way towards the future	◯	◯	◯	◯
Collaboration among clusters can stabilize the EU agaist a future crisis	◯	◯	◯	◯
Hubs of clusters or interclusters could be the ultimate form for collaboration in Europe	◯	◯	◯	◯

10. What do you think needs to be improved in the future in order that your cluster can be more competitive?

11. In what do you see the challenges of the future EU?

Thank you very much for your participation in this survey

11.3. Email invitation to recipients of the survey

Dear member of a cluster network

I am currently writing my Master's thesis about the cooperation of clusters in the European Union and would be happy if you could take some of your time to complete a survey which should take less than 15 minutes to complete and will be kept totally anonymously.

If you are not by any measure related to clusters, I am sorry for the inconvenience caused and would kindly ask you to ignore this email or forward it to any people you find more adequate to answer the survey.

This research will investigate the collaboration between clusters and there situation in the European Union. It is clear that clusters are a crucial element in the further development of the European Union, but how important are they really? Is collaboration already a priority for clusters, or are there to many barriers for any successful collaboration? Which sectors collaborate with which other industries?

- If you are a cluster or cluster organization please follow the link below to the survey: https://www.surveymonkey.com/s/6GDRV83

- If you are a network of clusters or an organization regrouping more than one cluster please follow the following link: https://www.surveymonkey.com/s/RGCDX63

- If you are an external partner of a cluster such as a business incubator, chamber of commerce or government, national agency or venture capital firm, research organization or university, or an individual expert on clusters, please follow the link below for the survey: https://www.surveymonkey.com/s/RGWYXY9

Naturally if you are willing to participate in this survey, you will receive the statistical results in September 2012. The survey should take less than 15 minutes to complete and all information will be kept anonymously. Final deadline for the survey will be the **15th July 2012**.

If you have further questions about the purpose, procedures or outcomes of this research or you would prefer a face-to-face or telephone interview, please contact claudinebet@hotmail.com.

Thank you in advance for participating in this important research project.

Kind regards,

Bettendroffer Claudine

(student at the London School of Business and Finance)

12.GLOSSARY

ADAM SMITH'S INVISIBLE HAND: in a free market each participant will try to maximize self-interest, and the interaction of market participants, leading to exchange of goods and services, enables each participant to be better of than when simply producing for himself/herself.[148]

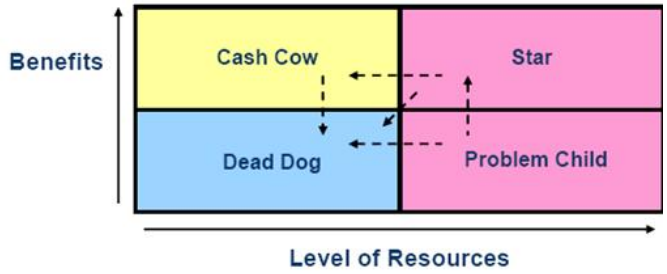
ABC EUROPE: networks European Agro-Biotech Clusters. (*Figure 74*) More information on http://www.europe-innova.eu/web/guest/cluster-cooperation/cluster-innovation-platform/abceurope/about;jsessionid=6535FBC8610C5786A3D5A23CD2562A13

ASEAN: The Association of Southeast Asian Nations was established on 8 August 1967 in Thailand with founding members Indonesia, Malaysia, Philippines, Singapore and Thailand to accelerate growth, social progress and cultural development in the region.[149]

BELCAR: Project of Europe INNOVA to Bench Learning in Cluster management for the Automotive sector in European regions, more information on http://archive.europe-innova.eu/index.jsp?type=page&lg=en&classificationId=5170&classificationName=BeLCAR&cid=5113

BOSTON STRATEGY MATRIX: Each opportunity should be positioned and regularly reviewed. Activity positioned in the Dead dog boxed should be stopped immediately, star opportunities represent high growth potential, cash cows represent high benefits with low investments and problem child opportunities may have potential but would require substantial investments.

