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PROVEN FOR CLUSTER EXCELLENCE

Cluster organisations in Europe – insights from Bronze and Gold Label assessments

Input paper for the workshop "Moving forward the EU policy agenda on cluster excellence", Brussels, September 23rd, 2014

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ESCA is the European Secretariat for Cluster Analysis. Based in Berlin and hosted by VDI/VDE Innovation + Technik GmbH, ESCA supports in particular cluster managers and policy makers with advice on cluster development. ESCA experts have developed a methodology for cluster benchmarking that is acknowledged by both cluster managers and policy makers throughout Europe. Since 2008 more than 700 cluster management organisations have been benchmarked according to this methodology. Being involved in the European Clusters Excellence Initiative (ECEI) from 2009 to 2012, ESCA experts contributed to the development of tools that support cluster managers on their way to excellence.

Berlin, September 2014

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1   Introduction

Roughly two years after the completion of the European Cluster Excellence Initiative (ECEI) and its continuation through the European Secretariat for Cluster Analysis (ESCA) and the European Foundation for Cluster Excellence it is time to presents insights from both cluster labelling and cluster excellence training to a broader public.

This paper is presented at the occasion of a workshop organised by the European Commission, DG Enterprise, to be held on September 23rd, 2014 in Brussels, to inform discussions on the EU policy agenda on cluster excellence. The paper concentrates on insights that have been gathered by the European Secretariat for Cluster Analysis through several hundreds of cluster benchmarkings and management audits.

The paper has to be understood as a workshop report and not as a scientific in-depth analysis to prepare the grounds for policy recommendations. The aim of the paper is to inform interested stakeholders about findings from cluster benchmarking and management audits to facilitate further discussions that may result in policy recommendations.

The paper is structured in three sections:

- An introduction to the European Secretariat of Cluster Analysis and its structures. This section includes also a brief introduction the different Labels of Cluster Management Excellence that are awarded to cluster organisations.

- Insights from cluster benchmarking and quality labelling including reflections on weaknesses in cluster management, strategies and services of cluster organisations. This includes also examples of best practice which may inspire other cluster organisations to revisit their strategy and service portfolio.

- Conclusions that are based on experiences made by ESCA with the implementation of the labelling scheme. They may be helpful for any activities by the European Commission or Member State governments for the use of the labelling scheme in the future.

2 A brief introduction to the European Secretariat for Cluster Analysis (ESCA) and the Labels of the European Cluster Excellence Initiative (ECEI)

2.1 A few facts about the European Secretariat for Cluster Analysis (ESCA)

As part of the EU efforts to create more world-class clusters across the EU by strengthening cluster excellence, the Commission launched in 2009, under the Competitiveness and Innovation Programme, the **European Cluster Excellence Initiative (ECEI)**. After successful completion of the initiative's work ECEI partners - including 13 organisations from nine European countries all involved in cluster development and management - decided to continue activities. In order to implement the quality labelling scheme for cluster organisations developed by ECEI the **European Secretariat for Cluster Analysis (ESCA)** was established to act as a one-stop shop for cluster organisations that are interested in a quality assessment of their management structures and activities.

Today, ESCA, hosted by VDI/VDE Innovation + Technik GmbH in Berlin, is at the head of a pan-European network of nearly 100 experts from 26 countries. Together these experts have yet analysed more than 600 cluster organisations from 35 countries. Subject to the participation in training on the ESCA methodology the network is open to everybody working in the area of cluster management excellence.

For further reading on the **European Cluster Excellence Initiative (ECEI)** please visit **www.cluster-excellence.eu** and for the **European Secretariat for Cluster Analysis ESCA www.cluster-analysis.org**. A list of **ESCA experts** can be accessed at **www.cluster-analysis.org/esca-experts**.

2.2 Labels of the European Cluster Excellence Initiative (ECEI)

The quality label scheme of the ECEI covers three different levels: Bronze, Silver and Gold. Each label corresponds to a specific assessment scheme.

2.2.1 Bronze Label of Cluster Management Excellence

Cluster management organizations that benchmark themselves with peers in order to learn from best practice demonstrate their interest in striving for excellence. For being benchmarked under the ESCA benchmarking approach by one of the ESCA experts cluster management organizations are awarded with the Bronze Label of the European Cluster Excellence Initiative to acknowledge this interest.

In contrast to evaluations and economic impact assessments benchmarking is an efficient and effective way to identify the potential of a cluster and to develop strategic recommendations for its further development within a short time frame. Benchmarking is a comparative analysis of structures, processes, products and services. It compares an entity to peers in the same field of activity and/or to best practices from entities in other areas. The objective of benchmarking is to learn from better performing peers or other entities in order to improve own structures, processes, products and services.

The Bronze Label is not a quality label as the benchmarking results only provide orientation in terms of the developmental status of the cluster organisation. However, it is the first step towards improving quality of cluster management.

ESCA cluster benchmarking is based on a personal interview of about two hours duration with the manager of a cluster organization. The interview is conducted by an impartial ESCA benchmarking expert. By focussing on 36 indicators the interview captures data on different dimensions of the cluster and the cluster organization, including the structure of the cluster, the cluster management and the governance structures of the cluster, financing of the cluster organization, services provided by the cluster organization, communication within the cluster and achievements and recognition of the cluster and the cluster organization. The analysis is presented in a comprehensive benchmarking report (ca. 70 pages). The report includes graphical comparison of the cluster with clusters from the same technological area and the most excellent ones in Europe. The report also includes recommendations for improvement.

Since its official inception on the European level in October 2010 621 cluster organisations from 35 countries have participated in the cluster benchmarking and have been awarded with the Bronze Label of Cluster Management Excellence.

For an overview of the cluster organisations that have been awarded with the Bronze Label please see **www.cluster-analysis.org/benchmarked-clusters**.

2.2.2   Silver Label of Cluster Management Excellence

The Silver Label of Cluster Management Excellence is available to cluster organisations that have participated in a second cluster benchmarking after 1.5 to 2 years of the first benchmarking. The idea of the Silver Label, which goes a step further than the Bronze Label, is to have an actual quality label available that confirms improvements of management structures that develop from insights gained through the Bronze Label benchmarking exercise. Organisations that are able to demonstrate improvements will be awarded with the Silver Label of the European Cluster Excellence Initiative (ECEI).

The process of the quality audit consists of four steps:

1. Cluster organisation is subjected to a second benchmarking.
2. Upon receipt of the benchmarking report the cluster management organisation is requested to indicate at least three areas in which improvements from the management's point of view have been achieved. The indication has to be submitted in writing to ESCA.
3. ESCA reviews the submitted information.
4. An assessor will visit the cluster management organisation to validate the indicated areas of improvement. The criteria of the Gold Label of the European Cluster Excellence Initiative relevant to the identified areas of improvement will be used as a validation benchmark.

The Silver Label was introduced in summer 2014 and is still in its pilot phase. Yet two cluster organisations have been awarded with the Silver Label. For an overview please see **www.cluster-analysis.org/silver-label-of-the-european-cluster-excellence-initiative-ecei**.

2.2.3   Gold Label of Cluster Management Excellence

The "Cluster Management Excellence Label GOLD - Proven for Cluster Excellence" of the European Cluster Excellence Initiative acknowledges cluster organisations that demonstrate highly sophisticated cluster management and that are committed to further improve their organisational structures and routines for the benefit of an even higher performance.

In order to qualify for the "Cluster Management Excellence Label GOLD" cluster management organisations need to meet certain "levels of excellence" in terms of structure of the cluster,

governance, financing, strategy and services and recognition. In the course of a thorough two-day assessment conducted by two neutral cluster analysis experts 31 indicators are assessed (Table 1).[1]

Assessment results will be presented to the Cluster Excellence Expert Group (CEEG) for a final decision whether a cluster organisation will be awarded with the Gold Label of the European Cluster Excellence Initiative. The CEEG acts as an international board ensuring neutrality and international recognition of any awarded labels. Cluster organisations that have been awarded are invited to nominate a member of the CEEG.

Dimension	Indicator	
Structure of the cluster	1.1.0	Committed cluster participation
	1.1.1	Composition of the cluster participants
	1.1.2	Number of committed cluster participants in total
	1.2	Geographical concentration of the cluster participants
Typology, governance, cooperation	2.1	Maturity of the cluster management
	2.2.1	Human Resources available for cluster management
	2.2.2	Qualification of the cluster management team
	2.2.3	Life-long learning aspects for the cluster management team
	2.2.4	Stability and continuity of human resources of the cluster management team
	2.3	Stability of cluster participation
	2.4	Clarity of roles – involvement of stakeholders in decision making processes
	2.5	Direct personal contacts between the cluster organisation management team and the cluster participants
	2.6	Degree of cooperation within the cluster
	2.7	Degree of integration of the cluster organisation in the innovation system
Financing	3.1	Prospects of the financial resources of the cluster organisation
	3.2	Share of financial resources from private sources
Strategy, objectives, services	4.1.1	Strategy building process
	4.1.2	Documentation of the cluster strategy
	4.1.3	Implementation plan
	4.1.4	Financial controlling system
	4.1.5	Review of cluster strategy and implementation plan
	4.1.6	Performance monitoring of cluster management
	4.2	Focus of cluster strategy
	4.3	Activities and services of the cluster management
	4.4	Achievements of cluster management
	4.5	Working groups
	4.6.1	Communication of the cluster organisation
	4.6.2	Cluster organisation's web presence
Achievements, recognition	5.1	Recognition of the cluster in publications, press, media
	5.2	Success stories
	5.3	Customer and cluster participants' satisfaction assessment

Table 1: Quality indicators

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[1] A detailed description of the quality indicators and the process can be downloaded at **www.cluster-analysis.org/downloads/130226_PublicDocumentforGOLDAssessmentpreparation.pdf**.

Until today 45 cluster organisations from 9 countries have participated in the cluster benchmarking and have been awarded with the Gold Label of Cluster Management Excellence. For an overview of the cluster organisations that have been awarded with the Gold Label please see **www.cluster-analysis.org/gold-label-new**.

2.3   Pan-European network I: open network of experts

Benchmarking and quality audits of cluster organisations are carried out by a network of more than 100 experts from 26 countries. Each expert participated in a special training and can conduct assessments at any time and on own initiative which gives him the flexibility to support cluster organisations in his region through advice in the moment it is required. The network is open and interested experts are invited to join it.

A full list of ESCA can be accessed at **www.cluster-analysis.org/esca-experts**.

2.4   Pan-European network II: governance structures of ESCA

ESCA considers itself as a pan-European network. Consequently decisions on the label award and the further development of the labelling scheme will not be taken by its headquarters, but as a joint effort of partners. In this respect monitoring and decision-making bodies including the "Technical Advisory Board Cluster Management Excellence" and the "Cluster Excellence Expert Group" were set up.

Figure 1: ESCA governance structure

The **Technical Advisory Board Cluster Management Excellence (TAB)** consists of representatives of the partners in the European Cluster Excellence Initiative. The TAB is responsible for monitoring and further developing the standards of the "Cluster Management Excellence Label Gold" assessment methodology and indictors.

The TAB is currently chaired by Simone Hagenauer of ecoplus. Niederösterreichs Wirtschaftsförderungsagentur GmbH and, as vice-chairwoman, Emma Vendrell of ACCIO - Catalan Agency for Business Competitiveness.

The **Cluster Excellence Expert Group (CEEG)** is a group of cluster managers that have been awarded with the Gold Label of Cluster Management Excellence. The group takes the final decision on whether a Gold Label is awarded to a cluster organisation and supervises ESCA in terms of the execution of the assessment process according to the process standards defined by the European Cluster Excellence Initiative.

The CEEG is chaired by Daniel Gottschald (Managing Director of Chemicals Cluster Bavaria) and Alberto Cominges (Managing Director of CEAGA - Cluster de Empresas de Automoción de Galicia).

In addition to this decision making structure the **High-Level Policy Group** was initiated as a platform for policy makers from regional and national governments and the European Commission to exchange best practice that developed from the implementation of the labelling scheme in cluster programmes. The group met for the first time in May 2014 bringing together representatives of ministries and government agencies from Austria, Denmark, Germany, Norway, Spain and Sweden as well as from the European Commission.

2.5 The labelling scheme as an element of cluster programmes

The labelling scheme is used by different cluster programmes throughout Europe to support cluster organisations in their efforts to develop good management practice. This includes for example:

- **Denmark:** Cluster organisations that are supported under the Innovation Network Programme are encouraged to subject themselves to a Gold Label audit. In its national cluster policy Denmark even set targets in terms of numbers of organisations that are successfully labelled.

- **Germany:** The Federal Ministry of Economic Affairs and Energy expects cluster organisation that participate in the go-cluster programme to participate at least in the Bronze label benchmarking. Interested cluster organisations are invited to subject themselves to a Silver Label quality audit. On the federal level, the State Government of Baden-Württemberg, has made the Gold Label assessment an integral element of its regional cluster policy.
- **Norway:** It is a condition that all new projects supported under the Arena and Norwegian Centre of Expertise programmes level carry out benchmarking pursuant to the *Bronze Label* criteria during the first two years. For cluster organisations that receive funding under the Global Centres of Expertise programme it is a condition to be certified pursuant to the *Gold Label* criteria during the first two years. Projects must have qualified for a Gold Label in order to receive funding after two years.

3 Insights from cluster benchmarking and quality labelling

The analysis of several hundred cluster organisations has resulted in various interesting insights into the nature of clusters and their management organisations. The following chapters present an overview of weak areas of cluster management that have been identified – this is not to say that there are no strengths, but learning from weaknesses is always more interesting – as well as a more detailed discussion of strategies and services of cluster organisations.

3.1 Overview of assessments

As of September 9th, 2014, 621 cluster organisations from 35 countries including most of EU Member States and European countries with close ties to the EU such as Serbia, Switzerland and Turkey. But also cluster organisations from overseas countries such as Canada, Columbia, India, Lebanon, Morocco, Mexico and Tunisia participated. The analysis does not include cluster organisations from the EU Member States of Cyprus, Lithuania, Luxembourg, Malta and Slovenia as in these countries no benchmarking exercises have been implemented yet.

Table 2 gives an overview of countries by numbers of cluster organisations and industries respectively technology areas that have been covered yet.

