FP6-022551

NICE

NETWORKING ICT CLUSTERS IN EUROPE

Coordinated Action
Research and Innovation

Final Activity Report

Period covered:	22.11.2006 – 21.09.2008	Date of preparation:	01/10/2008
Start date of project	22/11/2005	Duration:	34 month
Project coordinator:	Institute for Work and Technology	Revision:	Final V1.0

The final activity report documents the objectives and most important results of the NICE project. It illustrates the consortium's proceeding and the methodologies applied and the project's achievements. According to the project rational, the report addresses likewise cluster management organisations, policymakers at EU, national and regional level as well as ICT companies.

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Content

1 Executive Summary

NICE aimed at strengthening the European ICT sector by facilitating the growth of networking clusters, sourcing the skills and experience of successful businesses to guide the creation of new jobs and help develop innovative business ideas. According to the project rational the project addressed likewise the improvement of cluster management practices and networking ICT SMEs. Building on the experiences gained from the project, as well as from regional, national and EU cluster policies and through the exchange within Europe INNOVA network policy recommendations were formulated to improve future cluster policies.

With regard to clusters and cluster management the outcomes of NICE illustrate that excellence is not only a key to further strengthening competitiveness in the EU, but is also crucial to unfold the full potential of clustering. In this regard, transnational cluster co-operation fertilises learning processes and thereby furthers efficient and professional cluster management. The lessons learnt can be summarised as follows:

Cluster & Cluster Management

- It is people and their interactions not the underlying concept which make a difference in cluster performance.

- Striving for excellence requires the adoption of more professional approaches in terms of strategic orientation and monitoring.

- Networking ICT clusters across Europe and cross-clustering are crucial for the future competitiveness of the sector.

- A solid, truthfully and open atmosphere opens new for trans-national cluster and entrepreneurial cooperation and, thus strengthens clusters' competitiveness.
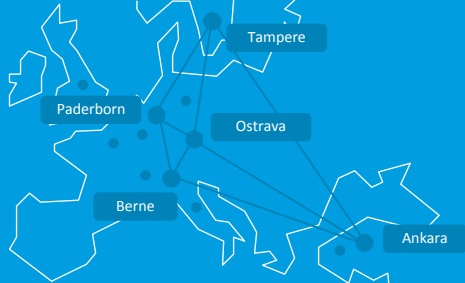
Another major effort of the project was to support cooperation between ICT companies across Europe by bringing together industry-leading actors and small and medium-sized companies to network, collaborate, exchange experience and expertise, learn from each other and exploit synergies.

Transnational business cooperation

In the framework of NICE business matchmaking has proven to be a successful instrument in supporting SMEs internationalisation efforts by simplifying entrepreneurs' access to information about new business opportunities. Considering different business cultures and risk taking attitudes, one had to come up with a highly attractive program both, in terms of contents and social activities. Following this notion the workshop programmes combined company/solution presentations, pre-arranged one-on-one meetings allowing qualified time with preferred partners, virtual matchmaking and site visits to highly attractive companies.

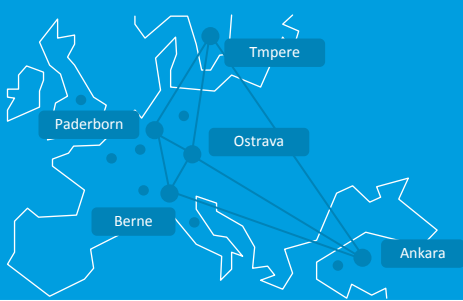*Supporting SMEs' internationalisation efforts*

To the Point

_ Five regional cluster studies covering Ankara, Berne, Ostrava, Paderborn and Tampere were conducted. They provide insight in the regional ICT sector, the clusters' evolution and structure as well as regional and national cluster policies. The results were consolidated in a comparative cluster study.

_ Three cluster management workshops which dealt with the topics «Evaluation & Monitoring», «Supporting SMEs to go global» and «Business-University-Government Collaboration» took place and attracted more than 100 participants.

_ The applicability of the balanced scorecard as instrument for strategic cluster management was successful tested with IT Cluster Ostrava, Czech Republic.

_ Five international business matchmaking events attracted more than 190 SMEs. Approximately 50 pre-arranged entrepreneurial one-2-one meetings took place and some 15 of which have been or are in process of joint business. The cooperation activities range from informal exchange and joint projects to opening new branches.
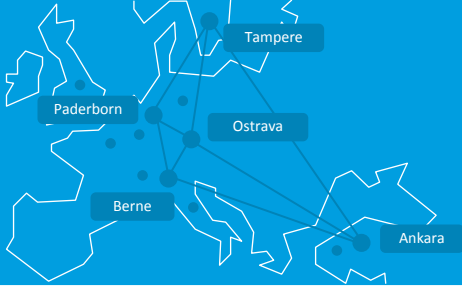
— The NICE findings were consolidated in a concise set of policy recommendations addressing EU, national and regional policymaker as well as cluster management organisations.
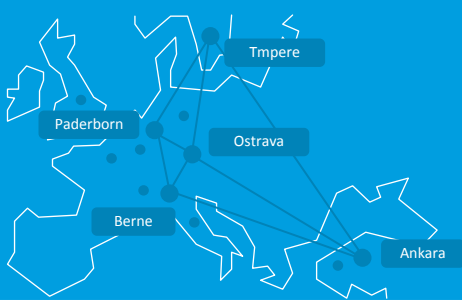
2 Project Execution

During recent years clusters have attracted more and more attention from policymakers in their quest to improve regional competitiveness. Clusters are predominately a market-driven phenomenon. While most successful clusters emanate as a result of self-organised bottom-up processes, market forces or simply by chance, others are inspired and mainly financed through national and regional cluster programmes. In this respect, cluster initiatives aim at activating synergetic potential by initiating self-organisation. Today, cluster and cluster policies stand for efficient, self-organised, spatially rooted economic processes and for a competitive model which goes beyond cost-cutting and mass production. Clusters have become a key element in tackling the challenges of knowledge society and globalisation in Europe. Although clusters are not new phenomena, their advantages for boosting countries' and regions' competitiveness has been put under the spotlight and influenced policy thinking.

Breakthrough of the cluster concept

1.1   Strategic Objectives

Following this notion NICE – Networking ICT Clusters in Europe aimed at strengthening the European ICT sector by networking clusters, having in mind that business clusters are the focal points for the creation of new jobs and a breeding ground for innovative business ideas. The creation of an innovative-friendly environment throughout the EU, and the stimulation of innovation is crucial for company formation and competitiveness and thus, for the development of high quality, lasting employment and sustainable economic growth. Networking and exchange of experience support the process of innovation and the transfer of «excellence»; tools and activities can be successfully fostered through co-operation at the European level. Being embedded in an innovative-friendly environment, exchanging knowledge with suppliers, customers as well as competitors and having strong connections with universities, research institutes and regional authorities is the ideal precondition for success. These «nodes» within a sector, defined as clusters, are considered as one of the driving forces in innovation processes. A further

Clusters as focal points in Europe's innovation framework

aspect which was taken into account is the Lisbon Strategy which aims at making the European Union *"the most dynamic and competitive knowledge-based economy in the world"* by 2010. Information and communication technologies (ICT) were identified as playing a key role in achieving the main objectives of the strategy. Next to the permeation of ICT throughout society there is the need to step up investments and innovation in ICT sector itself.