Matrix for assessing the level of resources for opportunities (based on the Boston Strategy Matrix)



150

BRIC: The BRIC countries are Brazil, Russia, India and China which are all at a similar stage of newly advanced economic development.

CASTLE- Europe INNOVA project for **C**lusters in **A**erospace and **S**atellite **N**avigation **T**echnology **A**pplications **L**inked to **E**ntrepreneurial **I**nnovation, more information on http://archive.europe-innova.eu/index.jsp?type=page&lg=en&classificationId=5025&classificationName=CASTLE&cid=5111

CEBR- COUNCIL OF EUROPEAN BIOREGIONS launched in 2006 through FP6 to network biotechnology clusters across Europe, more information on http://www.cebr.net/

CF - COHESION FUND is aimed at Member States whose Gross National Income (GNI) per inhabitant is less than 90% of the Community average. It serves to reduce their economic and social shortfall, as well as to stabilise their economy. It supports actions in the framework of the

148 http://www.investorwords.com/2633/invisible_hand.html (22.07.2012)
149 More information can be found on www.aseansec.org
150 TACTICS (2011), *Cluster Internationalisation Handbook*, Appendix C

Convergence objective. It is now subject to the same rules of programming, management and monitoring as the ESF and the ERDF.[151]

CIP - COMPETITIVENESS AND INNOVATION PROGRAMME 'is intended as a single coherent legal basis for all Community action relating to competitiveness and innovation in the framework of the Lisbon strategy'. [152] It is planned to run from 2007 to 2013 with an overall budget of € 3.6 billion. It is focussing mainly on the joint development of new and better tools for use by cluster organisations in support of innovative SMEs and involves multi-country innovation networks. For more information: http://ec.europa.eu/cip/

CLOE- CLUSTERS LINKED OVER EUROPE: Informal alliance of clusters all around Europe that are united by a shared commitment to exchange information and to work closely together. CLOE offers an interface to the European economy for interested networks and companies from all over the world. CLOE is also fostering direct co-operation between cluster SMEs operating in the same industry, enhancing their understanding of their sector and helping them to identify future business partners.
Originally, in December 2004, CLOE started as an INTERREG III C project, helping seven regions to exchange experience and information about successfully managing and developing clusters. The City of Karlsruhe's Economic Development Department is still responsible for the CLOE alliance and was the project leader. For more information: http://www.clusterforum.org/

CLUNET: project under PRO INNO aiming to share experiences and implement concrete pilot projects related to cluster innovation and development policies, more information on http://www.proinno-europe.eu/clunet/project-overview

CLUSTER: 'A cluster is a geographical proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and externalities'. (Porter) [153]

CLUSTER INITIATIVE: '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'.[154]

CLUSTER IP: European Innovation Platform for Clusters under Europe INNOVA will foster cooperation between sectoral cluster initiatives. It has two main partnerships (*figure 33)*

CLUSTER ORGANISATION: 'Cluster initiatives are increasingly managed by specialised institutions, known as cluster organisations, which take various forms, ranging from non-profit associations, through public agencies to companies.'[155]

CLUSTER POLICIES are strategic intentions and political objectives in a specific document set up by the government[156]

CLUSTER PROGRAMME is an organized effort taken by government to increase the growth and competitiveness of clusters in its constituency. [157]

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[151] More information on http://ec.europa.eu/regional_policy/thefunds/cohesion/index_en.cfm
[152] More information on http://cordis.europa.eu/fp7/cip_en.html (27.06.2012)
[153] PORTER M. (1998), On Competition, Harvard Business Press, p.215
[154] SOLVELL O & LINDQVIST G & KETELS C.(2003), *The Cluster Initiative Greenbook*, Ivory Tower AB
[155] EUROPEAN COMMISSION (17.10.2008), *Towards world-class clusters in the European Union: Implementing the broad-based innovation strategy*- SEC(2008) 2637, p.8
[156] SÖLVELL Ö. (2008), *Clusters- Balancing Evolutionary and Constructive Forces*, Ivory Tower Publishing, Sweden, ISBN: 978-9197478335 - The cluster life cycle, p.50
[157] EUROPEAN CLUSTER POLICY GROUP (2010), *Final recommendations- A call for Policy Action*, http://www.proinno-europe.eu/ecpg/newsroom/ecpg-final-recommendations