TECHNOLOGY AREAS		Aviation and space	Biotechnology	Construction/building sector	Creative industries and business, media, design	Energy and environment	Food industry (non-biotech)	Health and medical science	Humanities / social sciences, service innovation	Information and communication	Micro, nano and optical technologies	New Materials and chemistry	Production and engineering	Sports / Leisure / Tourism	Transportation and mobility	Total
	AUT	0	1	1	0	2	0	0	0	1	0	1	2	0	1	**9**
	BEL	1	0	3	1	1	2	2	0	2	1	2	1	0	1	**17**
	BGR	0	0	0	0	0	0	0	0	0	1	0	4	0	1	**6**
	CAN	0	0	0	0	1	0	0	0	0	0	0	0	0	1	**2**
	CHE	0	0	1	0	0	0	0	0	0	1	0	1	0	0	**3**
	COL	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**1**
COUNTRIES	**CZE**	0	0	0	0	3	0	1	0	2	1	2	3	0	1	**13**
	DNK	0	1	1	6	10	3	5	4	4	0	2	6	0	3	**45**
	ESP	0	1	3	5	10	9	3	1	11	1	2	11	2	7	**66**
	EST	0	0	0	0	0	0	0	0	1	0	0	0	0	0	**1**
	FIN	0	0	0	1	3	2	0	0	1	1	2	0	1	0	**11**
	FRA	4	1	1	6	15	9	6	4	5	5	10	6	7	5	**84**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
GBR	0	0	0	2	0	0	0	0	0	0	0	1	0	0	**3**
GER	3	11	2	7	16	5	8	1	12	22	7	18	0	12	**124**
GRC	1	0	0	1	0	0	0	0	0	1	0	1	0	0	**4**
HRV	0	0	0	0	0	3	0	0	2	0	0	7	1	1	**14**
HUN	0	2	1	0	2	0	1	0	6	0	0	4	0	1	**17**
IND	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**1**
IRL	0	0	0	1	2	1	0	0	1	0	0	0	2	0	**7**
ISL	0	0	0	0	3	1	0	1	1	0	0	1	3	0	**10**
ITA	1	0	2	0	5	3	2	0	1	0	3	1	2	1	**21**
LBN	0	0	0	1	0	0	0	0	1	0	0	0	0	0	**2**
LVA	0	0	0	0	0	0	0	0	1	0	0	0	0	1	**2**
MAR	0	0	1	0	2	1	0	0	1	1	0	2	0	0	**8**
MEX	1	0	0	0	0	0	0	0	10	0	0	1	0	1	**13**
NLD	0	0	0	0	0	1	0	0	0	0	0	0	1	0	**2**
NOR	0	2	0	3	5	2	2	0	2	2	1	6	4	1	**30**
POL	2	0	3	5	5	0	2	1	7	1	1	3	1	1	**32**
PRT	0	0	1	1	1	3	1	0	1	0	0	5	1	1	**15**
ROU	0	0	0	0	2	0	0	0	1	1	0	2	0	0	**6**
SRB	0	0	0	0	0	0	0	0	2	0	0	2	0	0	**4**
SVK	0	0	0	0	1	0	0	0	1	0	1	2	2	1	**8**
SWE	0	2	0	2	2	2	1	1	4	1	0	1	0	0	**16**
TUN	0	0	0	0	1	0	0	0	0	0	0	1	0	0	**2**
TUR	2	0	0	0	0	3	1	0	0	0	2	14	0	0	**22**
Total	**15**	**21**	**20**	**42**	**93**	**50**	**35**	**13**	**81**	**40**	**36**	**107**	**27**	**41**	**621**

Table 2: Total number of clusters per country and industry respectively/technology area that have been benchmarked since October 2010

3.2 Weak areas related to the management of cluster organisations

This chapter presents key findings in terms of weakness of cluster organisations that participated in a cluster benchmarking (Bronze Label of the European Cluster Excellence Initiative) or a management audit (Gold Label of the European Cluster Excellence Initiative).

3.2.1 Bronze Label: Weak areas of cluster organisations

Since October 2011 more than 600 cluster organisations from 35 European and overseas countries have been benchmarked according to the ESCA methodology. The following analysis comprises only the organisations that are based in one of the EU Member States or Iceland and Norway. For the purpose of the analysis different country groups were examined in order to identify possible patterns

that may depend on the performance of national economies. Box 1 describes the portfolios of the country groups that were used for the analysis.

Comparison: portfolios of country groups

- **Group A:** Most EU States plus Iceland and Norway. This group does not include Cyprus, Lithuania, Luxembourg, Malta and Slovenia as in these countries no benchmarking exercises have been implemented yet. This group includes a dataset comprising 555 cluster organisations.
- **Group B:** EU Member States from Central and Eastern Europe, including Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Poland, Slovakia and Romania. This group includes a dataset comprising 99 cluster organisations.
- **Group C:** EU Member States featuring a "strong economy" including Austria, Belgium, Denmark, Finland, Germany, France, Ireland, Netherlands, Sweden and the United Kingdom. This group also includes Iceland and Norway. This group includes a dataset comprising 358 cluster organisations.
- **Group D:** EU Member States from Southern Europe that have been seriously struggling in economic terms in recent years. This group includes a dataset comprising 98 cluster organisations.

Box 1: Comparison: portfolios of country groups

The general picture in terms of **weaknesses** that is **common to all European cluster organisations (Group A)** is presented in **Figure 2** – with "green" indicating a level of excellency according to the excellence criteria of the Gold Label of the European Cluster Excellence Initiative, while "yellow" indicates a satisfactory level with room for improvement and "red" serious weaknesses in terms of the excellence criteria.[2]

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[2] For a description of the indicators please see **www.cluster-analysis.org/downloads/130226_PublicDocumentforGOLDAssessmentpreparation.pdf**.

Figure 2: Weaknesses of cluster organisations – Group A: EU 28 plus Norway and Iceland

Key findings for group A in terms of the most prominent "yellow" and "red" weaknesses are:

1. 57 percent of European cluster organisations have a **critical relationship between committed and non-committed cluster participants**. Committed participation of companies and research actors is a key requirement for the successful development and implementation of cluster projects. Only if companies and research actors commit themselves by contributing financial means (e. g. membership fees) and/or by participating actively on a regular basis in cluster activities such as projects or matchmaking events a cluster organisation can realise the strategic objectives of the cluster. Non-committed cluster participants are often mere followers of a cluster activities looking for access to advantages without costs.

2. **Clusters should have the right balance between companies, universities, research institutions, service providers and government agencies ("composition of the cluster participants").** 53 percent of the cluster organisations in Europe face challenges in this regard, either because the share of companies is too small compared to the number of research actors or they lack research actors at all.

3. 77 percent of the cluster organisations do not pay enough attention to **further education and training of their staff** (life-long learning). As industries are constantly developing it is of outmost importance that the cluster management keeps itself updated by participating in technical and management training on a regular basis. The reason for the neglect of further education and training is often a lack of budget.

4. 65 percent of the cluster organisations **do not have a stable financial outlook** that goes beyond the next two years. The reason for this can be found in the fact that many cluster organisations receive financial support from public programmes that is often limited in time. Another explanation is that yet they have not developed a convincing "business case" that encourages cluster participants to finance the cluster management on a more long-term basis.

5. **Communication** is an area in which European cluster organisations can improve. More than half does not have a website that provides sufficient information on cluster participants and cluster projects in order to attract potential partners.

6. Cluster organisations were asked to present success stories to provide evidence of their effect on industry development. Although most of the cluster organisations are able to present good projects and initiatives that indeed demonstrate good work, **only a few cluster organisations can present success stories that qualify as an "excellent success story"** in the sense that projects are somehow unique and ground-breaking in terms of entering new territories of cluster development and activities that change existing structures in a profound way, e. g. joint development of study courses with universities that contribute to skills development in emerging industries.

7. 40 percent of the cluster organisations **do not conduct satisfaction surveys** among their cluster participants, although such surveys help to collect information about the support needs of cluster participants and provide feedback on how successful the cluster organisation is working. Such feedback is essential for further developing a strategy and a service portfolio that facilitates the development of the cluster. It may also help to develop services for which cluster participants are ready to pay.

These weaknesses are common to all European cluster organisations. **While there are no significantly different patterns for cluster organisations from one of the strong European economies (Group D, Figure 4)**, such can be observed for cluster organisations from Central and Eastern Europe or Southern Europe.

Cluster organisations from the Central and Eastern European Member States feature a number of significant weaknesses in addition to the ones described above (**Figure 3**):

1. Most clusters feature a **sub-critical number of committed cluster participants**. Two thirds of the clusters have less than 40 participants. A minimum of 40 participants appears to be necessary to have a sufficient nurturing ground for the development of ideas and projects.
2. Clusters are **not well-integrated in the national and regional innovation system**. While universities and research institutions participate in the clusters, clusters interact only to a limited extent with relevant innovation service providers such as business incubators or technology transfer agencies.
3. 65 percent of the cluster organisations **offer only a limited number of services to the cluster participants or focus only on few areas**. This is not to say that more is always better, but in comparison with excellent cluster organisations that have been awarded with the Gold Label of Cluster Management Excellence they are underperformers. In order to assist facilitate innovation in a cluster the service portfolio of cluster organisations should include at least the following service areas: information/market intelligence, matchmaking, initiation of R&D and innovation projects, promotion of the cluster and internationalisation. Human development initiatives or support of entrepreneurship are also important areas.
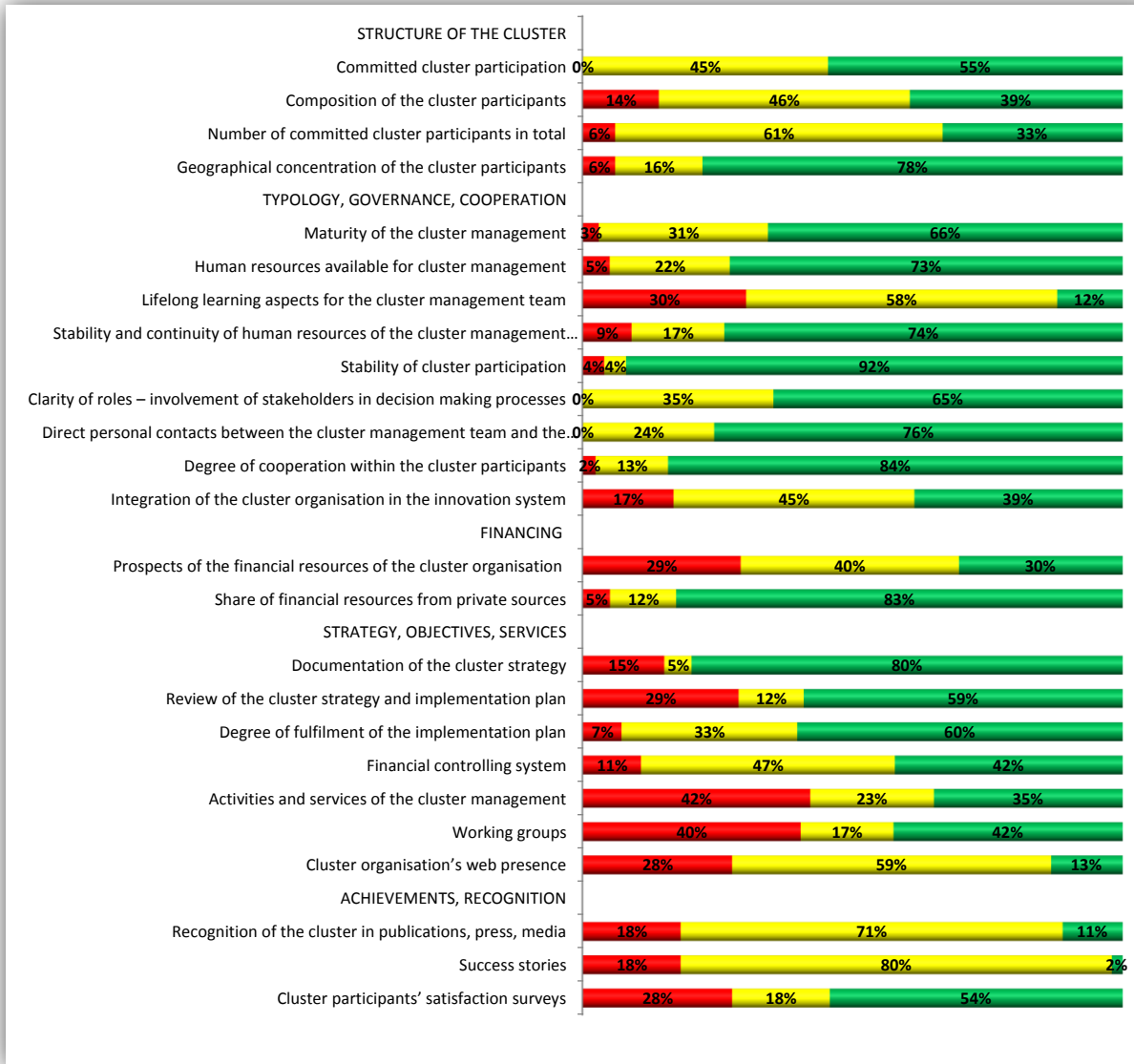
Figure 3: Weaknesses of cluster organisations – Group B: Central and Eastern European EU Member States

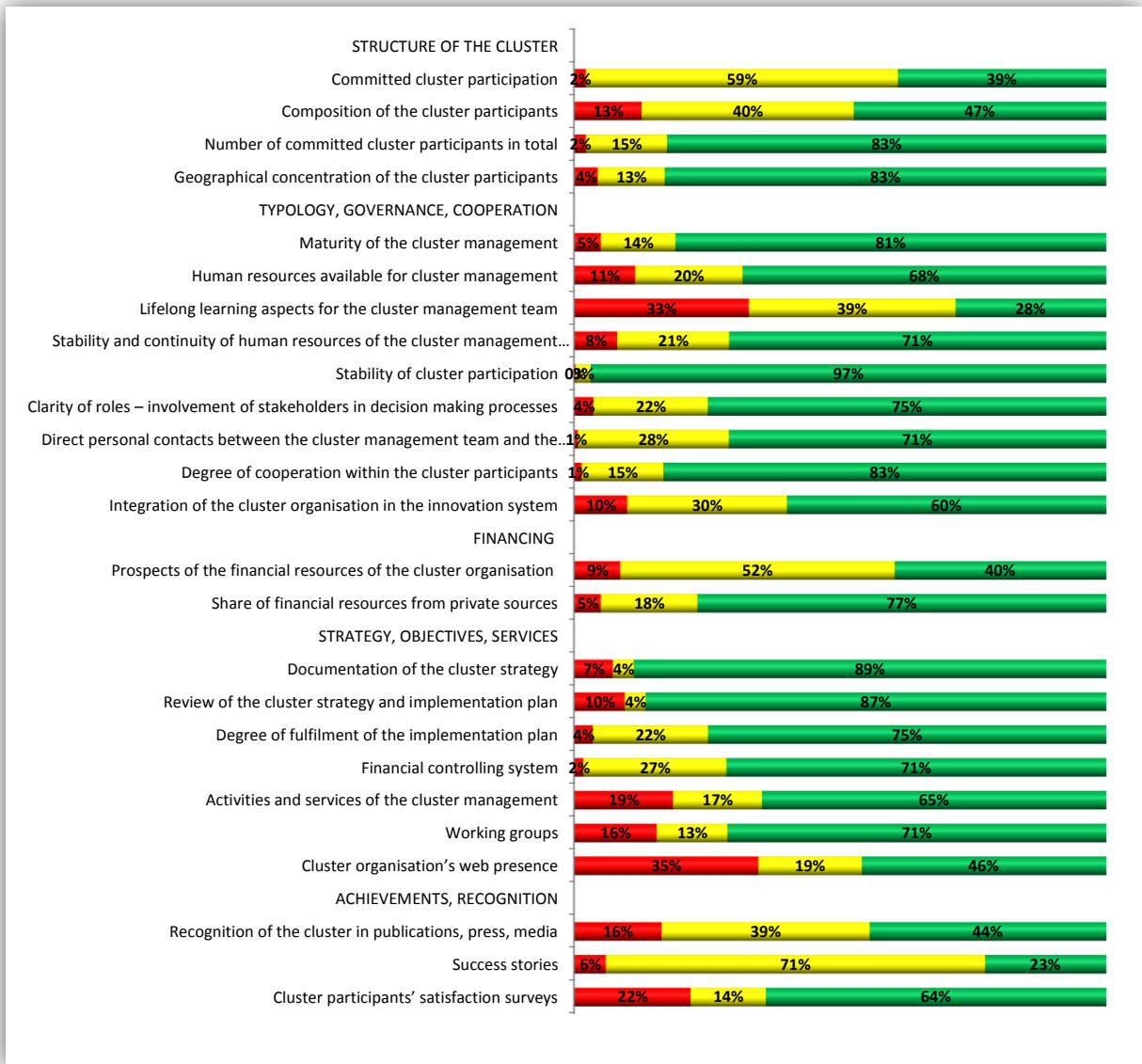| STRUCTURE OF THE CLUSTER			
Committed cluster participation	2%	59%	39%
Composition of the cluster participants	13%	40%	47%
Number of committed cluster participants in total	2%	15%	83%
Geographical concentration of the cluster participants	4%	13%	83%
TYPOLOGY, GOVERNANCE, COOPERATION			
Maturity of the cluster management	5%	14%	81%
Human resources available for cluster management	11%	20%	68%
Lifelong learning aspects for the cluster management team	33%	39%	28%
Stability and continuity of human resources of the cluster management…	8%	21%	71%
Stability of cluster participation	0%	3%	97%
Clarity of roles – involvement of stakeholders in decision making processes	4%	22%	75%
Direct personal contacts between the cluster management team and the…	1%	28%	71%
Degree of cooperation within the cluster participants	1%	15%	83%
Integration of the cluster organisation in the innovation system	10%	30%	60%
FINANCING			
Prospects of the financial resources of the cluster organisation	9%	52%	40%
Share of financial resources from private sources	5%	18%	77%
STRATEGY, OBJECTIVES, SERVICES			
Documentation of the cluster strategy	7%	4%	89%
Review of the cluster strategy and implementation plan	10%	4%	87%
Degree of fulfilment of the implementation plan	4%	22%	75%
Financial controlling system	2%	27%	71%
Activities and services of the cluster management	19%	17%	65%
Working groups	16%	13%	71%
Cluster organisation's web presence	35%	19%	46%
ACHIEVEMENTS, RECOGNITION			
Recognition of the cluster in publications, press, media	16%	39%	44%
Success stories	6%	71%	23%
Cluster participants' satisfaction surveys	22%	14%	64%