Against this background NICE strived to bridge the gap between regions with a highly innovative business environment, due to ICT innovations and clusters, and those less advanced regions. Therefore, NICE aimed at supporting networking, cooperation, transfer of knowledge and the initiation of joint projects. Core questions were how to build and maintain an innovative environment in the regions, and what are the key success factors for prosperous clusters? To answer these questions NICE intended

_ To boost innovations in the ICT sector in Europe by bringing together actors from prosperous clusters to network, collaborate, exchange experiences and expertise, learn from each other and exploit synergies;

_ To obtain new knowledge on innovations in the ICT sector and clusters, their success factors and barriers;

_ To establish joint projects and business strategies among the participating clusters;

_ To support the transfer of knowledge less advanced cluster regions and, to help building up a long standing network of ICT clusters in Europe.

The project consortium was comprised of 11 partners from 5 countries and embraced cluster management organizations, regional development agencies, research organizations, ICT companies and a science park.

NICE project consortium

Institute for Work and Technology
Gelsenkirchen, Germany
(Coordinator)

Wirtschaftsförderung Paderborn GmbH
Paderborn, Germany

codex GmbH
Paderborn, Germany

Technology Centre Hermia
Tampere, Finland

Tampere University of Technology
Tampere, Finland

Oy Tawasta OS Technologies Ltd.
Hämeelinna, Finland
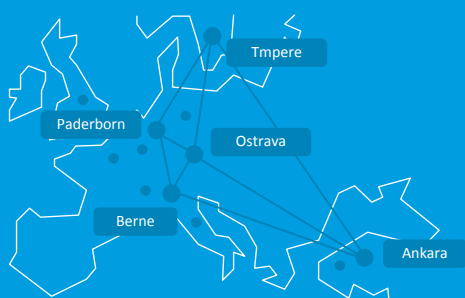
ODTU Teknokent |METU Technopolis
Ankara, Turkey

Regional Development Agency *Ostrava*
Ostrava, Czech Republic

2.1 Project Rational

NICE addressed three different, closely related levels: (1) the cluster and its management, (2) the sector and (3) cluster policies. The related activities focused on different spatial levels, namely the region, the country and the European Economic Area.

Figure 1: NICE – Project Rational
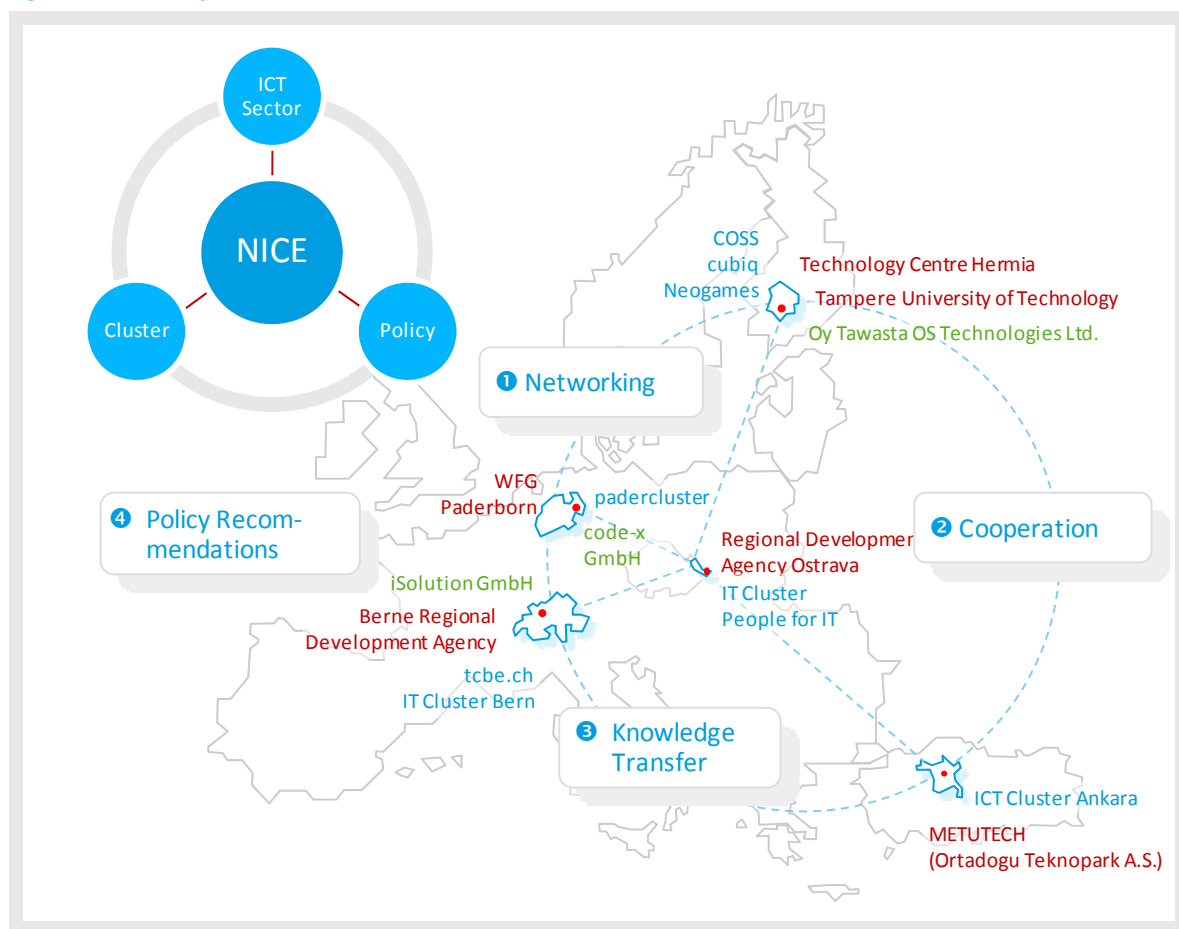
The implementation plan with its methodology and its roadmap reflected the objectives of NICE: Firstly, it focused on the support of co-operation between advanced ICT clusters in Europe to create synergies, which ideally abet innovations. And secondly, it centred on the exchange and transfer of good practice to associated countries and new member states.
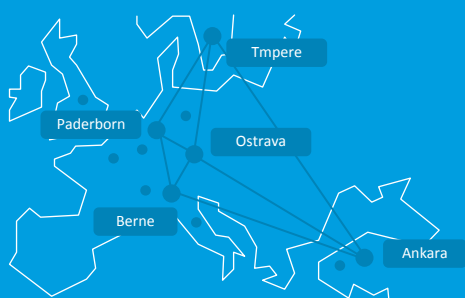
Phase 1 - Joint Framework: The initial phase of the project (12/2005 – 05/2006) aimed at developing a mutual understanding of the ICT sector and its value chain. Analyses on the clusters, regions and ICT market conditions were conducted based on a common analysis grid and were comprised in a comparative cluster analysis.