CLUSTER THEORY focuses on 'how juxtaposition of economically linked firms and institutions in a specific geographic location affects competitiveness.'[158] (Porter, 2008)

COHESION POLICY: The necessary investment framework to deliver the Europe 2020 objectives is provided by the Cohesion Policy which includes the ERDF, ESF and CF. Since the 1980's public authorities used cohesion policy instruments to develop innovation strategies. As part of the 'towards world-class clusters' approximately €86 billion of the Cohesion Policy Fund of the current period (2007-2013) have been allocated to research and innovation. The next programme period (2014-2020) of the EU cohesion policy mainly will be based on linking allocation of fund to the Europe 2020 objectives.

COMPETITIVENESS refers to the overall economic performance of a nation measured in terms of its ability to provide its citizens with growing living standards on a sustainable basis and broad access to jobs for those willing to work. In short competitiveness refers to the institutional and policy arrangements that create the conditions under which productivity can grow sustainably.[159]

CREATIVE INDUSTRIES are 'those industries that have their origin in individual creativity, skill and talent and that have a potential for wealth and job creation through the generation and exploitation of intellectual property. (DCMS, 1998, 2001)[160] Examples are related to the Music and film industry, Architecture, Photographic activities and all arts and entertainment activities.

DG ENTERPRISE & INDUSTRY: has a key role to play in the implementation of Europe 2020. It is responsible for the two of the seven flagship initiatives concerning clusters. More information on http://ec.europa.eu/enterprise/dg/index_en.htm

EC- EUROPEAN COMMISSION: More information on http://ec.europa.eu/index_en.htm

ECA- EUROPEAN CLUSTER ALLIANCE is an open platform for better policy cooperation created in 2006. It brings together national and regional authorities and innovation agencies active in the fields of clusters to develop better cluster policies in the EU. In total it is representing several national and regional authorities, development and innovation agencies and it is supported by the European Cluster Memorandum. Since January 2008 it is also open to external cluster-relevant organisations in Europe. For more information: http://www.proinno-europe.eu/eca

ECCP - EUROPEAN CLUSTER COLLABORATION PLATFORM: The European Cluster Excellence initiative provides at its core access to the European Cluster Collaboration Platform. This platform free of charge enables more targeted interaction between cluster organisations and their members. The ECCP provides the mapping and profiling of cluster organisations and cluster members as well as establishing sectoral and thematic communities. So its useful especially to search for new project ideas and financing sources as well as setting up future collaboration with new partners. For more information: http://www.cluster-collaboration.eu

ECEI - EUROPEAN CLUSTER EXCELLENCE INITIATIVE brings together the most experienced persons and organisations in Europe in order to promote the excellence of cluster management by developing quality indicators and peer assessment procedures. It helps cluster organisations and cluster managers with professional trainings to raise the quality of cluster management in the EU. The Cluster Management Quality Label is an independent prove of cluster management excellence accepted and recognised all over Europe. For more information: http://www.cluster-excellence.eu/3552.html

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[158] PORTER M. (2008), *On Competition*, Harvard Business Review Book, USA, p.242

[159] EUROPEAN COMMISSION (2010), *European Competitiveness Report 2010*, Office for Official Publications of the European Communities, ISBN: 978-9279176203 p.23

[160] EUROPEAN COMMISSION (2010), *European Competitiveness Report 2010*, Office for Official Publications of the European Communities, ISBN: 978-9279176203 p. 163