Figure 4: Weaknesses of cluster organisations – Group C: strong European economies (DE, FR, AUT, UK, IE, DK, SE, FI, NL, BE, NO, IS)

Similar observations can be made for cluster organisations from the Southern EU Member States including Greece, Italy, Portugal and Spain (Figure 5).
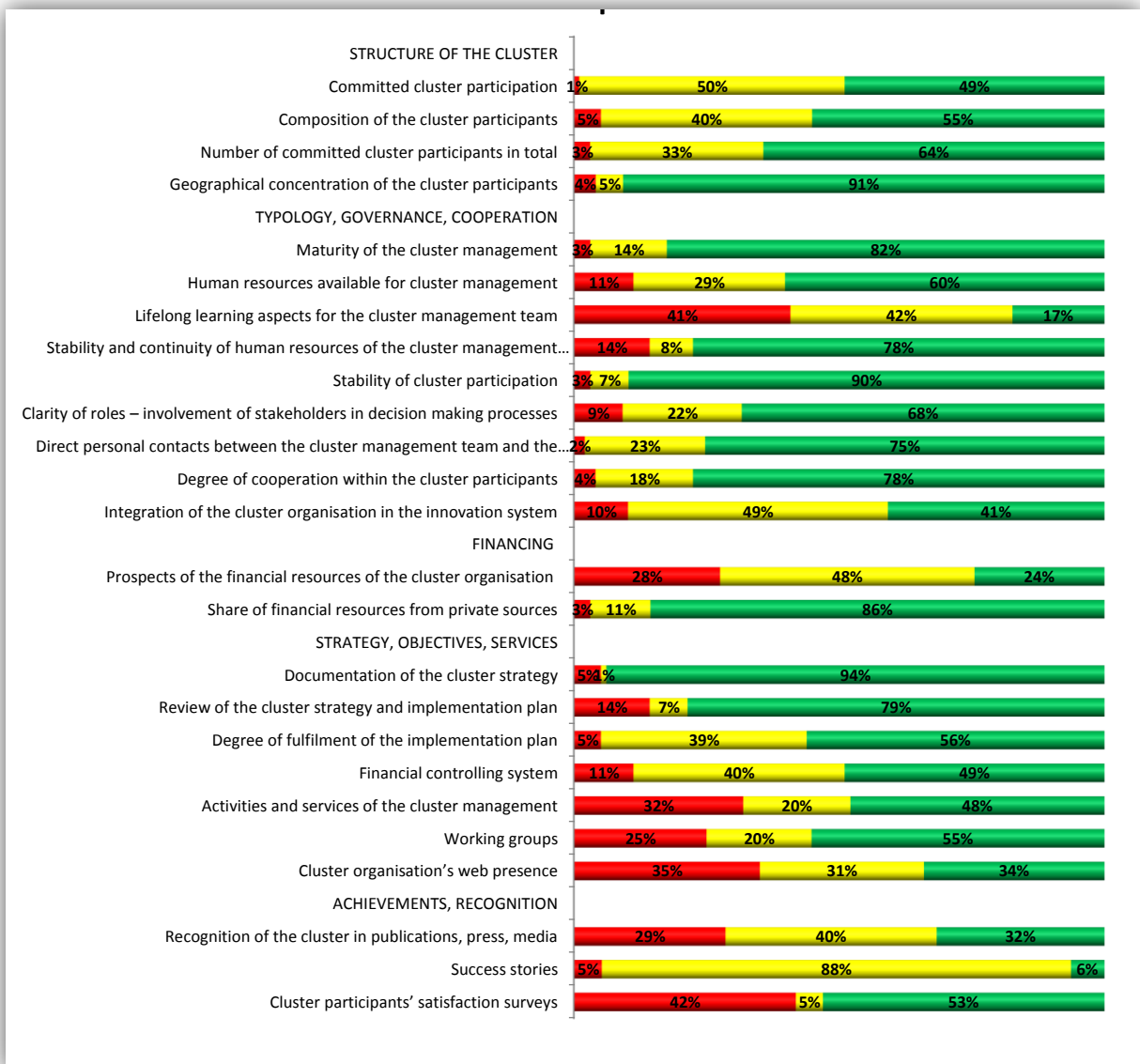

STRUCTURE OF THE CLUSTER			
Committed cluster participation	1%	50%	49%
Composition of the cluster participants	5%	40%	55%
Number of committed cluster participants in total	3%	33%	64%
Geographical concentration of the cluster participants	4% 5%		91%
TYPOLOGY, GOVERNANCE, COOPERATION			
Maturity of the cluster management	3% 14%		82%
Human resources available for cluster management	11%	29%	60%
Lifelong learning aspects for the cluster management team	41%	42%	17%
Stability and continuity of human resources of the cluster management…	14% 8%		78%
Stability of cluster participation	3% 7%		90%
Clarity of roles – involvement of stakeholders in decision making processes	9%	22%	68%
Direct personal contacts between the cluster management team and the…	2%	23%	75%
Degree of cooperation within the cluster participants	4%	18%	78%
Integration of the cluster organisation in the innovation system	10%	49%	41%
FINANCING			
Prospects of the financial resources of the cluster organisation	28%	48%	24%
Share of financial resources from private sources	3% 11%		86%
STRATEGY, OBJECTIVES, SERVICES			
Documentation of the cluster strategy	5% 1%		94%
Review of the cluster strategy and implementation plan	14% 7%		79%
Degree of fulfilment of the implementation plan	5%	39%	56%
Financial controlling system	11%	40%	49%
Activities and services of the cluster management	32%	20%	48%
Working groups	25%	20%	55%
Cluster organisation's web presence	35%	31%	34%
ACHIEVEMENTS, RECOGNITION			
Recognition of the cluster in publications, press, media	29%	40%	32%
Success stories	5%	88%	6%
Cluster participants' satisfaction surveys	42% 5%		53%

Figure 5: Weaknesses of cluster organisations – Group D: Southern EU Member States (GR, IT, ES, PT)

3.2.2 Gold Label: Weak areas of cluster organisations

Figure 6 presents the findings from 44 European cluster organisations that have successfully participated in a gold label audit. Results show that weaknesses of gold-labelled cluster organisations are quite similar to those of bronze-labelled cluster organisations. In contrast to the bronze-labelled organisations it has to be highlighted that these cluster organisations operate on a much higher management-level than the "typical Bronze cluster". It is estimated that only about 15 per cent of the Bronze labelled clusters have the potential to meet the quality standards of the Gold Label.
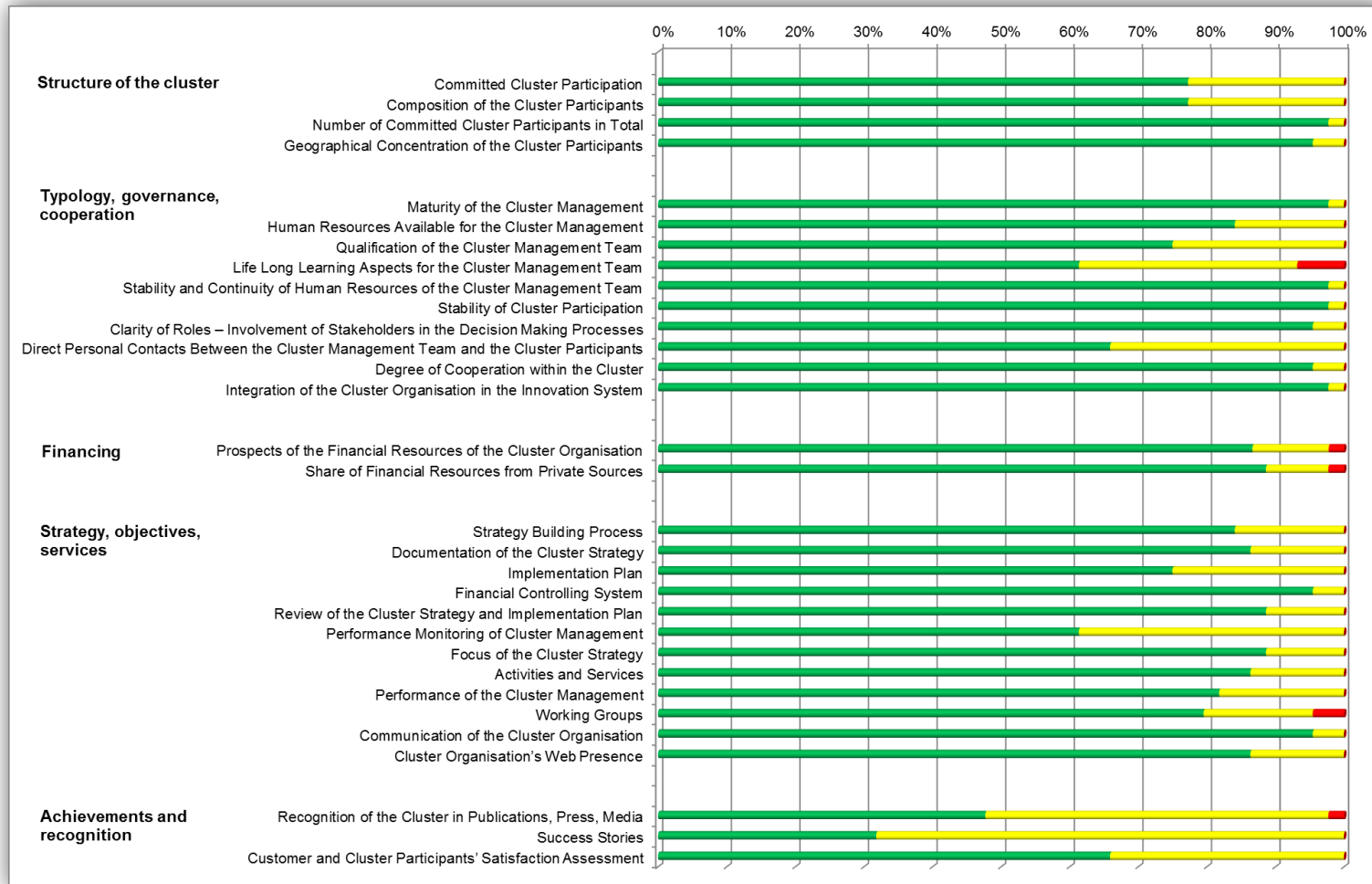
Figure 6: Results – Gold Label Assessments

3.1 Size of clusters and participation of SME

European clusters are dominated by SME as Figure 7 demonstrates. The ration between SME, non-SME, research actors (universities and research institutes), service providers (e. g. consultants or financial intermediaries) and government agencies is similar irrespective of the country of origin of the cluster, except for the share of non-SME which is slightly higher in clusters located in one of the "strong European economies" (Group C).

Figure 7: Composition of clusters – average size and share of SME, non-SME, research actors (universities and research institutions), service providers and government agencies

3.2 Industry is setting the strategic agenda of European clusters

The strategic agenda of European clusters is set by industry. Being asked who is the agenda setter in their cluster the majority of cluster managers rated the influence of industry on a scale from of 1 to 5, (where 1 is "research-driven" and 5 is "industry-driven") as 4 or 5. In terms of differences between country groups, one can see that clusters from the Central and Eastern European tend to be more driven by the research sector (Group B), while clusters in the strong European economies (Group C) and in Southern Europe (Group D) in tend to be more driven by industry (Figure 8).
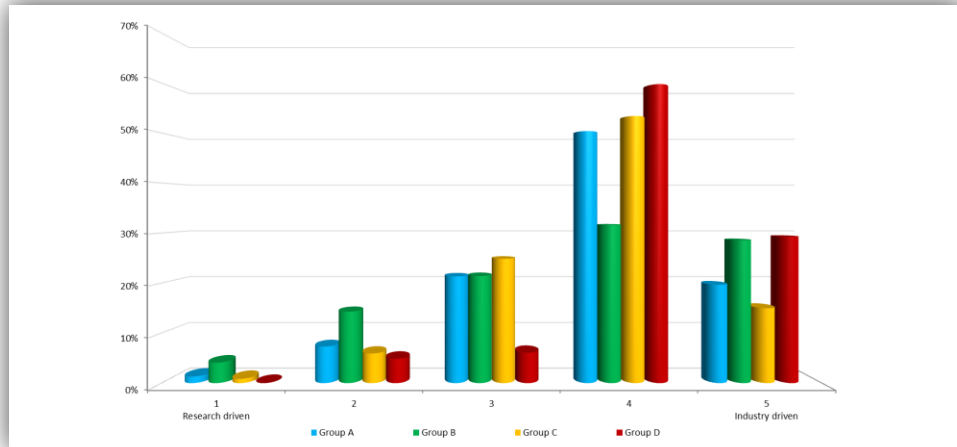
Figure 8: Agenda setters in a cluster – analysis by country groups

In terms of differences between technology areas benchmarking data demonstrates that in principle in all areas industry sets the agenda, except for health and medical science and sports/leisure/tourism where more clusters can be found that are driven by the research sector. Production and engineering, the construction/building sector and transportation and mobility are technology areas in which industry dominates most as the driving force of the cluster (Figure 9).