Phase 2 – Cluster Management Networking: The exchange of experience and knowledge to support cross-regional learning, to identify good practice in cluster management and to initiate an ICT cluster management network at European scale took centre stage during the second phase (06/2006 – 06/2007). Three thematic cluster management workshops were carried out in Berne, Paderborn and Tampere on the topics «Monitoring & Evaluation of Cluster Management», «Supporting SMEs in going Global» and «Business, University and Government Collaboration».
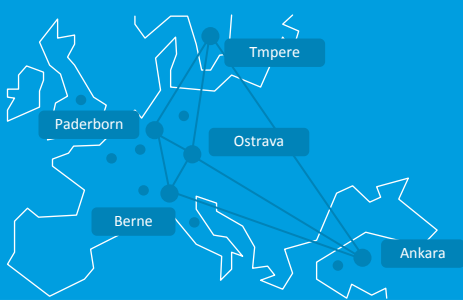

Phase 3 – Business Networking: The third phase aimed at entrepreneurial networking to initiate task forces, joint projects or initiatives among ICT SMEs in Europe (02/2007 – 11/2007). The objective was to initiate task forces, interest groups and joint projects among the companies to pave the way for future business collaboration. Three business networking workshop on the topics «RFID, Logistics, Procurement, eBusiness and Business Services», «Mobile Technologies & Open Source Solutions» and «10 Golden Rules …» took place. The events afforded the opportunity of pre-arranged one-2-one meetings which resulted in lively business relationships.

Phase 4 – Transfer & Learning: The final project term (12/2007 – 09/2008) was originally planned for transfer of cluster management models and good practices to the less advanced ICT cluster regions, to support their future development. These activities already took place during the previous phases. Thus, the concept was modified insofar as cluster management issues were only addressed subsidiary, whereas business networking took centre stage. Furthermore, the experiences made and insights gained during the project term led to the formulation of policy recommendations on regional, national and European level.

2.2 Achievements & Lesson learnt

The activities carried out during the project term affected the clusters and their management, ICT companies and other regional stakeholders such as policymakers, networks and economic development agencies. The insights gained, lessons learnt and impacts are summarised in the following chapters.

2.2.1 Clusters & Cluster Management

With clusters gaining momentum as instrument for regional economic development, cluster organisations as provider of specialised services to companies in the cluster attain greater importance. According to the European Commission, more than 500 cluster organisations are estimated to exist, with different organisational structures, tasks and resources. However, the level of quality and professionalism varies largely across Europe.

Cluster organisations as service providers

Moreover, the perception of cluster management varies greatly across Europe. In some countries and regions cluster management is increasingly recognised as a new profession whereas in others it is not. In general, cluster management is a long-term process. Continuous learning and capacity building are crucial in adapting cluster management practices to changing framework conditions. Against this background no blue print for successful cluster management or one-size-fits-all model exists. Handbooks and manuals for cluster management provide a good first orientation, but are by no means enough. What is required is investment in people leading ideally to the provision of better services – that is capacity building. In certain terms, capacity building results from learning-by-doing as well as the exchange of knowledge and experiences.

Perception of cluster management

In this respect trans-national cooperation gains in importance not only to learn from each other but also to form partnerships between different clusters. That is were NICE comes into play. By bringing together a group of 5 ICT Clusters from around Europe, each of which at a different stage of the cluster life cycle, knowledge and expertise could be pooled, transferred and shared in a manner

Trans-national cluster co-operation
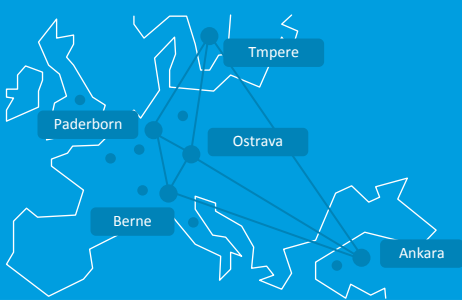
which ultimately leads to innovations and further cluster growth and development.
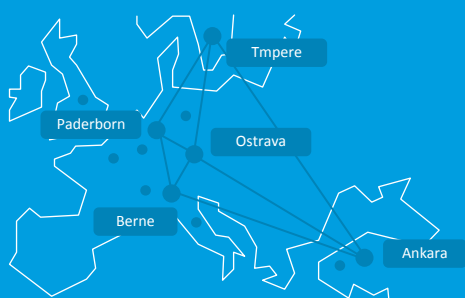
Figure 2: Activities to improve cluster management practices
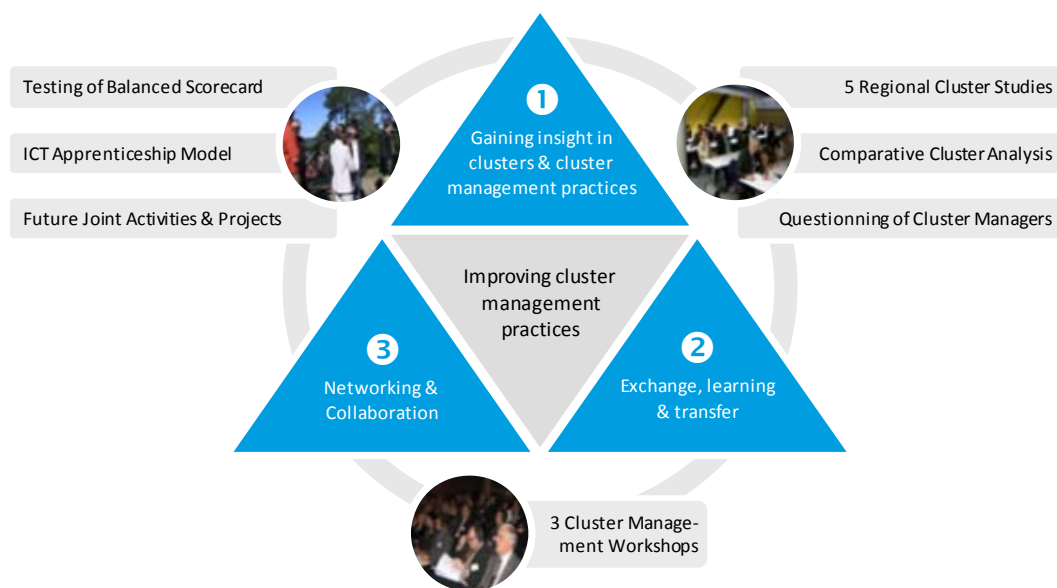
As figure 2 illustrates, five regional cluster studies, a comparative cluster analysis and the questioning of 100 cluster managers across Europe formed the starting point. The results shed light on the current state of cluster management and can be summarised as follows:

_ An organisational shift from the single cluster manager to a cluster management team takes place (Figure 3).