ECO - EUROPEAN CLUSTER OBSERVATORY was launched in 2007 under the Europe INNOVA initiative and provides neutral and comparable statistical information on cluster policies and relative cluster strengths in the EU. The online platform is targeting three main groups: policy makers and government officials, cluster management staff and academics and researchers. For more information: http://www.clusterobservatory.eu/

ECOCLUP: living network offering one-stop solutions to support innovation and internationalisation of eco-innovative companies (*Figure 73)*

ECO-IP: Under Europe INNOVA it accelerates eco-innovative solutions in Europe by several sectoral partnerships. (*Figure 31*)

ECPG - EUROPEAN CLUSTER POLICY GROUP: Pro INNO established in 2008 the European Cluster Policy Group to help member states develop a more strategic vision to reach critical mass and world-class excellence. It has been composed of 20 independent high-level experts established for the term of 18 months to advise the European Commission and Member States on how to better support the development of world-class clusters. For more information: http://www.proinno-europe.eu/ecpg/project-overview

EEN- ENTERPRISE EUROPE NETWORK 'helps small business to make the most of the European marketplace. ' They help develop your business in new markets, source or license new technologies and access EU finance and EU funding. They have close to 600 member organizations across the EU and beyond. They include chambers of commerce and industry, technology centers, universities and development agencies. [161] For more information: http://portal.enterprise-europe-network.ec.europa.eu/

EGTC: EUROPEAN GROUPING OF TERRITORIAL COOPERATION: was formed to overcome the obstacles hindering cross-border cooperation and constitutes a legal entity

EMERGING INDUSTRIES can be grouped in three categories. They are industries which apply existing knowledge in new ways to existing needs, they apply existing knowledge to new needs or they apply new knowledge to existing or new needs. [162]

ENCADRE- European Network of Clusters for Satellite Applications Development.(*Figure 77)* More information on http://www.encadre.net/

EPO – EUROPEAN PATENT OFFICE: More information on http://www.epo.org/

ERA- EUROPEAN RESEARCH AREA: project designed to improve our lives by making Europe a place where scientific research, technological development and innovation thrive and address the major challenges of our times. More information on http://ec.europa.eu/research/era/index_en.htm

ERAWATCH provides information on European, national and regional research systems, policies, and programmes in the EU and beyond. For more information: http://erawatch.jrc.ec.europa.eu/

ERDF- EUROPEAN REGIONAL DEVELOPMENT FUND aims to strengthen economic and social cohesion in the European Union by correcting imbalances between its regions. More information on http://ec.europa.eu/regional_policy/thefunds/regional/index_en.cfm

[161] Enterprise Europe Network http://portal.enterprise-europe-network.ec.europa.eu/ (20.05.2012)

[162] EUROPEAN CLUSTER POLICY GROUP (2010), *Consolidated Set of Policy Recommendations on Four Themes*, http://www.proinno-europe.eu/ecpg/newsroom/ecpg-final-recommendations p. 6

ESCA- EUROPEAN SECRETARIAT FOR CLUSTER ANALYSIS: was established by one of the leading German innovation agencies VDI/VDE Innovation and Technik GmbH to offer practical advice to cluster management organizations. More information on http://www.cluster-analysis.org/

ESF- EUROPEAN SOCIAL FUND sets out to improve employment and job opportunities in the European Union. http://ec.europa.eu/regional_policy/thefunds/social/index_en.cfm

EU- EUROPEAN UNION: More information on http://europa.eu/index_en.htm

EUROPE 2020 STRATEGY: (2010- 2020) is a 'new strategy for the EU to develop as a smarter, knowledge based, greener economy, delivering high levels of employment, productivity and social cohesion'[163]

EUROPEAN CLUB OF CLUSTER MANAGERS - The Cluster-Excellence initiative established a 'European Club of Cluster managers'. It is an association of individuals for European cluster managers and practitioners, who can share on a platform problems, information and experiences to tackle new challenges. In this framework a European Cluster Manager is awarded each year for his performances. For more information: http://www.cluster-excellence.eu/club.html