Figure 9: Agenda setters in clusters – analysis by technology areas

3.3   Cluster strategies

Strategies of clusters are key for a successful development of a cluster. Such strategies are developed by the cluster organisation ideally in close collaboration with the cluster participants. The following chapters present observations made in terms of strategic priorities.

3.3.1   Thematic and geographic strategic priorities of cluster organisations

For the different groups of countries the thematic and geographic priorities of the strategies of cluster organisations are illustrated in the following figures. Figure 10 presents the thematic priorities and main service categories of cluster organisations. Figure 12 shows the geographical strategic priorities of cluster organisations (international, national, or local/regional) as far as business development activities or collaborative technology development actions are concerned. The percentages indicated in the radar charts reflect the relevance of the different strategic priorities in the overall strategy.

While – as the blue line in Figure 10 demonstrates - from an overall perspective "collaborative technology, development, technology transfer or R&D" is a key thematic strategic priority for all European cluster organisations as it is "exchange of information, matchmaking and experience among cluster participants", there is an interesting differences between the different "groups of countries".

Cluster organisations in the "strong European economies" (yellow line, Group C) put more emphasis on "exchange of information, matchmaking and exchange of experience among participants" than cluster organisations from the Central European EU Member States (green line, Group B) and the Southern part of Europe (red line, Group D). They put more emphasis on the promotion of business activities, which is in particular the case with cluster organisations from Spain, Portugal, Italy and Greece. Business development does not play a huge role for cluster organisations in the "strong European economies".
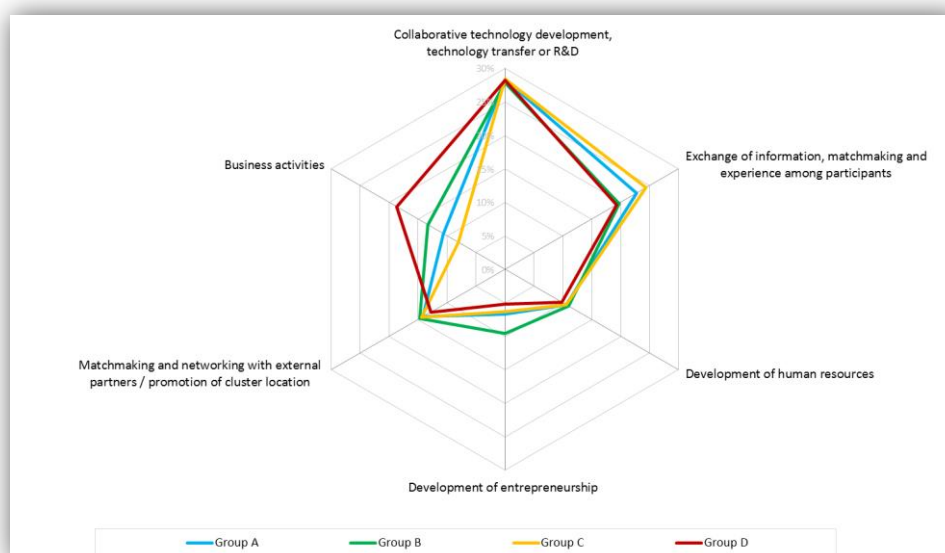

Figure 10: Thematic strategic priorities of cluster organisations

Success stories that are reported by the cluster organisations in the context of the benchmarking suggest that "collaborative technology development, technology transfer or R&D" play indeed an important role for clusters in the Central and Eastern European Countries as well as in Spain, Portugal, Italy and Greece. However, these activities concern in most cases "incremental innovation" in the sense of replicating or adapting already existing products and services. This is not to say that there are no examples of "radical innovations", but it appears from the success stories that this more common among clusters and cluster organisations that are located in one of the strong European economies. This observation is consistent with the results of the Innovation Union Scoreboard 2014 which show that countries classified as "modest innovators" or "moderate innovators" are located in Central and Eastern or Southern Europe, while "innovation followers" or "innovation leaders" are to be found among the strong European economies (Figure 11).
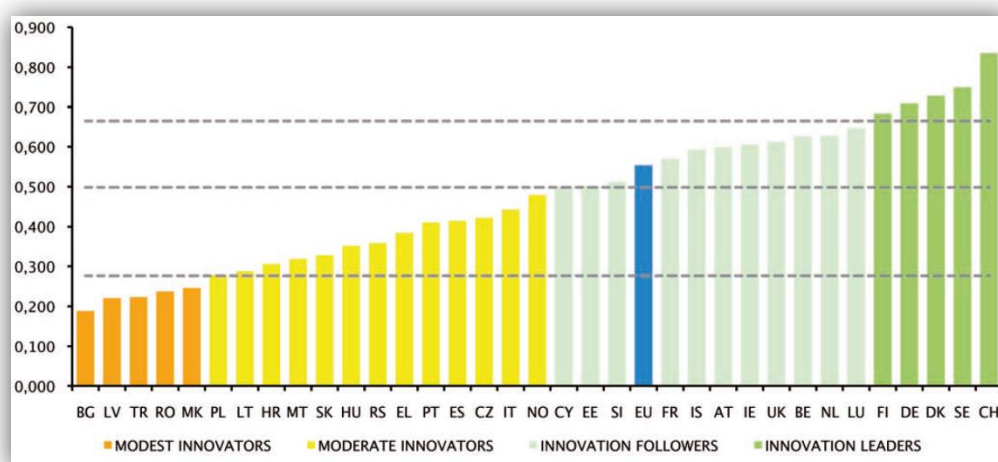

Figure 11: Innovation performance in Europe (European Commission, 2014: Innovation Union Scoreboard 2014, p. 28)

The strategic business development activities of cluster organisations irrespective of their location in Europe are geared towards international markets which includes Europe and overseas. In terms of "collaborative technology, development, technology transfer or R&D" cluster organisations are very much focussed on regional and national collaborations (Figure 12). This observation suggests that cluster-based R&D and innovation activities take place within its regional innovation eco-system, while international markets are strategically addressed to sell products and services "of the cluster".
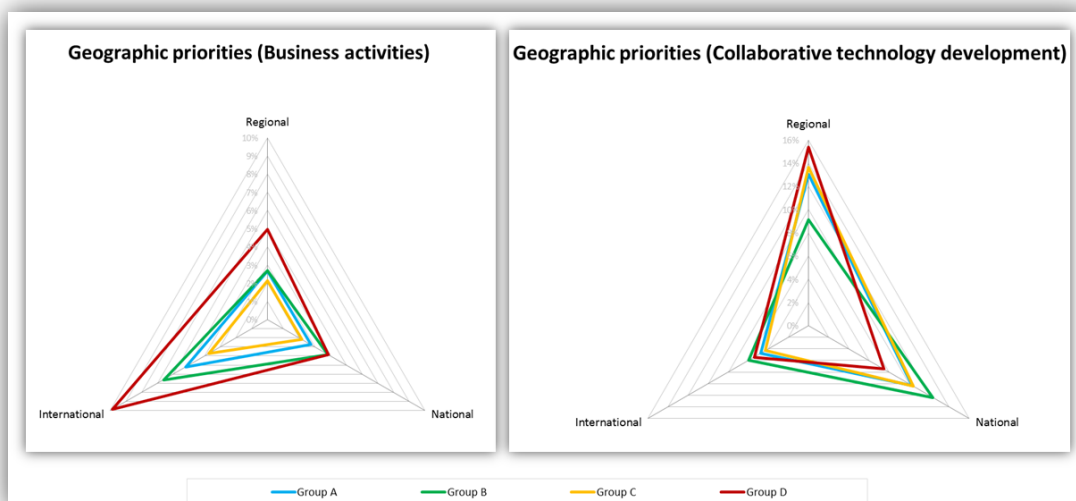
Figure 12: Geographical priorities of strategies (the size of the triangulum reflects the thematic relevance of the strategic area in the overall strategy)

Figure 13 illustrates the thematic priorities of cluster organisations in different industrial sectors. "Exchange of information, matchmaking and experience among participants" and "Matchmaking and networking with external partners" is of high priority irrespective of the industrial sector. Differences can be established with regard to "collaborative technology development, technology transfer and R&D" which demonstrate that this plays a more prominent role in industries that are traditionally research-intensive such as biotechnology or new materials and chemistry.

But there are also sectors such as aviation and space, energy and environment, food production and transportation and mobility that are not the typical traditionally research-driven industries, but in which collaborative technology development features high on the strategic agenda of a cluster organisation. This may indicate responses of industry to economic and societal challenges developing for example from resource and energy efficiency, climate change or demographic change.

The strategic relevance of the promotion of business activities of cluster participants differs from industry to industry. In general the promotion of business activities is not the top strategic priority of cluster organisations, but features the same relevance across industrial sectors with a few exceptions. First exception is the industrial sector of sports/leisure/tourism where cluster organisations put more emphasis on the promotion of business activities than cluster organisations in other industries respectively technology areas. This is not a big surprise as most of these cluster organisations aim for the promotion of a particular tourism destination. Second exception concerns the industrial sectors of biotechnology, micro/nano/optical technologies and new materials and chemistry. Cluster organisations in these industries do put less emphasis on the promotion of business activities than other their peers in other industries.
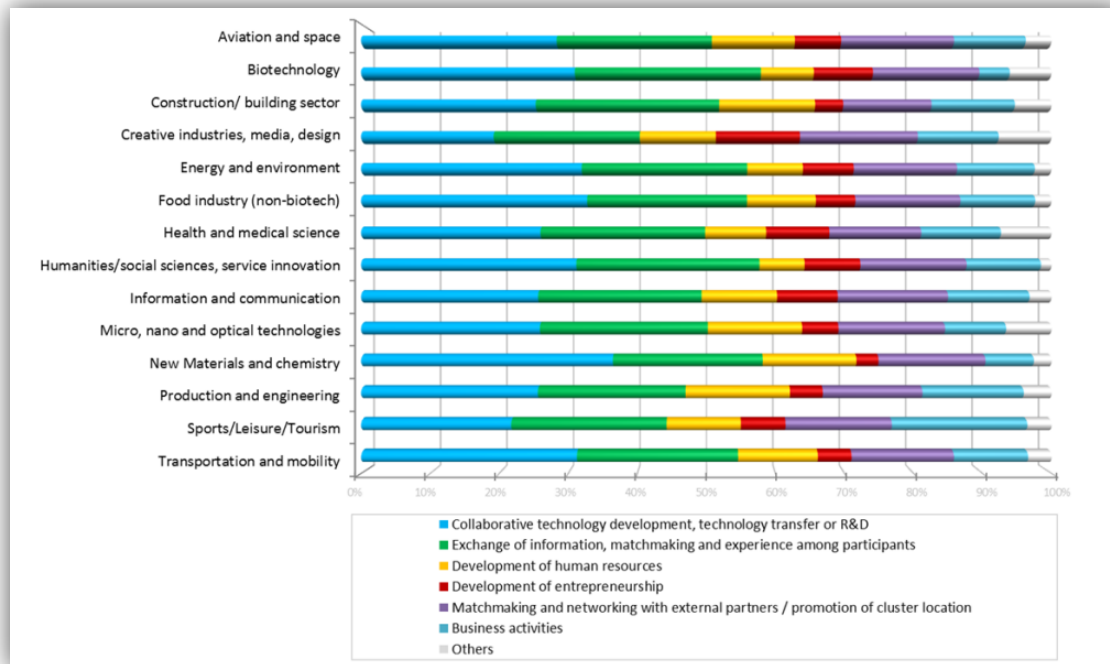
Figure 13: Thematic strategic priorities of cluster organisations: differences between industrial sectors

3.3.2   Clusters and systems innovation – it does not work without a proper strategy

There is a lot of discussion about what role cluster organisations can play for the development of new value chains and emerging industries. Policy makers raised high expectations to cluster organisations in this respect expecting them to be a favourable environment for facilitating entrepreneurship and cross-sectoral collaboration.

It is common sense that innovation is most likely to happen at the borderlines of different industries. Thus, innovation promotion – either through industrial policy intervention or the day-to-day work of a cluster organisation – should not follow a strict sectoral approach looking at narrowly defined economic activities, but one that is looking at the borders of industrial sectors and possible linkages. Until recently most policy makers and cluster managers have understood clusters in a narrow sectoral view, but research has demonstrated that they need to be understood as an eco-system of related industries and competences featuring a broad array of cross-industry interdependencies.[3] Now there are more and more policy makers and cluster managers who are shifting their policies and programmes respectively activities towards the nurturing of cross-industry linkages.

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[3] Delgado, Mercedes/Porter, Michael E./Stern, Scott, 2014: Defining Clusters of Related Industries, NBER Working Paper No. 20375, August 2014

This change in mindset was certainly promoted through the increasing competition of European industry is confronted with in particular from Asia, but also the experience of the global financial crisis which has underlined the importance of a real economy and a strong industry. The European economy can defend its leading position in the global economy only if completely new value chains are developed that generate new globally competitive products and services. "System innovation" provides the key to this as they are much more than the mere introduction of a single new product or service to the market. Such products or services develop from the reconfiguration of existing value chains by integrating different industrial sectors in a coordinated approach. By this sectoral industrial boundaries are changed, which translates into an improvement of the overall efficiency of the economy and the innovation eco-system. This goes in hand with the development and testing of entirely new business models.

Clusters represent an ideal breeding ground for experimenting with such new business models as they offer a lot of opportunities for the creation of new value chains and new customers. Cluster organisations, whose main rationale is to network different stakeholders in a cluster, are ideal intermediaries for creating an "open space" or brokerage platform, where businesses, knowledge institutions and business support organisations can meet to search for and explore radically new, cross-sectoral business solutions. It goes without saying, that such a role of a cluster organisation can only have substance if it is underlined by a strategy that goes beyond the generation of individual projects or innovation driven more by chance than logic. Strategies that address the development of entirely new value chains need to follow a holistic approach aiming for developing solutions to industrial or societal challenges that cannot be "localized" in narrow industrial classifications.