_ In the 1990s, when the first wave of cluster initiatives and programmes was launched, the majority of cluster managers had an administrative background. Today, the majority is from either economist or engineer background and has worked in the private sector or in technology management (Figure 4).

_ There is a clear tendency to standardisation particularly in regard to cluster managers' job profiles (Figure 5). The results indicate that a repository of common cluster management activities exists.

Gaining insight in clusters and cluster management

— As a result of informal processes such as dense communication and networking, rather than of formal standardisation, a common understanding of cluster management has evolved over of the last ten years.

Figure 3: Number of full-time employees

more than 5 employees
26%

less than 1 employee
31%

15%
2 - 4.5 employees

28%
1 - 2.5 employees
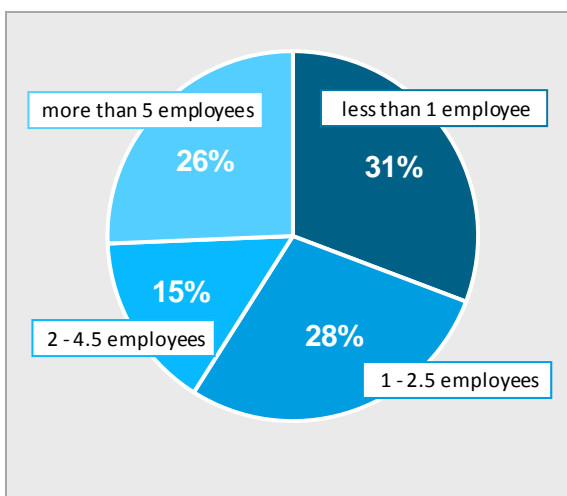
Figure 4: Cluster managers' educational background

Engineering
35%

Business Administration
25%

4% Geography

20%
Economics

16%
Social Science
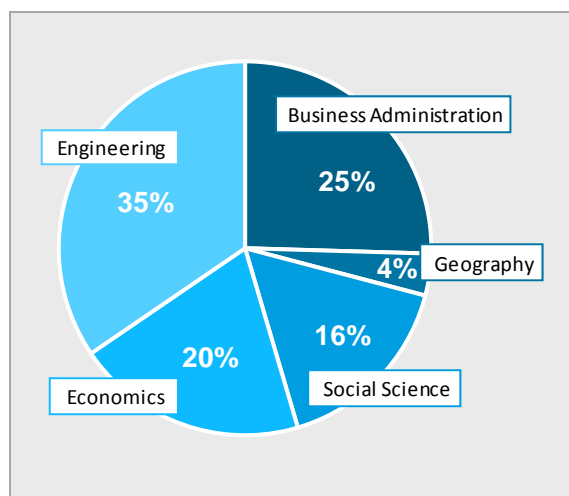
Figure 5: Cluster management – fields of activities by sector group

1= not at all   2 = infrequent   3 = planned   4 = regular   5 = daily

Legend:
- Hightech sectors (nano, biotech)
- Growth sectors (health care, energie, environment)
- ICT
- Mature industries (automobile, chemistry)

X-axis categories: Events, Workshops etc.; Qualification; Fostering cooperation; Fostering R&D cooperation; Acquisition; Consultation of start-ups; Internationalisation; Infrastructure; Technology-transfer; Market observation; Lobbying; Cluster promotion; Monitoring

With regard to trans-national co-operation, clusters' histories show to be an important influencing factor. While bottom-up cluster initiatives tend to be highly engaged in international networks, political clusters and hub-and-spoke clusters are less internationalised.

Based on the results of the analyses three major challenges to further improve cluster management and to sustain clusters were identified:

‒ To raise the quality of cluster management;

‒ To enhance and unfold clusters innovation potential;
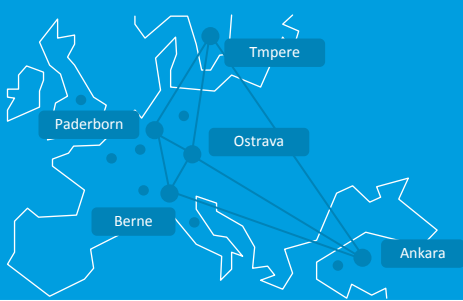
‒ To support ICT SMEs competitiveness.

The aforementioned challenges were addressed in three cluster management workshops on the topics «Monitoring & Evaluation», «Supporting SMEs to go global» and «Business-University-Government Co-operation». The events attract more than 100 cluster managers, policymakers and regional stakeholders.

Cluster management workshops: Exchange of experiences and knowledge

The outcomes of the workshops illustrate that excellence is not only a key to further strengthening competitiveness in the EU, but is crucial to unfold the full potential of clustering. In this regard, transnational cluster cooperation fertilises learning processes and thus, furthers efficient and professional cluster management. The lessons learnt can be summarised as follows:

*Excellence as key driver for clusters' sustainability*

‒ It is people and their interactions not the underlying concept which make a difference in cluster performance.

‒ Striving for excellence requires the adoption of more professional approaches in terms of strategic orientation and monitoring.

‒ Networking ICT clusters across Europe and cross-clustering are crucial for the future competitiveness of the sector.

___ A solid, truthfully and open atmosphere opens new paths for trans-national cluster and entrepreneurial cooperation and, thus strengthens clusters' competitiveness.

Creating strong linkages can lead to valuable learning processes as the example IT Cluster Ostrava illustrates: In 2005 when NICE started IT Cluster Ostrava was in its evolutionary stage, the number of members was small and interactions mainly characterised by competition. As the following figure shows during the project term a major shift took place: While the competitive relationships declined and the number cooperative actions increased.