EUROPEAN CLUSTER MEMORANDUM: More information in THE HIGH LEVEL ADVISORY GROUP ON CLUSTERS, *The European Cluster Memorandum- Promoting European Innovation through Clusters: An Agenda for Policy Action*

EUROPE INNOVA is an initiative of the European Commission- Directorate General for Enterprise and Industry and was founded in 2006 under the Competitiveness and Innovation Programme (CIP) to support all forms of innovation. As such it is the man pan-European platform for innovation with a focus on the joint development of new and better tools for use by cluster organisations in support of innovative SME's. For more information: www.europainnova.org[164]

EUROSTAT: European statistical institution, more information on http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/

FDI - FOREIGN DIRECT INVESTMENT, 'a component of a country's national financial accounts. Foreign direct investment is investment of foreign assets into domestic structures, equipment, and organizations. It does not include foreign investment into the stock markets. Foreign direct investment is thought to be more useful to a country than investments in the equity of its companies because equity investments are potentially "hot money" which can leave at the first sign of trouble, whereas FDI is durable and generally useful whether things go well or badly'[165]

FINE- FOOD INNOVATIONS NETWORK EUROPE which united eight different regions with agro-food clusters and developed strategies to bring in more investment in research and technological development. [166]

FP7- 7TH FRAMEWORK PROGRAM: bundles all research-related EU initiatives together under a common roof playing a crucial role in reaching the goals of growth, competitiveness and employment. For more information: http://cordis.europa.eu/fp7/understand_en.html

GDP- GROSS DOMESTIC PRODUCT: The total market value of all final goods and services produced in a country in a given year, equal to total consumer, investment and government spending, plus the value of exports, minus the value of imports.[167]

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[163] EUROSTAT: Europe 2020 (06.08.2011) http://epp.eurostat.ec.europa.eu/portal/page/portal/europe_2020_indicators/headline_indicators

[164] DIRECTORATE-GENERAL FOR ENTREPRISE AND INDUSTRY (2007), *Innovation clusters in Europe: A statistical analysis and overview of current policy support*, Luxembourg, ISBN: 978-9279072895

[165] http://economics.about.com/cs/economicsglossary/g/fdi.htm (15.07.2012)

[166] http://zakonczone.ppnt.poznan.pl/networkfine/ (22.07.2012)

GLOBAL CLUSTER OBSERVATORY: is an access point to cluster observatories and other leading cluster resources throughout the world. More information on http://www.clusterobservatory.org/

HOUSING BUBBLE- huge inflation of house prices during the last financial crisis

IMPROVE: stands for improving innovation management performance with sustainable impact under Europe INNOVA. More information can be found on https://www.improve-innovation.eu/

INTERCLUSTER Association of clusters within a specific interregional or transnational area and engaged in processes aimed at common strategic development. The objective is to promote synergies around high-value-added products and services, and thereby contribute to the emergence of European industrial projects.[168]

INTERREG IVC provides funding for cooperation across Europe. It is implemented under the European Community's territorial co-operation objective and financed through the European Regional Development Fund (ERDF). The Programme was approved in September 2007 and the period for INTERREG IVC will last from 2007-2013. This programme follows on from the INTERREG IIIC programme which ran from 2002-2006. For more information: http://www.interreg4c.eu/about_programme.html

KETs- KEY ENABLING TECHNOLOGIES: KETs are knowledge-intensive and associated with high R&D intensity, rapid innovation cycles, high capital expenditure and highly skilled employment. They enable process, goods and service innovation throughout the economy and are of systemic relevance. They are multidisciplinary, cutting across many technology areas with a trend towards convergence and integration. KETs can assist technology leaders in other fields to capitalise on their research efforts. [169] Some examples are ICT, Microsystems, advanced and smart materials, nanotechnologies and biotechnologies.