Insights into cluster strategies and service portfolios of cluster organisations that have been gained from benchmarking and quality labelling demonstrate that yet the majority of cluster organisations do not follow in their daily work a strategy that aims for "holistic approaches". Although guided by a strategy they are following a rather "ad hoc approach" that is informed mainly by the priorities of the R&D and business development funding programmes that are

Figure 14: Solitaire projects with limited strategic linkages

available at a given point in time. This results in a number of rather solitaire projects that have limited or no strategic linkages at all. This observation applies in particular to cluster organisations that are
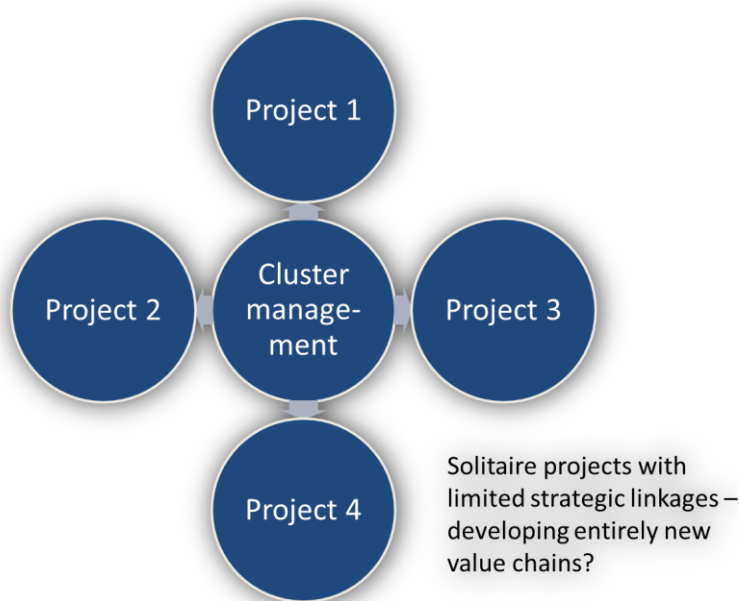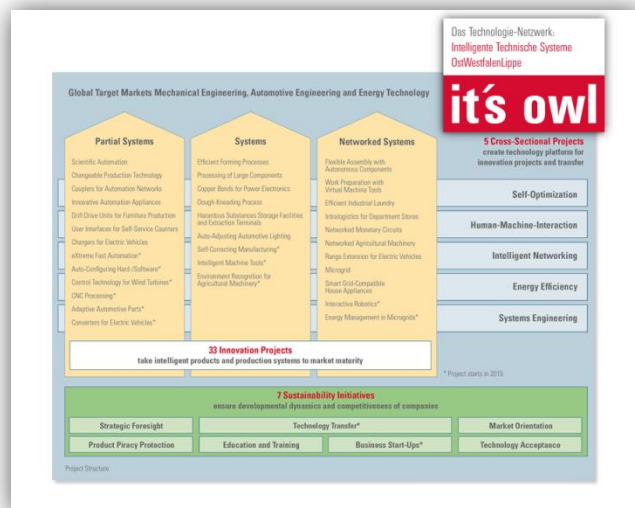
driven mainly by public stakeholders or through cluster programmes without clear targets. These cluster organisations are mostly following a "me-too" approach focussing on a specific industry trying to replicate successful cluster organisations. To put it in provocative terms: Typically, this type of cluster organisations represents a kind of "hunting community" that is chasing for all sorts of projects that are somehow connected to an overall objective of developing the region or the industry. This is not to say that they are not successful in terms of promoting industrial development along an existing value chain, but it is not likely that they will create entirely new value chains.

In contrast, in recent years there are more and more cluster organisations that are looking beyond the borders of industrial sectors by integrating different sectors within an existing or newly emerging value chain. Projects of these cluster organisations are not driven by chance, but pursue the common objective of the cluster actors of developing systemic solutions for new markets and technology areas. Their strategies are much more sophisticated and combine R&D projects with technology transfer and market development activities that are coordinated by a highly professional cluster organisation based on a business model that is owned by all cluster stakeholders.

A very good example of such a sophisticated strategy can be found at the management organisation of the cluster **"it's owl – Intelligent Technology Systems OstWestfalenLippe"**. it's owl is a German cluster supported under the Leading Edge-Cluster Programme of the Federal Ministry of Education and Research (BMBF). The cluster is regarded as a pioneer for Industry 4.0 and gathers 174 companies, research institutes and organizations from various industries such as mechanical engineering, automotive components, agricultural machinery, industrial laundry technology, electronics and ICT. In a joint effort of economy and science they approach the innovation leap from mechatronics towards Intelligent

To read more about the cluster „it's owl" visit **www.its-owl.com/home/.**

Technical Systems. At its core are more than thirty cross-sectoral innovation projects that are combined with so-called "sustainability initiatives" to ensure technology transfer among cluster participants and commercialisation of the new products at the global market. The cluster management organisation – a team of 14 management and technology experts – does not only coordinate the different projects, but provides also services such as consulting, marketing and technology transfer to make sure that results from the projects are effectively and efficiently used by the cluster members.
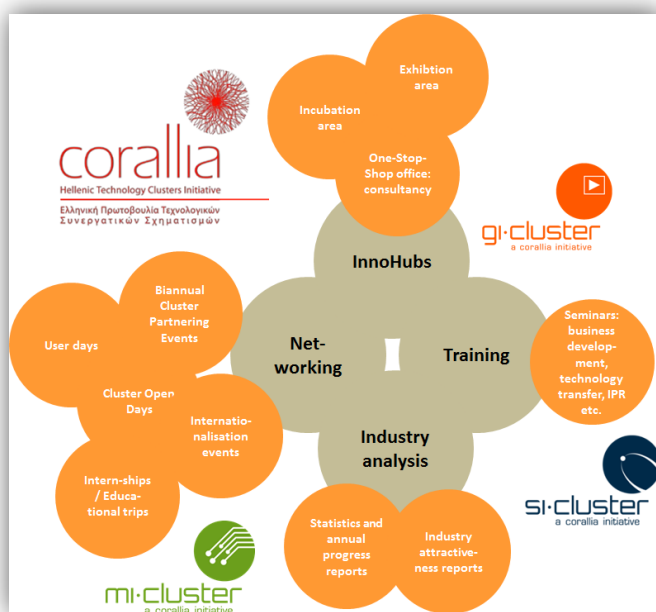
Such strategies are result from evolutionary processes as illustrated by the example of the **Chemical Cluster of Bavaria** – whose strategy is as sophisticated as the one mentioned above: In its initial days 2007-2009 the cluster was established as a networking platform for exchange of knowledge among companies and academia to further develop the value chain of the chemical industry. Following its successful networking activities the cluster organisation took greater responsibility in managing R&D projects on behalf of the cluster participants. At the same time the cluster organisation realised campaigns to bring R&D results to the market by initialising "innovation dialogues" with important customer branches such as the consumer goods and automotive industry.

To read more about the Chemical Cluster visit **www.chemiecluster-bayern.de.**

Today, supported by through an excellently managed cluster organisation, cluster actors consider the cluster as an "investment case" pursuing the strategic objective through integrating customer demands in R&D projects from the very beginning.[4]

To read more Corallia visit **www.corallia.org.**

Another good example for combining services following a strategy that aims at the promotion of cross-sectoral fertilization is provided by the Greek **Corallia – Hellenic Technology Cluster Initiative**. Corallia host three different clusters: gi-Cluster (Innovative Gaming Technologies and Creative Content cluster), mi-Cluster (Nano/Microelectronics-based Systems and Applications Cluster) and si-Cluster (Space Technologies and Applications Cluster). In order to make sure that each cluster benefits from the potential of the others Corallia has organised four key service portfolios with specific individual services.

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[4] See strategy of the Chemie Cluster Bayern: Agenda 2013-2017. Versteckte Märkte erschließen, pp. 12-15, http://www.chemiecluster-bayern.de/fileadmin/Redaktion/News_Alert__1/cluster_agenda_2013-2017_Web-Einzelseiten.pdf

3.4   Cluster organisations and SME support services

3.4.1   Effective Services Depend on a Good Strategy

There is no doubt that services are the key instrument of a cluster management organisation to facilitate collaboration among cluster participants. Through their tools and instruments cluster management organisations can trigger a certain behaviour of companies, research institutions, universities and other cluster stakeholders which does not have effect on the individual cluster actor only, but also on the cluster in its entirety.

Results of the pan-European cluster benchmarking programme "NGPExcellence – Cluster Excellence in the Nordic Countries, Germany and Poland" have demonstrated that there is a causal relationship between the services of a cluster organisation and R&D and business activities of SME. [5] There are key impact-relevant services that should be offered by any cluster management organisation in support of activities of cluster participants. It is not about an "either/or" of services, but about the integrated offer of services to commercialise R&D results and thus to trigger innovation-based economic growth. Cluster management organisations that feature such an integration of services are typically based on a strategy that addresses the support needs of the cluster participants.

Figure 15 shows such an integrated portfolio of key impact-relevant services that has an effect on business and R&D activities of SME cluster participants by sequencing services such as internal member matching to bring cluster participants together, organizing workshops or thematic events to further discuss ideas that developed from the matchmaking and apply for funding for projects that are the outcome of workshops or thematic events.
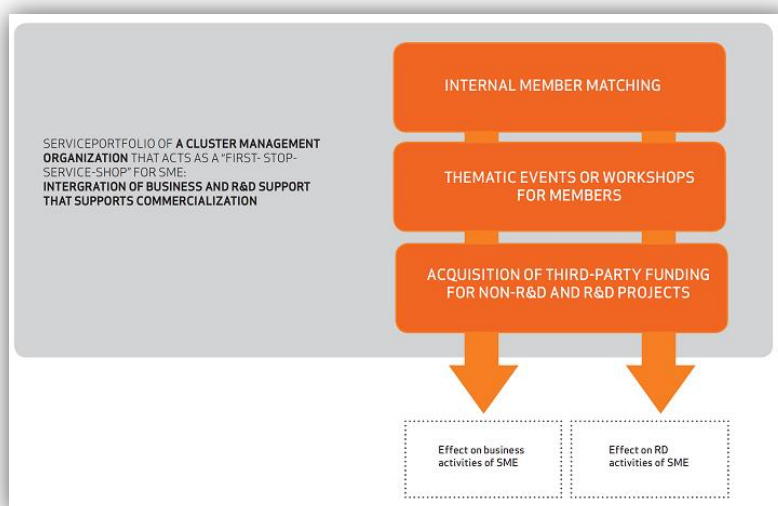

Figure 15: Integrated service portfolio of a cluster organisation

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[5] Christensen, Thomas Alslev/Lämmer-Gamp, Thomas/Meier zu Köcker, Gerd, 2012: Let's make a perfect cluster policy and cluster programme. Smart recommendations for policy makers, Berlin/Copenhagen, pp. 32-34

The analysis of the relationship between the intensity of individual services and the overall effect of the cluster management's activities on business and R&D activities of SME demonstrated that a high intensity of service provision does not necessarily result in a large effect of the cluster management's activities. Creating effects is therefore not only about the quantity of service provisions, but in particular about the quality of service provision in terms of the development, content and delivery of services. It is also the combination and interaction of different services that creates the effect of the cluster management's activities on the R&D and business activities of SME. This refers to the quality or excellence of the cluster management organisation in terms of a professional development and implementation of services that address the needs of the cluster participants.

Analysis of service portfolios of cluster organisations that have been awarded with a Gold Label of the European Cluster Excellence Initiative has revealed an interesting insight into how cluster organisations promote cross-sectoral collaboration. Not all, but many of the Gold labelled cluster organisations address cross-sectoral collaboration as a key strategic priority in the future. They have realised that the development of new value chains is key to the development of their industry. However, there is not the "one-and-only cross-sectoral collaboration instrument" that is used by them to translate their strategic objectives into tangible results, but they combine different instruments to facilitate cross-sectoral collaboration, including matchmaking events, working groups or R&D projects. It is not a question whether a cluster organisation needs specific cross-sectoral collaboration instruments, but a question of how already existing instruments are coordinated in a service portfolio that strategically addresses cross-sector collaboration. Figure 16 presents such a service portfolio that appears to be most promising to support the development of new value chains across industrial sectors.
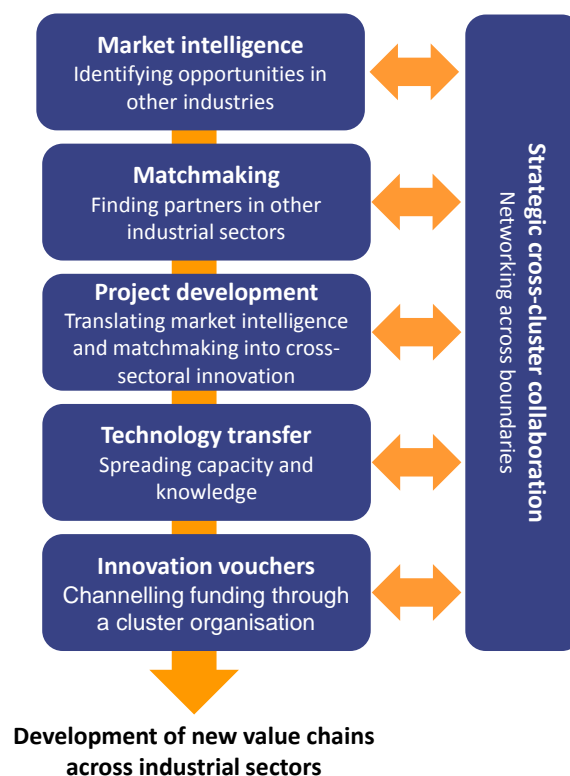

Figure 16: Service portfolio for the strategic promotion of cross-sectoral collaboration

Every new value chain or emerging industry starts with the observation that there is an opportunity for the development of a new market (= "market intelligence services"), then partners are needed to develop ideas how one can take advantage of these opportunities (= "matchmaking services"), once ideas are born, they need to be translated into projects (= "project development services"), new knowledge might be worth to be shared with others (= "technology transfer services") and funding is required (= "innovation vouchers"). Last but least, it is of outmost importance to reach out to other sectors on a constant basis (= "strategic cross-cluster collaboration").

3.4.2 Service portfolios of cluster organisations: facilitation of cooperation

The analysis of the service portfolios of cluster organisation demonstrates that cluster organisations in the "strong European economies" (Group C) are more active in the facilitation of collaboration among the cluster participants and the development of cluster projects than their peers from Central and Eastern Europe (Group B) and Southern Europe (Group D) (Figure 17).