Figure 6: ICT Cluster Ostrava – Relationships between cluster members
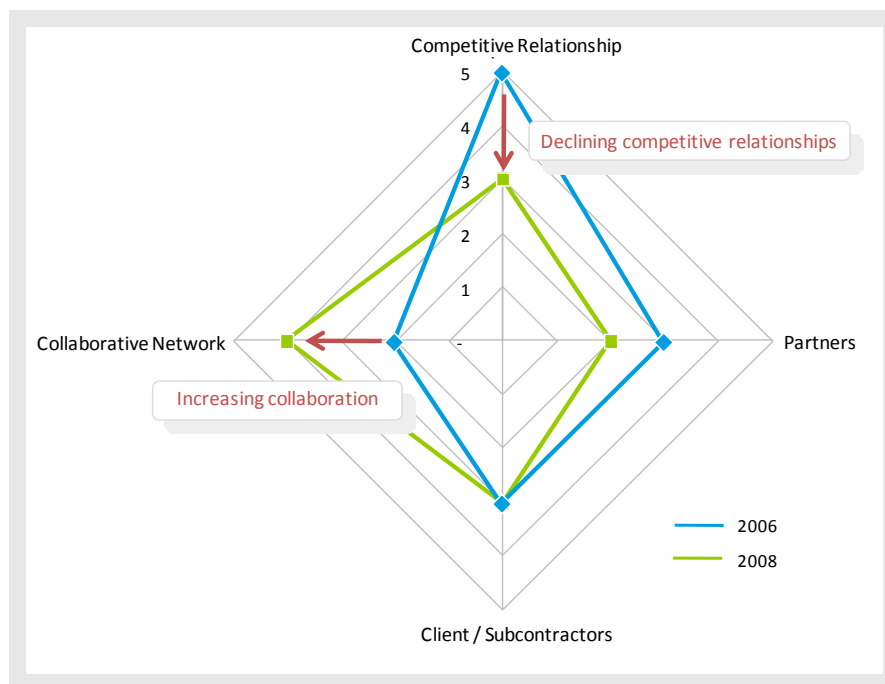
Of course this development is to a large extent result of the efforts undertaken by the regional actors. However, NICE has significantly contributed by developing a balanced scorecard with the stakeholders and through knowledge exchange.

Next to the direct impacts the cluster management workshops contributed to a broader awareness concerning the relevance of clusters, professional cluster management, and trans-national cooperation for regions competitiveness.

For example, code-x, one of the entrepreneurial partners in NICE initiated the company-driven ICT mini-cluster ITMW e.V. in Paderborn region. Based on the knowledge on cluster management acquired through the cluster management workshops, they engaged a part-time cluster manager, who is financed through membership fees.

*Launch of an entrepreneur-driven mini-cluster*

Further on, NICE was used by the Tampere University of Technology as an example of EU projects in the field of ICT at all levels of teaching ranging from bachelor to master and post-graduate levels. Thus, the project has contributed to raise awareness of students regarding EU projects in general as well as it has shown the wide array of possibilities created by this kind of trans-national collaboration and networking project. The project had a similar effect on the participants of further educational courses provided by the University, e.g. the lecture «Professional Development Programme of Software Industry Managers».

Feedback into higher and further education

The transfer of the Swiss «ICT Apprenticeship Model» to Ostrava is another side effect. When testing the balanced scorecard in Ostrava it became evident that the region lacks ICT specialists at all educational levels existed. Vocational education and especially the apprenticeship (currently integrated in secondary school) were not well-established and thus, needed improvement to cover the short-term needs. As Berne region and especially TCBE was one of the key actors in establishing the nationwide apprenticeship in Switzerland they had in depth knowledge on the development and implementation of such model and provided ICT Cluster Ostrava with the necessary information.

Transfer of the Swiss ICT apprenticeship model

Next to the outlined impacts the active participation in the Europe INNOVA initiative contributed to the success of NICE. The annual partnering events which allowed a cross-project exchange of experiences and knowledge at European level as well as the Europe INNOVA conferences provided significant input.
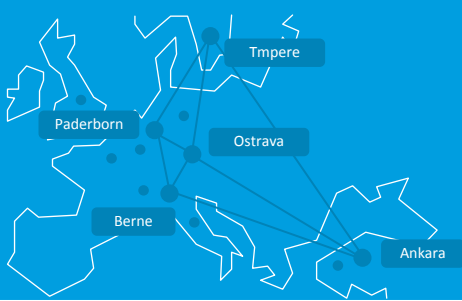
With regard to awareness raising the Europe INNOVA cluster awards were valuable. NICE partners where nominated as «Clusterpreneuer of the Year» (Timo Vähliharju, Mediamaisteri Group, Finland) and «Network of the Year» (Judith Terstriep, Institut for Work and Technology) and won the price as «Cluster Manager of the Year» (Christoph Beer, tcbe.ch – IT Cluster Bern).

Summing up, the direct and indirect impacts of the cluster management workshops as well as the related discussions and established links outbalanced the expectations. The open exchange has generated considerable learning in both directions, from advanced to less advanced cluster regions and vice versa. It was not showcasing, but bringing people together and letting them discuss common problems and potential solutions what really added value to the partnership.

2.2.2   Networking ICT SMEs

Another major effort of the project was to support cooperation between ICT companies across Europe by bringing together industry-leading actors and small and medium-sized companies to network, collaborate, exchange experience and expertise, learn from each other and exploit synergies. The idea behind this was twofold: First, globalisation is reshaping the economic environment for small and medium-sized enterprises (SMEs). Second, innovation as key driver for the future competitiveness of European ICT companies seldom occurs in a nutshell. To date, innovation is characterised as a complex set of interactions of companies, universities and research centres, markets and society. Moreover, innovation dynamics are not only supplier-driven, but also customer-driven. Concepts such as «Open Innovation» take into account that in a world of widely distributed knowledge companies cannot afford to rely entirely on their own research, but should instead interact with other agents and communities to exchange ideas. Consumer participation (i.e. lead users) and open collaboration are gaining in importance and foster innovation. More than ever, SMEs depend on networks, formal and informal linkages in and beyond their home region to unfold their full innovation potential.

Fostering SMEs innovation capacity through trans-national co-operation
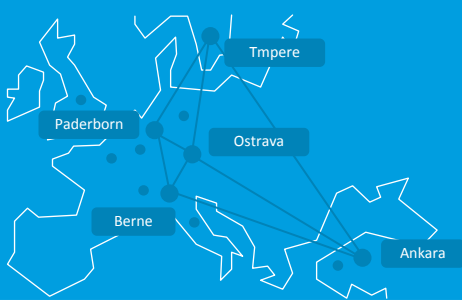
However, assuming that inventiveness, agility and flexibility – qualities traditionally assigned to SMEs – are required and rewarded under these framework conditions SMEs are in the position not only to tackle globalisation but embrace it and to profit from it. The question is how European SMEs can transform globalisation to their advantage.

In the framework of NICE business matchmaking has proven to be a successful instrument in supporting SMEs internationalisation efforts by simplifying entre-preneurs' access to information about new business opportunities and thus, to further their innovation capacities. Considering different business cultures and risk taking attitudes, one had to come up with a highly attractive program both, in terms of contents and social activities. Following this notion the workshop programmes combined company/solution presentations, pre-arranged one-on-one meetings allowing qualified time with preferred partners, virtual matchmaking and site visits to highly attractive companies (see Figure 7).