KIS- IP- KNOWLEDGE INTENSIVE SERVICES PLATFORM: European initiative funded under Europe INNOVA, with the aim to accelerate the take-up of services innovations in Europe. The initiative focuses on the development and testing of new or better innovation support mechanisms for innovative small and medium sized enterprises (SMEs), in particular in technological and industrial fields. More information under http://www.europe-innova.eu/web/guest/innovation-in-services/kis-innovation-platform/about

LISBON STRATEGY: set out in 2000 by the European Council. It is an action and development plan to make Europe more dynamic. Based on Schumpeter's[170] idea that innovation is the motor for economic change it should further deal with the stagnation of economic growth and the low productivity in the EU. The Lisbon strategy was set up for the period 2000 to 2010 and should aim to 'make Europe, by 2010, the most competitive and the most dynamic knowledge-based economy in the world'[171] (EC, 2005).

NACE CODES: official grouping of sectors, List on http://ec.europa.eu/competition/mergers/cases/index/nace_all.html

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[167] http://www.investorwords.com/2153/GDP.html (22.07.2012)

[168] Intercluster http://www.intercluster.eu/index.php?option=com_content&view=article&id=13&Itemid=2&lang=en (18.05.2012)

[169] EUROPEAN COMMISSION (2010), *European Competitiveness Report 2010*, Office for Official Publications of the European Communities, ISBN: 978-9279176203 p. 132

[170] SCHUMPETER J. (1934), The theory of economic development, Cambridge, Massachusetts: Harvard University Press

[171] SAMARDZIJA V. & BUTKOVIC H. (2010), From the Lisbon strategy to Europe 2020, Institute for International Relations, Zagreb, ISBN: 978-9536096534

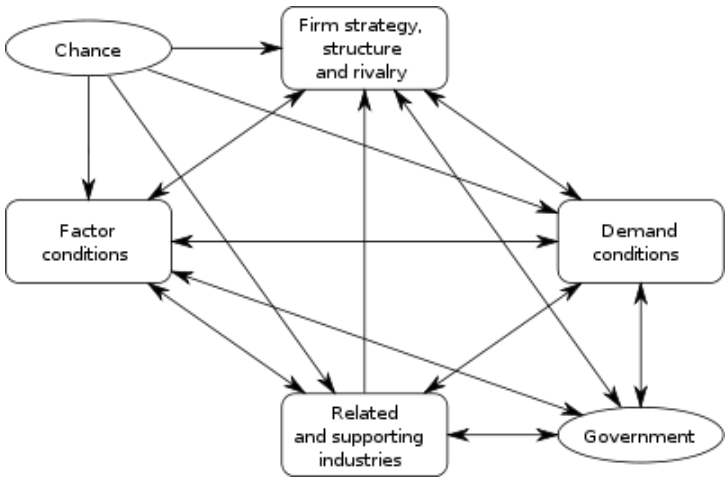
NUTS CODES: geographical boundaries, List on http://www.etisys.com/uploads/media/NUTS-Codes.pdf

OECD – ORGANISATION FOR ECONOMIC COOPERATION AND DEVELOPMENT: The mission of the OECD is to promote policies that will improve the economic and social well-being of people around the world. More information on http://www.oecd.org/

OSEO is a public-sector institution dedicated to economic development and a key source of financing and other support for SMEs. For more information: http://www.oseo.fr/qui_sommes_nous

PRO INNO EUROPE: the innovation policy initiative PRO INNO Europe combines analysis and benchmarking of national and regional innovation policy performance with support for cooperation of national and regional innovation programs and incentives for innovation agencies and other innovation stakeholders to implement joint actions. The initiative aspires to become the main European reference for innovation policy analysis and development throughout Europe and brings together over 200 innovation policy makers and stakeholders from 33 countries.[172] For more information: www.proinno-europe.eu

PORTER'S DIAMOND is used to assess the competitive advantage of a nation and by implication their industries



- Factor conditions are production factors such as skilled labour, logistics or infrastructure
- Demand conditions are the extent and nature of demand within the nation
- Related industries are the competitive strength of other industries in the nation concerned that support the industry in question
- Firm strategy, structure and rivalry are the conditions in the market which create barriers to companies and enable competition.