This observation applies in particular to the "organisation of task forces and working groups", "internal member matching" and "thematic events and workshops for cluster participants" which are often the starting point for "collaborative projects of the cluster participants without third party funding" and "third-party funded projects". This connection between the levels of activities to initiate collaboration and the number initiated projects can be seen in Figure 17.
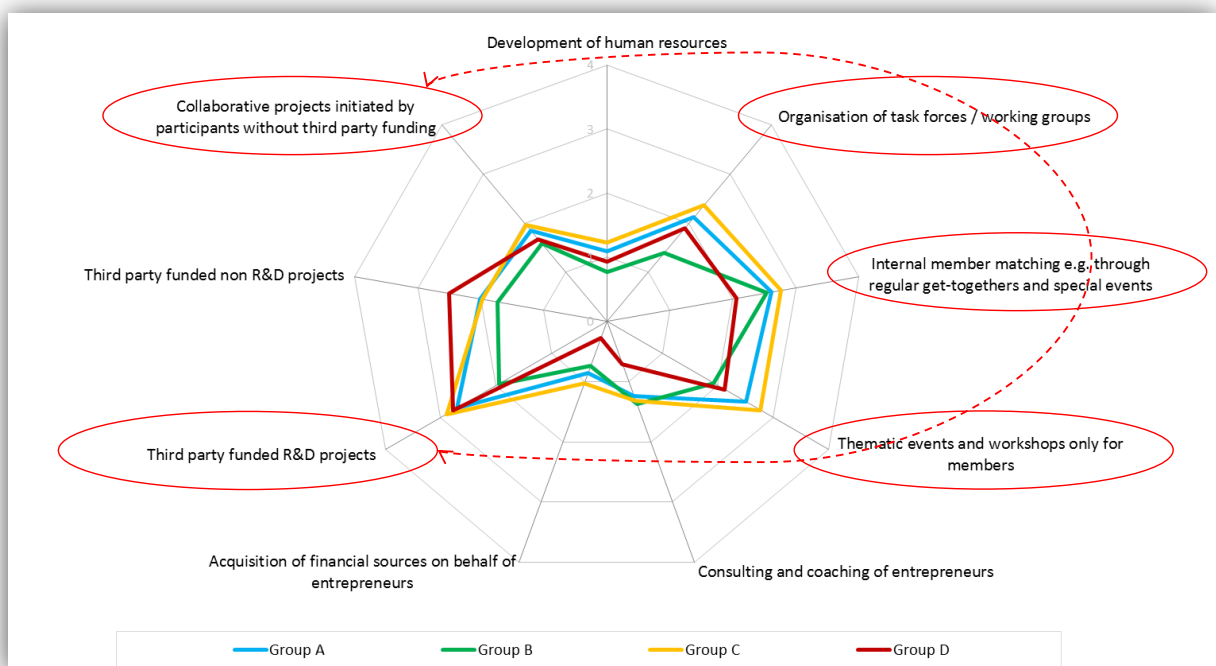

Figure 17: Services to facilitate collaboration within the cluster and the development of cluster projects

Cluster organisations from the "strong European economies" (Group C) are also more active in terms of the facilitation of collaboration with other clusters and other external actors (Figure 18).
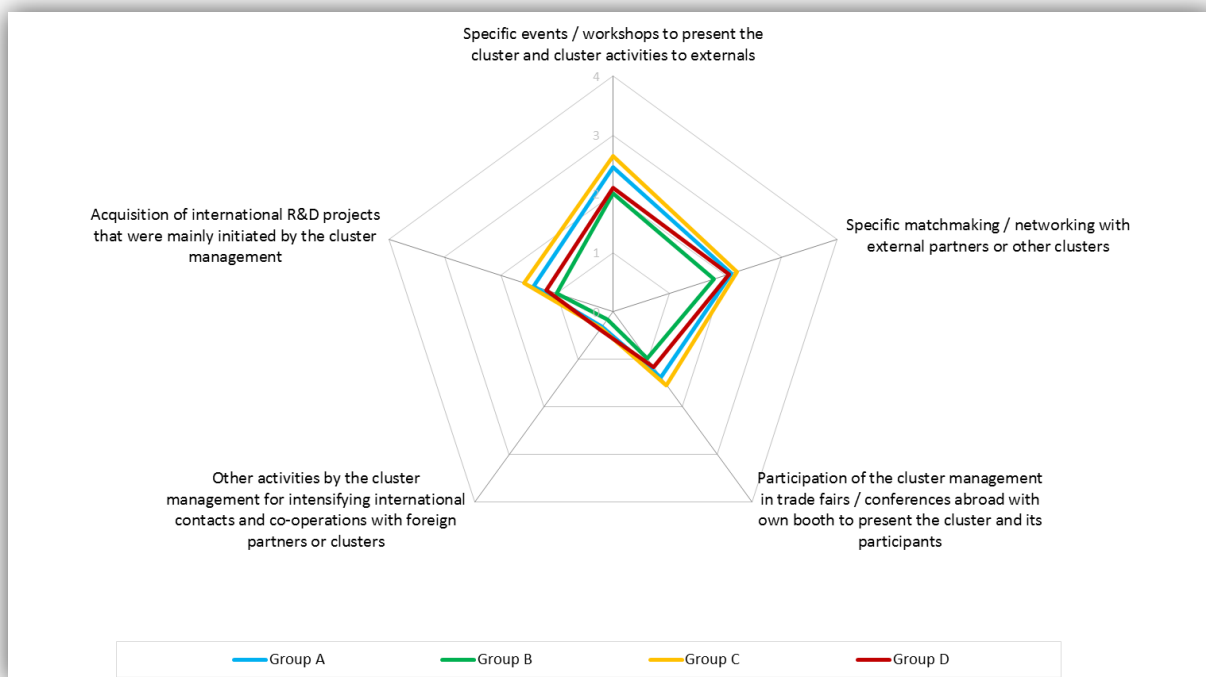

Figure 18: Services to facilitate collaboration with other clusters and other external actors

3.4.3 Cluster services – examples from Bronze and Gold Clusters

This chapter provides some examples of services or instruments that are offered by European cluster organisations to support collaboration within or across the sectoral boundaries of a cluster or to support the development of SME in general.

The information was gathered in the context of Bronze and Gold Label assessments

3.4.3.1 White Papers (Virtual Dimension Center Fellbach)

The Virtual Dimension Center (VDC) is a German cluster organisation based in the city of Fellbach in South Western Germany. Established in 2002, VDC is a network for virtual engineering and supports 100 cluster members and partners with services in the business areas of information processing, matchmaking, marketing, technology management and funding management. The strategic focus of the cluster lies on simulation, visualisation, product lifecycle management (PLM), computer-aided engineering (CAE) and virtual reality (VR) along the entire virtual engineering value chain.

Although virtual reality is not a new technique with computer-simulated environments being used for more than two decades, it is becoming more and more relevant for an increasing number of industries. Yet, virtual reality environments are mainly visual experiences, but recent technological developments have also included sensor or haptic systems. Thus, more and more potential opportunities for application are developing, and consequently more and more opportunities for business development arise.

In order to assist virtual engineering companies with keeping track with new corresponding developments in other industries, the cluster organisations are constantly publishing white papers to provide guidance for new business and research and development opportunities. White papers have yet been published for opportunities in different industries such as textile, medical technologies, commercial vehicles, production, plant engineering, space and aviation and logistics. The white papers provided are prepared by the cluster management in collaboration with cluster members from both, industry and research and development. They are publicly available and provide a quick and easy access to information relevant for developing new business opportunities.

Further information about the White Papers can be found at

www.vdc-fellbach.de/downloads/whitepaper

3.4.3.2   Chemie trifft… und Markt-Check (Chemie-Cluster Bayern)

Being part of the Bavarian State Government's cluster initiative, Chemie-Cluster Bayern promotes product and process innovations for new, usually international markets. The cluster organisation links companies and research institutions of the Bavarian chemical industry by supporting research and development projects as much as business development and internationalization of the industry. Very much emphasize is placed on the facilitation of cross-industry alliances.

Within its business area "market development", the cluster organisation supports companies with the identification of "hidden markets". The target group include industrial system integrators for whom chemical industry suppliers have already developed solutions in the context of totally different value chains. To tap these hidden markets the cluster management provides comprehensive market intelligence to the cluster which goes far beyond mere market research by providing practical information relevant for product development. The Chemie-Cluster Bayern aims at developing hidden markets in

Further information about Chemie Cluster Bayern can be found at **www.chemiecluster-bayern.de**.
The Market Check can be accessed at **www.wertschoepfungspakt-chemie.de/marktcheck**.

the industry sectors of mobility (focus on space and aviation, ship building and defence), consumer goods (focus on leisure and sport articles and toys) as well as heavy and process industries (focus on extraction and processing of raw materials). By 2017, about six innovation partnerships will be realized in these areas in cooperation with the respective market leaders and industry networks.

As part of the initiative "Chemie trifft..." ("Chemistry meets…"), the cluster organisations collect so-called "challenge statements" from the R&D departments of market leaders from different industries. These challenge statements are presented to SMEs and researchers from the clusters which either present an existing product or service as a solution or develop a new solution. Cluster members who can present a solution or an idea are invited for workshops and discussions with the "challenger". Thus, it is much more than market intelligence as it also includes a matchmaking component that facilitates business contacts.

Complimentary to this "user-driven" approach, the cluster organisation also offers a "market check" for product and service developers. The market check is an initiative for a fast review of market opportunities for technical innovation in the chemicals sector. Via an online-form, SMEs and start-ups are invited to submit information about their latest developments and innovations to check market potentials. Completed forms are evaluated by "innovation godfathers" of various non-chemical industrial sectors. The cluster management organisation informs the companies within three weeks upon completion of the online questionnaire about the evaluation results. The results have a particular focus on potential markets in industrial sectors that are not yet addressed by the company.

3.4.3.3 "Environmental Technology meets…" – Cross-sectoral Speed Dating (Umweltcluster Augsburg)

Umweltcluster Bayern (Bavarian Environment Cluster) is an environmental technology cluster based in the city of Augsburg, but covering the entire German federal state of Bavaria. Main purpose of the Bavarian Environment Cluster is the strengthening and development of the environmental technology in Bavaria through networking, information and the strengthening of cooperation initiatives. The thematic focus is on recycling and waste management, water and wastewater treatment, waste and biomass-based energy production as well as on materials flow management.

Taking into account that environmental technology is a cross-cutting technology that is relevant for all industrial sectors of an economy, the cluster management introduced a new format to establish cross-cluster collaboration: "Environmental technology meets… - Cross-sectoral Speed Dating". This matchmaking event aims at enabling cluster members to look beyond their own field and get into contact with members of other clusters in order to develop new ideas, make new contacts and find possibilities for cooperation. Yet, speed dating events have been implemented together with other cluster organisations from Bavaria including the sectors industrial biotechnology, sensor technology, mechatronic and automation, forestry and wood processing and food industry.

Each event – covering four hours during an afternoon – is structured into two elements: two or three brief key note presentations provide an introduction to the key challenges of the sector, which are then followed by two speed-dating sessions for which companies can register in advance to make sure that they will meet the right partner. Results of the speed-dating are presented during the event and are further evaluated by the cluster organisation as a follow-up action. Based on the results, individual or group visits of companies are planned to further develop ideas for projects. Furthermore, stakeholders not having been involved in the project, but who might add value to the project can also are included. The overall aim is to develop from the speed-dating contacts as many cross-sectoral R&D or business development services as possible.

Further information about Environment Cluster Bavaria can be found at **www.umweltcluster.net**.

Further information on the speed dating is available at **www.umweltcluster.net/en/projekte/umwelttechnologie-meets.html**.

3.4.3.4 Competence Mapping Tool (Mechatronics Cluster Ober- und Niederösterreich)
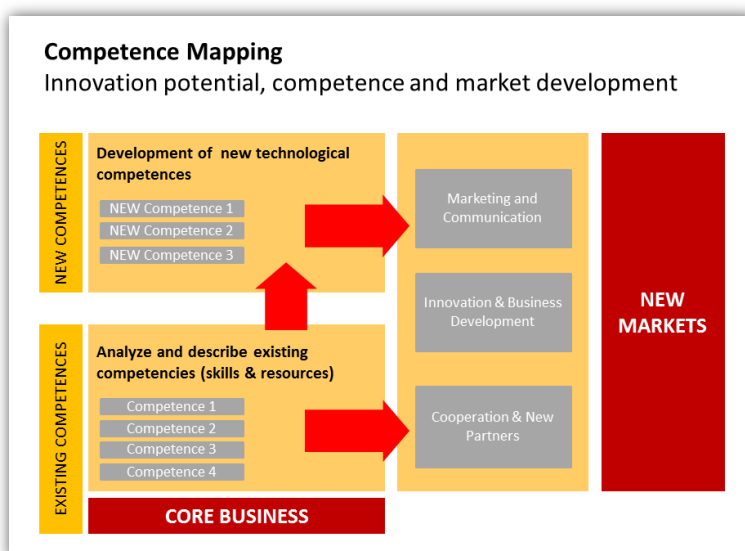
The Mechatronics Cluster (MC) is a network of companies in the mechanical engineering and plant building sector in the Austrian regions of Upper Austria and Lower Austria. The cluster is hosted by the regional development agencies Clusterland Upper Austria Ltd. and ecoplus - Lower Austria's Business Agency Ltd.

In order to identify cross-sector collaboration potentials for the industry represented in the Mechatronics-Cluster in Lower Austria, the cluster management, together with an external innovation management expert, has developed the "Competence Mapping" tool, which assists companies and research facilities in searching for and exploring radically new, cross-sectoral business solutions. The need for this tool arose from the experience that many companies define and present themselves in a very product-oriented way instead of being aware of and showing the skills and resources, in other words solutions, they offer.

The aim of the tool is to analyse companies and R&D facilities in order to detect and describe their competencies in a structured way that is easy to understand also for potential customers in other sectors and disciplines. By doing so, it identifies also missing competencies that are required to tap into new markets and to find potential partners with whom the company can team up in order to compensate these competency gaps. Furthermore, by means of patent research it supports the identification of new growth areas for the companies.

Further information about the Mechatronik Cluster can be found at **www.mechatronik-cluster.at**.

The tool, which is rather a process than a tool, consists of different procedural elements. The first step is a self-assessment of the company or the research facility, which is followed by a half-day workshop with the cluster management and other experts to discuss and structure competencies. This is accompanied by the analysis of potential markets for the company or the research facility that have not yet been tapped into. The analysis is conducted by an external service provider. Final step of the process is a second half-day workshop to discuss the insights that developed from both competence and market analysis with regard to new business opportunities.
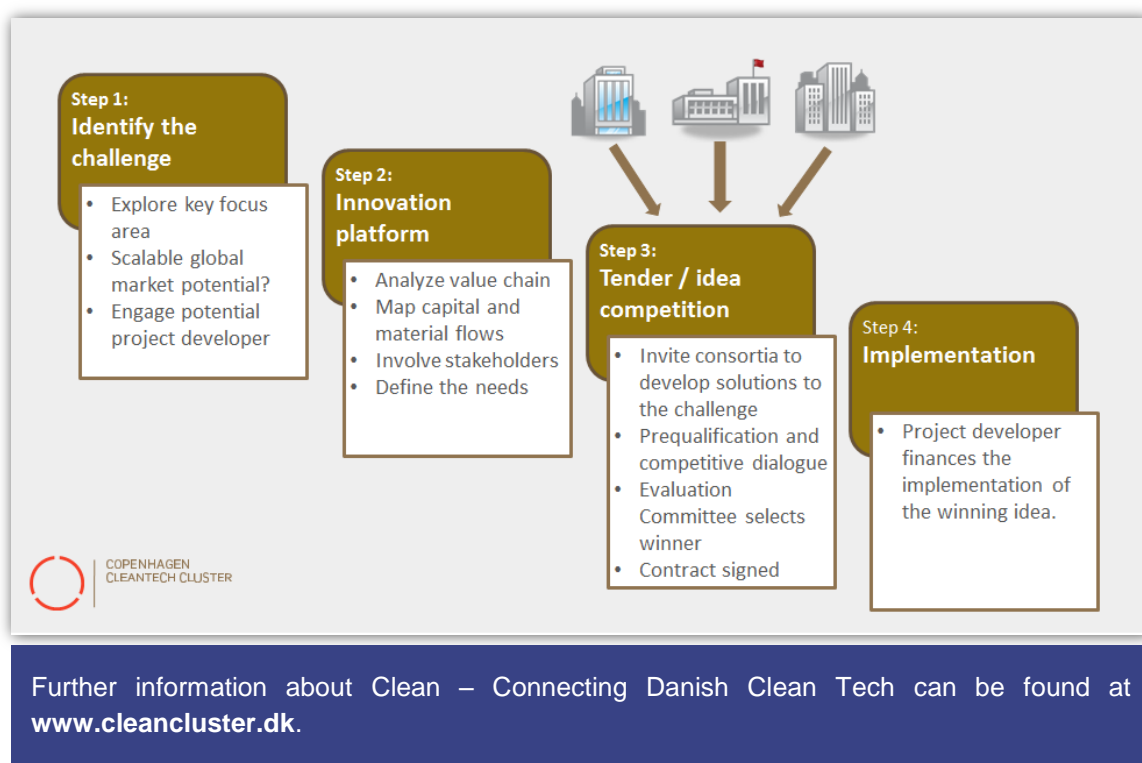
Yet, this tool has been tested and further developed in 20 companies and 15 research institutions. The tool is also being tested in Sweden, Italy and Romania in the framework of the INTERREG 4C project ClusterIX (www.clusterix.info) and shall be used for cross-regional match-making in the future. The development of a web-based-tool is planned for the future.