Matchmaking as an instrument to further business collaboration

Figure 7: NICE's Concept of Business Networking
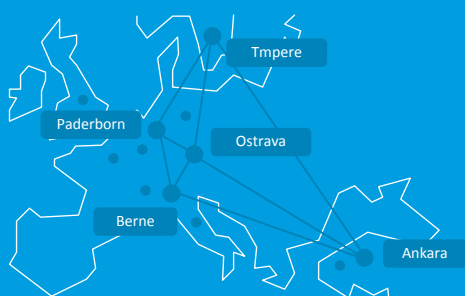
The selection of the event themes were based on the clusters' specialisation in reconciliation of companies interests. Due to the involvement of companies in the organisation of the events it was assured that they are committed to the events. The themes covered are:

_ RFID, Logistics, Procurement, e-Government and Business Services

_ Wireless Technologies and Open Source Solutions

_ IT for Public Sector

_ People for IT – Education, Training and Incubation

_ Breakthroughs in Turkish ICT Industry (focus on disaster management and defense solutions)

The comparison of the planned and actual outcomes of business networking activities illustrates the success of the applied concept:

Table 1: Planned and actual activities and outcomes

Activities/Results	Planned	Actual
Networking events	3	5
Joint projects, task forces or interest groups	3	15
Number of associated SMEs	Not specified	1,600
Number of participating SMEs	Not specified	approx. 190
Pre-arranged one-to-one business meetings	None	more than 50
Site visits	None	15
Market entry with a joint product	None	1
Others	None	Opening of a RFID competence centre

The participating companies welcomed the open and honest atmosphere during the matchmaking events which paved the way for future joint business activities.

« *Based on the belief that clusters create manifold benefits for SMEs we see ourselves as 'clusterpreneur' that actively promotes the cluster and the idea behind it.* »

Timo Väliharju
CEO, Mediamaisteri Group FI-Tampere

« *The exchange between Western and Eastern European countries was very successful and beneficiary with regard to future business activities.* »

Josua Regez
CEO, Isolutions AG, CH-Berne

«*The reality has overcome my expectations! Through NICE we got the opportunity to meets these firms personally and to launch our co-operation.* »

Radek Dybal
Sales Director, 3DSoft, CZ-Ostrava

« *The matchmaking events full paid off only by the pre-arranged one-to-one meetings.* »

*Manfred Faulhaber*
CEO, StageX, D-Germany

« *Although there are many events a company can join to seek future business opportunities and to widen its prospects, the NICE workshop has been a very beneficial event not only for the relevance of the business contacts, but also the business-friendly atmosphere set up by the NICE project partners.* »

M. Ali Turker
CEO, Sebit LLC., TR-Ankara

Against the background that some of the business talks and outcomes are confidential only a selected number of case studies were documented in the report on business networking. In order to consistently document the non-confidential cases a survey grid was developed to get insight in the objectives, types and current status of the cooperation, the cooperation intensity, the position in the value network and its value preposition. Moreover, bottlenecks and pitfalls, outcomes and future perspectives were collected. The necessary information was collected by questionnaire and telephone interviews from the parties involved.
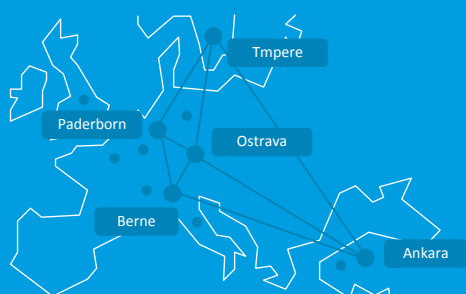
Figure 8: Joint business activities
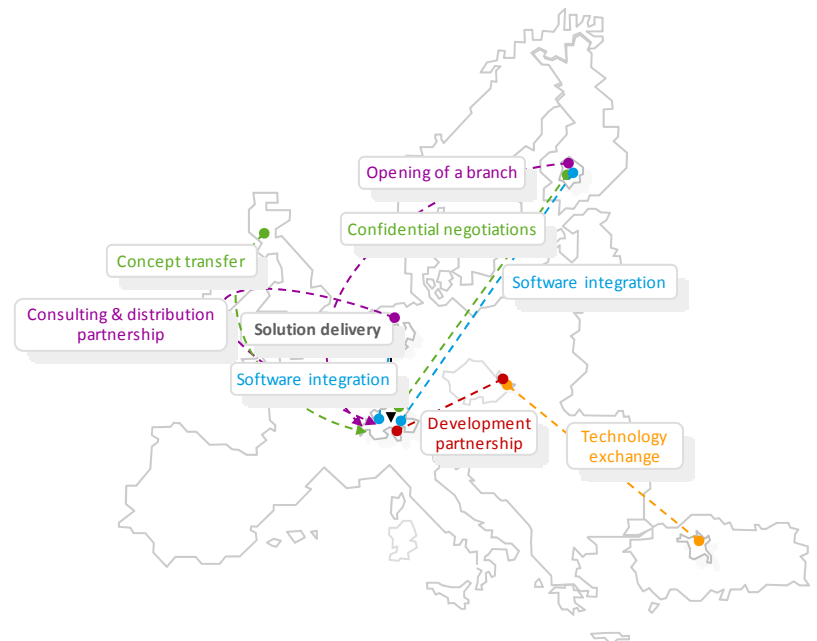
Figure 9 illustrates the companies self-assessment on the efforts made in relation to the type of cooperation. Referring to the latter the four categories «Informal Talks», «Joint Project», «Joint Venture» and «Joint cooperation» and intermediate levels were defined. The results indicate that the efforts made not necessarily lead to a successful co-operation.

Figure 9: Business Networking – Companies self-assessment
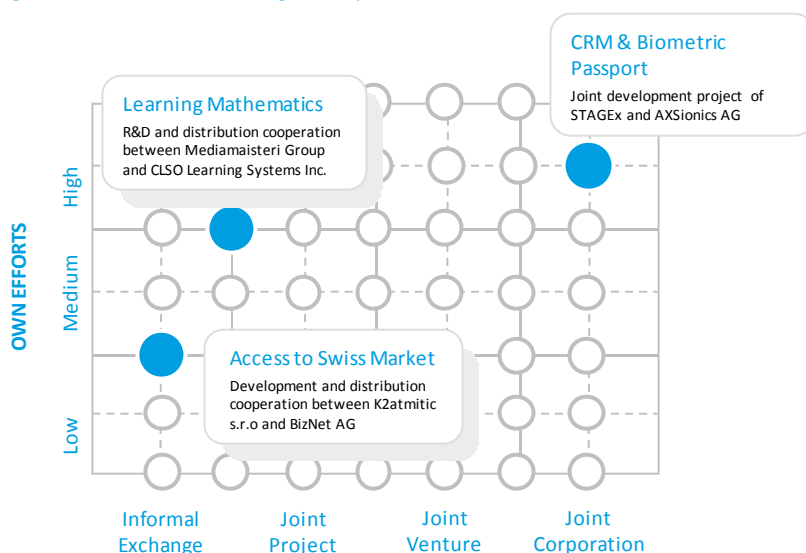
A good example in relation to innovation is a joint project between STAGEx, a Paderborn-based business solution provider and AXSionics AG, a Berne-based secure e-access solution provider. The co-operation objectives can be summarised as follows: STAGEx delivers web-based databases for business case management. In times of online fraud caused by identity theft, e-security is a major selling argument. Thus, STAGEx was searching for security solutions which could be integrated in their business case management system. Such solutions had to combine specific criteria, such as transmission speed and practicability at an affordable price with maximum security. In return, AXSionis was seeking a business application for their e-security solution in which the advantages of their biometric passport system could be presented to clients. Both partners benefit from the co-operation. The «new» integrated solution is highly interesting to STAGEx customers because the integration of biometric authentication and web-based business case management is unique. In turn,