R&D- RESEARCH AND DEVELOPMENT

R&D INTENSITY: share of R&D expenditures in value added

REGIONS FOR ECONOMIC CHANGE initiative financed under INTERREG IVC (cohesion policy) and URBACT for the period 2007-2013 improves dynamism in regional and urban networks.

[172] DIRECTORATE-GENERAL FOR ENTREPRISE AND INDUSTRY (2007), *Innovation clusters in Europe: A statistical analysis and overview of current policy support*, Luxembourg, ISBN: 978-9279072895

REGIONS OF KNOWLEDGE: financed under FP7 in close cooperation with CIP is part of the European Research Area (ERA) policy and aims at strengthening the research potential of European regions through encouraging the development and networking of research-driven clusters.

SECTORAL INNOVATION WATCH under Europe INNOVA gives detailed insights into sectoral innovation performance

SME- Small and medium sized enterprises

SWOT ANALYSIS- acronym for Strengths, Weaknesses, Opportunities and Threats. By definition, Strengths (S) and Weaknesses (W) are considered to be internal factors over which you have some measure of control. Also, by definition, Opportunities (O) and Threats (T) are considered to be external factors over which you have essentially no control.[173]

TACTICS coordinated by OSEO, aims at supporting and further expanding the ECA and contributing to the development of better cluster policies and practical tools in Europe

TAKE IT UP s the promotion pillar of Europe INNOVA aimed at enhancing, disseminating and facilitating the uptake of the outputs developed by Europe INNOVA partnerships. More information on http://www.europe-innova.eu/web/guest/novel-tools-services/take-it-up/about

TCAS: Project of Europe INNOVA to '**T**ransnational **C**lustering in the **A**utomotive **S**ector', more information on http://archive.europe-innova.eu/index.jsp?type=page&lg=en&from=child&classificationId=5028&classificationName=TCAS&cid=5114&parentClassificationId=4961&parentClassificationName=Cluster%20Networks&parentContentId=5104

THE DECISION GROUP: More information on http://www.thedecisiongroup.nl/

TRIPLE HELIX - government, academia and business governing together

URBACT is a European exchange and learning programme promoting sustainable urban development, more information on http://urbact.eu/

WORLD-CLASS CLUSTER is an imprecise concept which can be understood as an ideal to strive towards and dynamics to set in motion which is within the reach of every single cluster as long as they play a part in the appropriate strategy. World class clusters are interclusters, so clusters of clusters reaching a level one single cluster would never be able to reach alone. The White paper[174] suggests 15 criteria regrouped into three main categories defining World-class clusters:

- Criteria for cluster framework conditions: Quality of cluster sector relevant R&D, Quality of the education in relevant fields, Dynamics of creating new and innovative companies in the region, Attractiveness of the region for high potentials and world-class researchers as well as for foreign investments, Existence of innovation stimulating regulation and public sector demand
- Criteria for cluster actors: Critical mass of market and technology leaders developing or manufacturing high tech products, components, applications or providing innovative services, International visibility and reputation of the cluster and its actors, Commitment and active

[173] http://managementstudyguide.com/swot-analysis.htm (05.05.2012)

[174] EUROPA INTERCLUSTER (2010), *White Paper- The Emerging of European world-class clusters*, http://www.intercluster.eu/index.php?option=com_flexicontent&view=items&cid=1:frontpage&id=159:release-of-the-white-paper-on-the-emerging-of-world-class-clusters&Itemid=1

involvement of key actors in the cluster work, Involvement of competitors, Involvement of cluster actors in international co-operations and linkages to key actors outside the cluster

- Criteria for cluster organisation: Cluster strategy and its implementation, Professionalization of cluster management services, Sustainability of financing and appropriate staffing of the cluster organisation, Coherence between educational actors, R&D institutions and cluster actors, Added value

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