3.4.3.5   Innovation Platforms (CLEAN Denmark)

The Copenhagen Cleantech Cluster – now following its merger with another Danish cluster known as CLEAN – Connecting Danish Cleantech – has developed an innovation model that explicitly addresses systemic innovation. The innovation model is a method for solving large environmental challenges, which remain unresolved due to their complex nature. The rationale behind is to gather actors from across the value chain, providing them with the business incentive, and thus encouraging them to play an active part in developing innovative green solutions.

Step 1:
Identify the challenge
- Explore key focus area
- Scalable global market potential?
- Engage potential project developer

Step 2:
Innovation platform
- Analyze value chain
- Map capital and material flows
- Involve stakeholders
- Define the needs

Step 3:
Tender / idea competition
- Invite consortia to develop solutions to the challenge
- Prequalification and competitive dialogue
- Evaluation Committee selects winner
- Contract signed

Step 4:
Implementation
- Project developer finances the implementation of the winning idea.

COPENHAGEN CLEANTECH CLUSTER

Further information about Clean – Connecting Danish Clean Tech can be found at **www.cleancluster.dk**.

The process of identifying these challenges, as well as finding and implementing a viable solution consists of a number of stages. The objective behind the CLEAN innovation model is that by following a series of steps, it will lead to the implementation of concrete solutions to the problems identified while at the same time, it will foster innovation, uncover new business opportunities and strengthen Danish competencies.

Phase 1: The screening phase - identifying a problem owner and potential

The entire process starts with a problem owner - often a public authority - with a challenge that needs to be addressed. Often the problem owner does not know all aspects of the challenge due to its complexity, or has no exact idea on how a possible solution may look like. However, the problem owner is willing to buy a solution, if it is suitable for dealing with the challenge. The willingness to reach out and implement the right solution means that the problem owner is committed to invest time, knowledge and resources in the entire process. The prospective of a problem owner purchasing a

future solution - if it addresses the challenge - is an essential incentive for the companies to take part in the process. Thus, a possible challenge is put forth, CLEAN conducts a preliminary screening. Knowledge about the problem is gathered in collaboration with relevant individuals, companies and institutions in order to assess the needs and potential of an innovation platform based upon a preliminary understanding of the challenge. The screening includes an assessment of the potential and financial basis for the establishment of an innovation platform, and it has to comply with the following criteria:

    a) Is there a global market potential for a solution?
    b) Does Denmark possess the relevant competencies in this area?
    c) Are we talking about a complex challenge that the market has not been able to solve and which seems to require cross-cutting collaboration/triple helix partnerships?
    d) Is the "problem owner" who needs a new, innovative solution willing to finance and engage in an innovation process?

Based on the screening, the board of CLEAN decides whether the challenge qualifies as innovation platform, which will then further analyse the challenge. If the challenge does not comply with the above stated criteria, the process ends here.

Phase 2: The Innovation Platform

If the criteria are met, CLEAN establishes an innovation platform. The platform consists of relevant CLEAN member companies and other enterprises, relevant public authorities, knowledge institutions and experts all of who analyse and concretize the challenge under the guidance of an independent secretariat and chairman. The innovation platform analyses the challenge more thoroughly to see if the challenge may be divided into several sub-problems and whether the problem(s) can be made subject to a tender. At the end of an approx. six-month period, the innovation platform reports back to the CLEAN board, who decides if the challenge should be made subject to a proper tender process.

This stage is particularly critical, as the outcome of the innovation platform will decide on the subsequent activities. This phase can end with a) the process moving on to the next stage as the challenge has been concretized and is made subject to a tender, or b) the process is stopped as the problem is not deemed apt for a tender process (e.g. new legislation or a new market situation may create incentives that will address the problem).

Phase 3: Tender process and competitive dialogue

CLEAN will - with legal assistance - turn the concretized problem into a prequalification tender material and publish it. Apart from an overall description of the problem to be solved, the prequalification material describes which prerequisites and competencies CLEAN deems necessary in order to deal with the challenge. Before the prequalification tender is launched, the CLEAN secretariat will disseminate information about the forthcoming tender, in addition to facilitate meetings and to bring together relevant players, thereby enhancing the chance that those relevant players will join forces and establish a consortium with competencies to face the challenge. This is done by means of information meetings, networks and communication channels that CLEAN has access to.

Having received offers from different bidders, CLEAN will select the three offers which seem best equipped to solve the challenge followed by a competitive dialogue.

The competitive dialogue is a procedure whereby the problem owner can reflect upon and specify in greater detail the contents of the problem, as well as their requirements for a future solution. The

competitive dialogue thus grants the problem owner a setting to discuss this with the prequalified consortia, which in return are offered an opportunity to enter into a closer dialogue with the problem owner in order to qualify and focus their proposal for a solution. The competitive dialogue is facilitated by the CLEAN secretariat assisted by lawyers and experts in the relevant fields. This process lasts a couple of months. All questions and answers put forward in the process are available for all the prequalified consortia. The result of this competitive dialogue is a clearer picture of the problem and the availability of possible solutions both, for the problem owner and the potential bidders.

On the basis of the competitive dialogue, the CLEAN secretariat elaborates and publicizes the final tender documents, specifying the concrete challenge as well as the type of solution sought after. Finally, the consortia will each submit their proposals for a solution, and a review committee with representatives from the problem owner, the CLEAN and selected experts pick the proposal that addresses the challenge in the best possible way. As recognition of the efforts put into the process, the loosing consortia will receive remuneration.

Phase 4: Implementation

This stage is the final stage in the CLEAN innovation model. At this stage, the implementation of the winning proposal takes place. A contract is concluded between the problem owner and the winner of the tender, who will be responsible for implementing the solution. At this point, the CLEAN is no longer involved in the project and it is up to the ordering party and the winning consortia to carry out the final steps in the process.

All the way, it is a voluntary process and there is no guarantee that the winning solution will be implemented in the end. The winner will win the prize associated with the tender and eventually a new market for the solution. But the problem owner is still free to assess whether the specified solution actually meets the requirements and should be implemented in full scale or not. Likewise the consortia are free to withdraw from the process if they, for some reason, wish to do so.

Currently, there are four concrete projects in different stages following this model. The topics are:

- Big Data Digital Infrastructure ("Tender" stage, "Implementation" expected by end 2014)
- Building and Construction Waste ("Innovation Platform" finished, launch of "Tender" expected by end 2014)
- Waste Plastics ("Innovation Platform" finished, launch of "Tender" expected by August 2014)
- Sensor technology and e-coli detection in water infrastructure ("Identify the Challenge", screening of technologies)

3.4.3.6 Technology Transfer: Spreading Capacity and Knowledge - Technology Transfer in Four Stages (it's owl)

The incorporation of results from a project upon its completion or even during its implementation in company routines is often a challenge, in particular for SMEs. Therefore, technology transfer is a key issue for cluster organisations. How this can be implemented in a smart and structured approach is demonstrated by the following example:

„it's owl – Intelligent Technical Systems Ostwesftfalen-Lippe" is a German cluster financially supported under the Leading-Edge Cluster Programme of the Federal Ministry of Education and Research. Being one of fifteen clusters receiving support from this programme it's owl is an alliance of 174 companies, universities, research institutions and other stakeholders. Implementing nearly 50 R&D projects that aim at the development of intelligent technical systems, the cluster is a key driver of advanced manufacturing in Germany. Cross-sectional projects are developing new technologies for self-optimization, human-machine interaction, intelligent networking, energy efficiency and systems engineering. Including various industrial sectors, such as mechanical engineering, automotive components supplier, agricultural machinery, industrial laundry technology, electronics and ICT, the cluster is an example of cross-sectoral cluster working at the development of an emerging industry.

Projects are not limited to R&D; a strong focus is also set on technology transfer. The core of the Leading-Edge Cluster is made up of family-run businesses and a wide range of medium-sized enterprises. Often, these companies are extremely interested in the technologies produced in the cluster, even though they are not involved in implementing their own innovation projects. The technology transfer sustainability initiative is dedicated to allowing these companies access to the methods, processes and tools that have been developed. The aim is to train interested companies in how to apply this knowledge and to support cooperation with regional research institutes. The two main technology transfer tools are knowledge sharing groups and focused transfer projects. The cluster management aims at developing and implementing some 120 technology transfer projects.
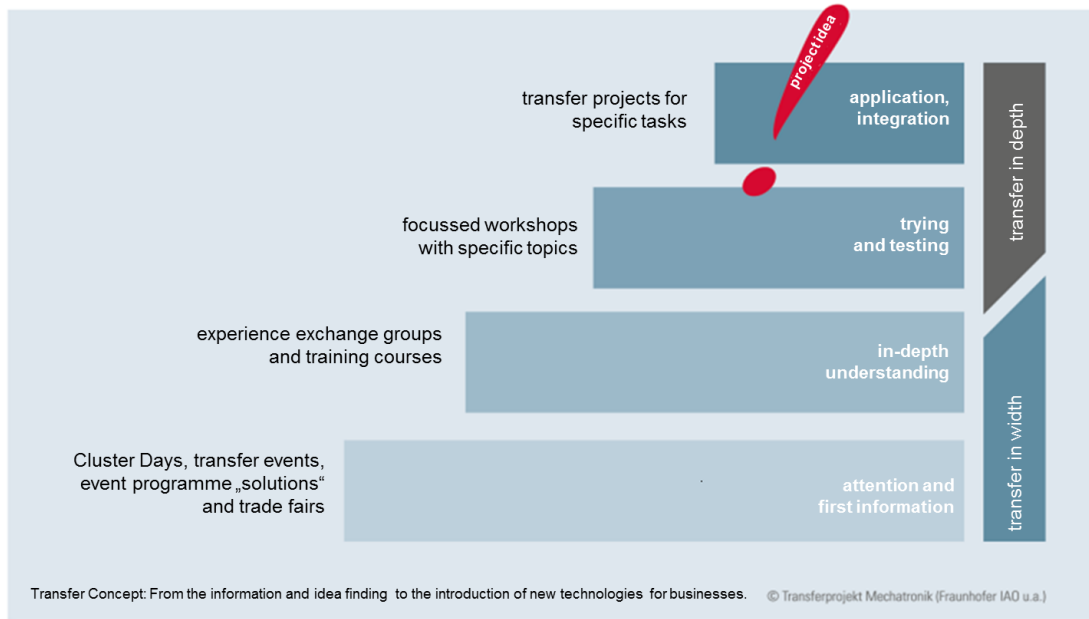
This is accomplished by designing transfer events at which interested manufacturing firms are introduced to the technology platform, and ideas for transfer projects are identified. Knowledge-sharing groups on cross-sectional project topics allow for continuous exchange between research and business sectors. This is all supplemented by workshops providing companies with a deeper understanding of the use and effects of various technologies. Concepts for transfer projects are developed during individual consultations with companies. After testing, the programmes are implemented and continuously developed in cooperation from the partners listed above.

The project increases the companies' awareness of the benefits offered by the Leading-Edge Cluster technology platform and lays the groundwork for dissemination. Transfer projects to introduce technology are developed as needed for implementation in the second phase of funding. This allows companies to increase their competitiveness and market success by optimizing their products and production processes. The results of the project are carried over to sustainable transfer tools and further education programmes. In addition to this, engineering firms in the OWL network disseminate the technology platform outside the cluster.

Technology transfer in the Leading-Edge Cluster it's OWL follows a four-stage model:

- Stage 1: In the first stage, it's OWL cluster shows, trade fair appearances and targeted information events are held to draw the attention of interested companies to the Leading-Edge Cluster and its work.
- Stage 2: Once interest has been generated, more in-depth information is provided to interested companies, for example in specialist workshops and working groups. The aim is to discuss specialist topics and technical aspects of the cluster in an easily comprehensible manner.
- Stage 3: In goal-oriented workshops, generally held on a company's premises, potential transfer partners learn how to transform their requirements into a concrete task definition.

- Stage 4: The next step is to develop tailored concepts for focused transfer projects during individual consultations with companies. After a successful application, the project is implemented.
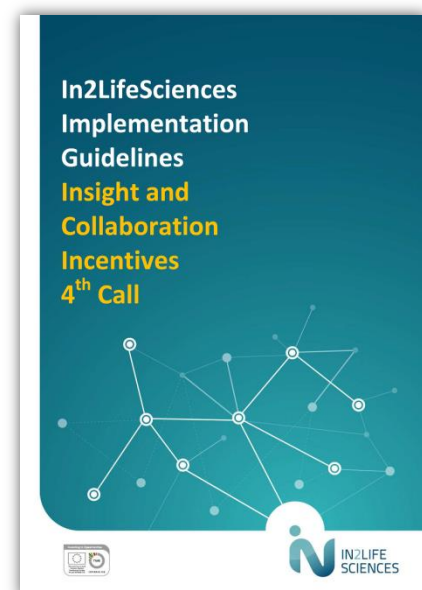

Transfer Concept: From the information and idea finding to the introduction of new technologies for businesses. © Transferprojekt Mechatronik (Fraunhofer IAO u.a.)

Further information about **it's owl – Intelligent Technical Systems OstWestfalenLippe** can be found at **www.its-owl.de**.

3.4.3.7 Innovation Vouchers: Channelling Money through a Cluster Organisation - the Example of a Cross-cluster Collaboration across Europe: Belgium, Denmark, France, Germany and the Netherlands

Of course there are lots of funding programmes from government agencies that can be used by a cluster organisation or cluster participants to get initiatives and programmes running. But yet, there are only a few examples of cluster organisations that have set up their own programmes in order to reach their strategic objectives. The example of the innovation voucher scheme of the Danish cluster organisation BioPeople is an excellent example not only of how to make use of EU Structural Funds to generate financial means for such a programme, but also for implementing such a scheme in a pan-European endeavour together with partners from Belgium, France, Germany and the Netherlands.

Innovation vouchers are promising instruments to facilitate cross-industry collaboration. The idea of innovation vouchers

is to – as it is put by a UK programme – "encourage businesses to look outside their network for new knowledge".[6] There is no doubt that such schemes create the intended results in terms of developing new products, services and processes through cooperation among companies or companies and research institutions/universities that have not cooperated until then.[7]

The Danish cluster organisation BioPeople has been successfully working with innovation vouchers for many years. Small financial incentives between EUR 500 and 7,000 for different purposes such as encouraging meetings with new international partners, cross-disciplinary collaboration or finding new innovative product or service providers supported by an online database through active brokerage of profiles between cluster managers have helped SMEs to generate further growth.

Innovation voucher schemes are an important instrument for the cluster organisation to facilitate innovation across industrial sectors. Until now, BioPeople has implemented four schemes successfully and is about to launch a new one. Currently, they are involved in a cross-country innovation voucher scheme that was developed together with clusters and business development entities from Belgium, France, Germany and the Netherlands. The scheme is part of the IN2LifeSciences project that is financed under the INTERREG 4B programme for North-West-Europe.