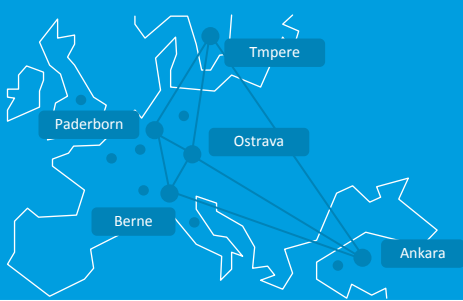*Case study: CRM & Biometric Passport*
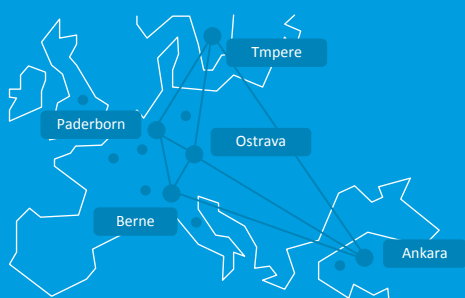
AXSionics can now demonstrate its biometric passport under real time conditions. Through the joint development project both partners were able to strengthen their individual brands and thus, their competitive advantage.

Berne-based CLSO-Learning Systems Inc. is a primary grades Math content company which relies on a very strong pedagogical approach called «visual scaffolding». Based on over 2 decades of experience in remedial education CLSO proposes a «frictionless learning» paradigm for basic mathematics concepts. The visual scaffolding approach particularly suits SEBIT's pedagogical approaches in using rich multimedia content for delivering K-12 curriculum subjects including mathematics. The product lines of the two companies seemed to share a pedagogical common ground. Nevertheless SEBIT K-12 curriculum coverage is particularly weak for early primary grades. Therefore, the partners agreed to join forces to include CLSO-Learning Systems content in the SEBIT portfolio through licensing. As a follow-up SEBIT will analyse the multimedia quality of CLSO content and will run a feasibility study on implementing it with rich multimedia technologies. In turn, CLSO will examine the market strategy and penetration of SEBIT in various countries and see if it matches with their growth strategy.

Case study: Sebit LLC & CLSO-Learning Systems Inc.

Conclusions

In summary, the commitment and enthusiasm of the companies and cluster managers involved in the business matchmaking provided opportunities to develop common initiatives, and contribute to the opening of new routes for transnational entrepreneurial networking. The experiences in NICE demonstrate that ICT SMEs opt to strengthen their innovative capabilities and to internationalise if they get the chance. However, companies' capabilities to successfully internationalise vary, and so does their culture and «risk-taking» behaviour. Most SMEs are aware of the need for innovation as key driver for their future competitiveness. They know that they depend, more than ever, on networks, formal and informal linkages in and beyond their home region to unfold their full innovation potential. However, this knowledge does not necessarily lead to an internationalisation strategy as core element of the

business strategy. But the contrary, many SMEs remain focused on their national markets.

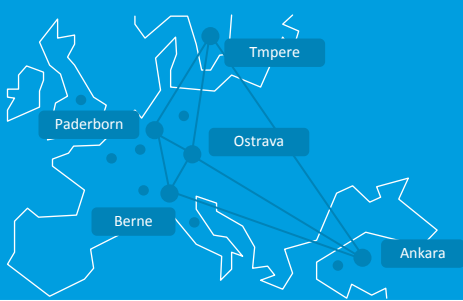The key lessons learnt can be summarised as follows:

_ Despite the advantages of embracing globalisation and the risk of not doing so many European SMEs remain focused on their national markets.

_ According to the last data by the Observatory of SMEs only 8% of SMEs are involved in exports, only 12% of SME inputs are purchased abroad and only 5% of EU SMEs obtain income from foreign business partnerships.

_ In the term of NICE 5 business matchmaking events in five countries took place and attracted more than 190 ICT SMEs.

_ ICT SMEs opt to strengthen their innovative capabilities and to internationalise the business activities if they get the chance.

_ Supporting SMEs in their cross-border networking activities needs time. Social networking, trust-building, and «door openers» are crucial. And many SMEs would not consider internationalisation if it were not because of support.

The main factors hindering SMEs internationalisation concern

1. Insufficient managerial time and/or skills required for internationalisation;
2. A lack of financial resources;
3. A lack of knowledge of foreign markets, mostly consequence of the previous two aspects

Accordingly, successful and sustainable internationalisation requires a related strategy and the acquisition of the necessary capacities, abilities and resources prior to the first step of internationalisation. Management skills and long-term availability of human resources in order to develop an internationalisation strategy without compromising the day-to-day business is crucial.

Successful internationalisation requires an adequate strategy

Although cluster management organisations cannot directly influence their members innovation capacities they can develop support mechanisms and services which might positively impair companies' capacities. Such services concern likewise capacity building and access to foreign markets. For example, the quality and intensity of network interactions within and beyond the cluster, with customers, distributors and suppliers and research organisations is typically associated with better performance. Accordingly, cluster management organisations should support SMEs to strengthen these links through matchmaking, cross-clustering and in their role as «boundary spanners».

*What cluster management organisations can do?*

2.2.3   Policy Recommendations

The results of NICE and other Europe INNOVA projects show that networking and sharing of experience and knowledge supports the process of innovation and that transfer of methodologies, tools and activities can be successfully fostered through co-operation at the European level. Being embedded in a fertile business environment which offers the opportunity to collaborate with research institutions, suppliers, customers and competitors as well as regional authorities located in the same geographical area is crucial for companies, especially SMEs.

Clusters' role in a broader concept of competitiveness

Clusters shows wide variations over regions and sectors, however today they clusters stand for

_ the idea that regions are not inevitable victims of globalisation, but can influence and shape their own fate;

_ competitive advantages as a result of knowledge exchange, qualified labour forces and a fertile business environment;

_ the experience that networking and co-operation can strengthen the innovative capacity of regions and enterprises, especially SMEs;

_ a balance of competition and co-operation which leads to synergies in a catalytic way.
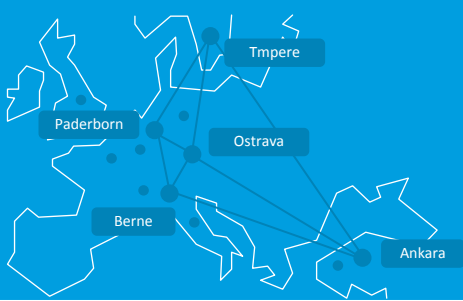
Accordingly, cluster and cluster policies stand for efficient, self-organised, spatially-rooted economic processes and for a competitive model which goes beyond cost-cutting and mass production. Clusters are a key element in tackling the challenges of knowledge society and globalisation in Europe.