IN2LifeSciences - a transnational project - gives SMEs in the health sector (biotechnology, pharmaceuticals, medical technology and nutrition for human and animal health) in eight leading life sciences regions in North-West Europe easy access to a wide range of public and private experts and facilities. IN2LifeSciences is the follow-up of the successful FASILIS project in which 67 international life sciences cooperations have been initiated, some with impressive spin-offs. IN2LifeSciences enables SMEs to work with providers of expertise and equipment beyond those currently available at the regional level. Key to the project are innovation bottle necks within SMEs, whether these are technological, financial or related to marketing a new product or service in a foreign market. IN2LifeSciences will help to connect SMEs to a relevant expert or provider in the IN2LifeSciences network. To stimulate actual contact and cooperation there are three types of call-based incentives available for SMEs in the eight IN2LifeSciences regions that are looking for innovation support:

- Meet & Greet incentives: up to EUR 500 for SMEs to travel and meet relevant organisations in other regions. Applications for these incentives should be submitted and approved before the meet & greet activity takes place!
- Insight incentives of EUR 4,000 to exchange staff, receive training or contract experts to gather insight (on markets, technology, IPR, etc.)
- Collaboration incentives of EUR 7,000 for an actual collaboration on an innovative new product or service

Further information about **BioPeople** can be found at **www.biopeople.dk**.

For further details on the **IN2LifeSience project** please see **www.in2lifesciences.eu**.

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[6] *See Technology Innovation Board, Innovation Voucher Scheme, www.innovateuk.org/-/innovation-vouchers*

[7] *E.g. Cornet, Maarten/Vroomen, Björn/van der Steeg, Marc, 2006: Do innovation vouchers help SMEs to cross the bridge towards science?, CPB discussion paper, CPB Netherlands Bureau for Economic Policy Analysis, The Hague and Technopolis Group: Policy instruments for regional innovation - innovation vouchers, Brussels*

3.4.3.8   Cluster marketing: member directory as global marketing tool (NEPIC UK)

The North East of England Process Industry Cluster (NEPIC) is a membership cluster organisation working with the chemistry using industries in the North East of England. The cluster is aims to develop a competitive chemical-processing industry by building on the strong industrial base of the region. Privately owned and led by industry, NEPIC represents the sector across the broad chemistry using industries, which include commodity chemicals, fine and speciality chemicals, polymers and composites, pharmaceuticals, biotechnology, bioresources, biofuels and renewable energy and low carbon materials.

In order to promote the region in Europe and overseas NEPIC publishes an annual directory of cluster companies. The directory is distributed all over the globe potentially to about 450,000 recipients. It is a comprehensive source of products and services of 350 companies in the North-East England process industry.

The cluster management uses the directory as a principle tool to promote inward investment and generate supply chain connections for companies. Potential investors use it to evaluate the potential of the region and aid investment decisions. For cluster companies it serves as a guidebook to source products and services from fellow cluster members. But it serves also an important purpose beyond the industry by educating non-related businesses, regional and national Government, trade bodies, academic institutions, school leavers and general public use the directory on the importance of the process industries to the North East and UK economy.

Over the years many members have reported securing business through enquires that originated from the Directory and NEPIC has been able to secure business for companies at major international trade exhibitions and make supply chain connections for inward investors. The directory is also an important source of income for the cluster organisation. While a simple entry is free of charge, any additional information or logo of the company is subject to a fee.

Further information about **NEPIC** can be found at **www.nepic.co.uk**. The directory can be downloaded at **www.nepic.co.uk/media_centre/publications/directory.asp?qry=0,2038,1521**.

3.4.3.1   Attracting professionals and talents to remote places (NCESubSEA)

NCE Subsea, headquartered in Bergen/Norway is an industry initiative that works to strengthen and internationalize businesses, R&D and education in the field of operating, maintaining and modifying subsea equipment in order to recover more oil and gas from the reservoirs. The goal is to promote

further development of the Norwegian subsea industry by increasing innovation, following the belief that further investments in R&D will result in new products and services that can increase the market share.

NCE Subsea for example was a driving force in setting up the first Norwegian subsea specific engineering degree in 2007. The Bachelors programme in Underwater Technology – maintenance, modification, operation was established at Bergen University College, in close collaboration with regional industry. By 2009 this was the most difficult engineering degree to get into in Norway, which means really motivated students are coming into that. The programme is established at Bergen University campuses at Straume and also in Florø since 2013. In 2009 NCE Subsea also contributed to the establishment of a Master's programme in subsea technology.

Another example is the he Underwater Technology Conference, held annually in Bergen in June, which has become the most important meeting place for professionals in the subsea industry. It has a history of presenting highly competent speakers on current and important topics, and it is a great arena to build competence and share knowledge with your peers.

The main headline of the strategy is to increase the market share of the local businesses in the globally growing market, meaning to grow with a higher rate than the global market. Besides only dealing with the technological aspects as described above, other issues need to be addressed as well. The cluster organization therefore as well initiated a process of "social development" of the region.

Growth of the industry in the region requires highly-skilled personnel in high numbers. Only from the already existing population, these additional personnel cannot be made available. It is therefore necessary to increase the attractiveness of the region, the "quality of life" within the region: On the one hand, for young people to receive a high-level education locally and for them to not leave the region again after their graduation, one the other hand, for people being in the middle of their professional career, because the region does not only offer attractive jobs, but as well a broad and attractive cultural and social environment. International experts being attracted by interesting positions in science and research (academic) or by available top industrial positions will demand not only attractive professional opportunities but as well a well-functioning and attractive environment for their families.

The cluster organization successfully supported the initiation of higher education facilities including attractive positions for international academic personnel. Furthermore, they closely work with other regional institutions to further strengthen the cluster attractiveness and region attractiveness in particular.

Further information about **NCESubSEA** can be found at **www.ncesubsea.no**.

3.5   Effects of cluster organisations on SME development

The effects of cluster organisations on SME development through the provision of cluster services is difficult to measure as the economic development of a company depends on various variables that are a) difficult to measure and b) remain outside the influence capacity of the cluster management.

However, in the context of the cluster benchmarking an attempt was made to measure the effects by putting a self-assessment conducted by the cluster managers in terms of their perception of the effects their activities have on SME business activities into perspective with the spectrum and intensity of the business development services they deliver. The cluster managers were asked to rate the effects of their work on the business activities of SME on a scale from of 0 to 4, (where 0 is "no effects" and 4 is "significant effects on a large number of SME"). The spectrum and intensity of the business services were measured through a composite indicator combining relevant services.

Figure 19 presents the results of the analysis. Extreme values that appeared not to reflect the situation of a cluster organisation in an adequate way were not included in the analysis. Results of the analysis shows that most cluster managers claim that they yield only "moderate effects" or "significant effects on a reasonable number of SME".
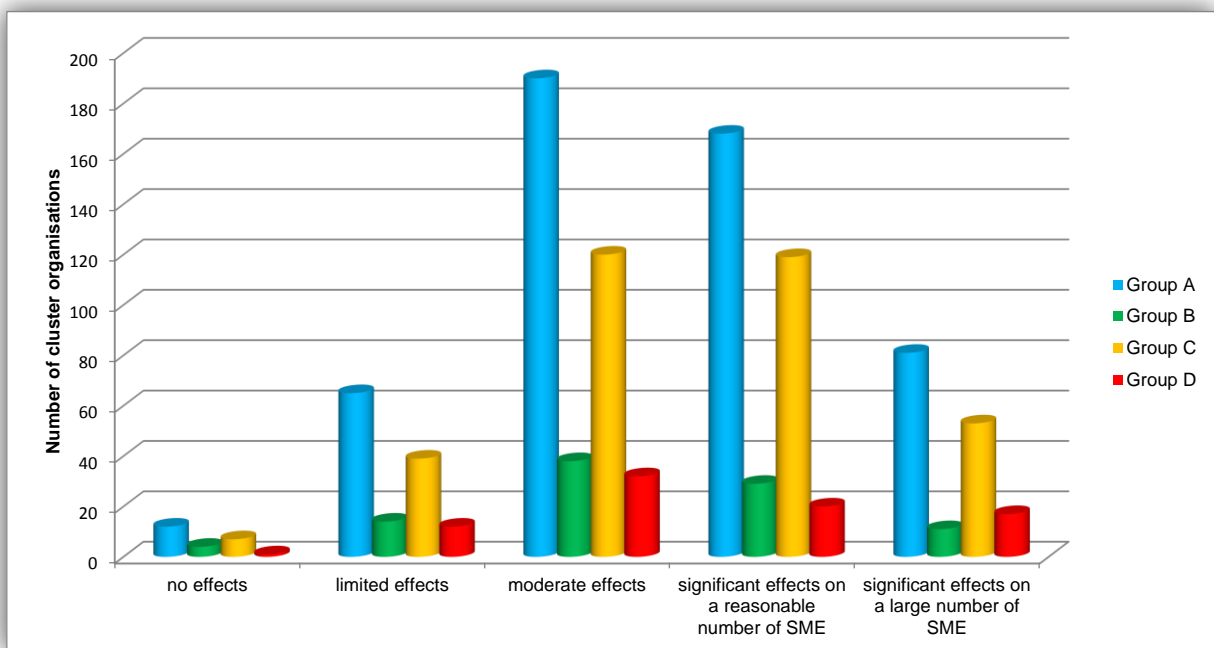

Figure 19: Effects of cluster organisations on business activities of SME

4   Conclusions

The labelling scheme of the European Cluster Excellence Initiative has received valuable support for its implementation through the European Secretariat for Cluster Analysis. This refers both to financial incentives for cluster organisations to make use of the audits through EU, national and regional programmes and to the political support that was provided by many policy makers, also from those who have not set up a specific programme. This support was key to the success of the scheme, which also reflects in a growing interest from overseas countries in using it as an instrument for the development of cluster management excellence.

For the further development in the context of the future EU cluster policy there are three conclusions drawn by ESCA in terms of the further conceptual development of the labelling scheme:

1. Reports that are provided to cluster organisations as a result of a Bronze, Silver and Gold assessment include recommendations on how to improve their management capacity. ESCA is often asked by cluster organisations to assist with practical advice on the implementation of improvement projects. Most of them are aware of the training offered by the European Foundation for Cluster Excellence. While appreciating this opportunity, they argue that they lack the time to participate in long-term courses and are rather looking for specific advice that is tailored to their individual situation (e. g. support with market analysis and/or strategy development). Further thoughts should therefore be spend on developing additional training opportunities.

2. The success of the labelling scheme depends on the "assessors on the ground". Assessors have to have a sound knowledge of cluster management which goes beyond a theoretical horizon. Cluster managers are expecting already in the moment of the benchmarking interview sound advice on management practice. This requires practical and convincing knowledge of the assessor that may either develop from working in cluster management or through a long consultancy track record. ESCA already maintains high standards for Gold and Bronze Label assessors. However, in particular for the Bronze label assessors who yet are not that familiar with cluster management practice a follow-up training or supervision should be offered. As this applies for many of the assessors who have been trained under recent EU-funded projects, the Commission should foresee corresponding budgets in upcoming calls. Such a measure would help to increase the acceptance of the labelling scheme among cluster managers.

3. Among the Gold-labelled cluster organisations a group of cluster managers has emerged who is ready to contribute actively to the further development of cluster policy in Europe. At the occasion of the meeting of the Cluster Excellence Expert Group in Linz on March 13th, 2014, this group expressed its interest to act as an advisory group to policy makers. Among the group members expressed a particular interest in playing a role in the context of a possible task force to explore interdisciplinary hidden markets or the development of industrial policy strategies.

Authors

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He started his career in 1999 at Betreuungsgesellschaft für Umweltfragen Dr. Poppe mbH where he was Deputy Head of the Euro Info Centre Kassel from 2002 – 2004. His area of work covered program advice for SME and policy advice to the European Commission. From 2003 to 2004 he was member of the Environment and Sustainable Development Working Group of the Euro Info Centre Network of the European Commission (DG Enterprise) in Brussels. Starting in January 2005 he continued his career as adviser for regional economic development programs at Rambøll Management Consulting, before he was hired by the Ministry of Economic Affairs and Labour of the German Federal State of Saxony in August 2006 where he was responsible for the development and implementation of vocational training programs to support both education and economic development policies. From October 2008 to August 2010 he served as technical advisor for international cooperation and innovation policies as well as trainer for program development at the Department of Science and Technology of the Republic of South Africa, based in Pretoria. In August 2010 he joined VDI/VDE Innovation + Technik GmbH. He is member of an advisory group on SME financing for the Federal Ministry of Economy and Energy (BMWi).

Helmut Kergel graduated from the Technical University of Berlin in 1986 (Diplom-Ingenieur) in precision engineering. Today, he is deputy head of the department "International Technology Cooperation and Cluster" and programme director "Global Innovation" of VDI/VDE Innovation + Technik GmbH (VDI/VDE-IT). Besides being involved in the management, coordination and evaluation of collaborative innovation projects on national and EU level, he is also responsible for a number of international innovation consulting and training projects in several overseas countries. Helmut was responsible for several evaluation activities of European R&D co-operation, e.g. as project director for "EVIMP2" (Impact and exploitation assessment of finished projects of the GROWTH Programme, Key Action 1 – Innovative Products, Processes, Services, (2004-2008) and "WING - Watching IST Innovation and Knowledge", evaluation of the domain "Intelligent Manufacturing Systems IMS" (2006), and he was coordinator of collaborative projects co-financed by the European Commission (Thematic Network "Adhesives in Electronics", 1998-2002 and Integrated Project "Intelligent Logistics for Innovative Product Technologies", 2004-2008). Helmut Kergel was significantly involved in the development of indicators and processes for assessing cluster management quality and benchmarking methodologies in the context of the German programme "Kompetenznetze Deutschland" (2008-2012), the pan-European project "NGPExcellence" (2010-2011), and the "European Cluster Excellence Initiative (ECEI)" (2009-2012). Since end of 2011, he is appointed as director of the "European Secretariat for Cluster Analysis (ESCA)".

Michael Nerger is special advisor at the European Secretariat for Cluster Analysis. Working with ESCA from its very beginning he is responsible for the statistical evaluation of cluster data. Michael has been also working as Bronze and Gold label assessor.

From 2007 to 2010 he underwent his vocational education in the department "Economy and Society" of VDI/VDE Innovation + Technik GmbH (VDI/VDE-IT) for becoming a certified assistant for market and social research. Since 2010 he is member of the department "International Technology Cooperation and Clusters". In parallel to his work he studies Business Economics and Social Psychology. Michael is competent in the areas of designing online surveys using IBM SPSS DataCollection, the analysis with IBM SPSS Statistics, and the visualization of survey data in various graphical formats (ESRI ArcGIS, SmartDraw, MS Excel). With these competences he contributed to several projects and studies, assessing, analyzing and visualizing market and other statistic data. In the context of the European Secretariat for Cluster Analysis (ESCA), Michael is responsible for the design, maintenance, and analysis of the cluster benchmarking data and selected administrative issues. He was also involved in the design of ANIS (Indicator-based Analysis of National Innovation Systems), a tool developed and used by the Institute for Innovation and Technology for screening and assessing the innovation capabilities of developing countries and regions.