Clusters have become an important concern for policymakers at European, national and regional level and cluster policies have been adopted around the world despite the lack of a common definition of clusters. As a consequence, cluster policies are hardly an isolated, independent and well-defined discipline. In general, cluster policies embrace all policies that affect the development of clusters, taking into account the synergies and interchanges between these policies. It is about stimulating links to the local business environment through public-private dialogues, the definition of joint research needs and co-development between contractors and so on. In many industrial countries the promotion of clusters is a central part of regional, industrial and/or innovation policies. Since the end of the 1990s, industrial and regional policies in particular have become increasingly concentrated on the stimulation of clusters and clustering processes. It should however, be kept in mind that cluster policy is not about creating clusters from scratch but rather putting in place framework conditions which favour cluster development.

*Cluster policies in Europe – a diverse field of action*

Although cluster policy approaches differ significantly across Europe, our observations indicate that regional cluster organisations face similar challenges to improve their competitiveness. Furthermore, cluster policies at the different levels cannot be seen as isolated policy measures, but as cross-fertilising instruments. What is needed is a reliable political framework for cluster management and therefore a clear division of labour and responsibilities at different political levels in order to mobilise the economic and social potential of clusters.

Cluster policies rely on a clear division of labour

The idea of a reliable multi-level multi-actor cluster policy is the focus of these policy recommendations. Each level has its specific functions and the related activities and measures need to mesh. It aims at strengthening the strategic and implementation capacity of the different political levels and presents ideas to avoid contradictions and tensions between the actions of the different political levels.

Cluster policies as multi-level multi-actor policies
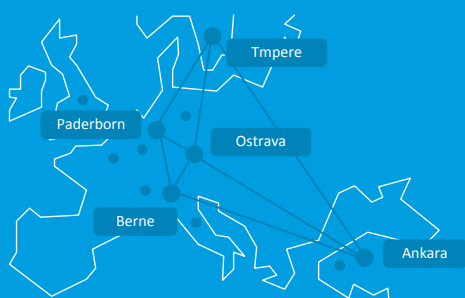
A concise set of policy recommendations was developed by building on the experience from NICE – Networking ICT Clusters across Europe project, the regional clustering efforts and the exchange in the framework of Europe INNOVA initiative. The guiding principles of our recommendations are the functions and tasks assigned to the different policy levels. This should allow policymakers at all levels to build them into their long-term strategies. The recommendations address first of all policymakers at all policy levels and cluster management organisations. SME-related issues are addressed with regard to SMEs innovation capacity.

The following areas were identified as crucial to the further shaping of successful cluster policies and management and the enhancement of clusters' and companies' competitiveness:

Policy recommendations – Lessons learnt from NICE

A framework for Self-organisation

The major challenge for a multi-level multi-actor cluster policy approach is to balance self-organised (bottom-up) initiatives and policy-driven (top-down) strategies. This is to say, the frame of reference should be a «two-tier-approach». Cluster initiatives depend on the commitment and active participation of the companies involved. In this respect, cluster management needs a clear and strong focus on self-organisation.
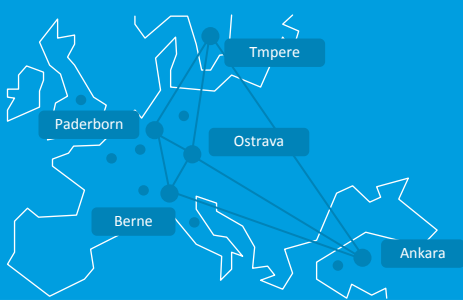

Imbalanced top-down and bottom-up cluster initiatives are counterproductive for successful cluster development.

Recommendations

‒ Provide a framework for cluster development which can facilitate different models of cluster evolution and management. Take into account bottom-up initiatives and follow a two-tier-approach.

‒ Let the private sector lead; the public sector should only play a catalytic role. Refrain from seeking to «build» new clusters of companies. On the contrary, favour a hands-off approach which strictly limits state intervention.

‒ EU policies should complement regional and national cluster policies by improving the functioning of the internal market (by eliminating factors that hamper knowledge flows and work force mobility) and by harmonising regulations.

Strategic Thinking

Cluster management has to be both strategically and operationally excellent to meet tomorrow's challenges. Taking into account that cluster development is a long-term process characterised by uncertainty, strategic alignment is essential. To avoid unrealistic expectations and conflict of priorities, strategic planning and implementation plays a vital role in cluster management. In the light of clusters' sustainability and competitiveness it is important to not solely define strategies and objectives for cluster, but also to identify companies that are innovative and ambitious to develop new products and services and new business opportunities.

Cluster managers are working so hard to be sure things are done right, that they hardly have time to decide if they are doing the right things.
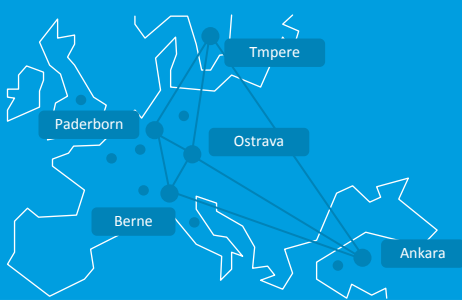
Recommendations

_ Concentrate evaluation on clustering processes and trajectory (e.g. role of key actors or events, people mobility, employment growth, firms' displacement and creation) rather than on static measures.

_ Base public funding on a common understanding and agreement about goals and indicators to measure their achievement. Encourage cluster organisations and stakeholders to envision their aims, and on the other hand it provides comparable measures for clusters' performance.

_ Organise the exchange of experience and practices by supporting the creation of networks of regional clusters.

Professional Management

To date, cluster management is neither an established nor a standardized profession. Whereas there is a clear tendency to standardization and more professionalism serious bottlenecks in the day-to-day work remain and hinder further professionalization of cluster management. Firstly, networking is not generally accepted as a serious profession with the result that cluster management lacks basic funding. Secondly, successful cluster management is often determined by the reputation and competence of a single cluster manager, and so is the cluster performance. That involves the risk that the cluster might lose its leading figure – its «top seller» – if the cluster manager leaves.

Cluster management often lacks professionalism. Aiming at «world-class» requires continuous advancement and optimisation.

Recommendations

— Ensure reliable financial and institutional bases for cluster management. Funding should be decline over time to ensure the commitment of members of established clusters whilst minimising the equity financing for evolving clusters.

— Provide cluster platforms to stimulate international exchange of experiences and knowledge of cluster management which provide space for discussion about common problems and failures, as well as solutions.

— Organise a European school for cluster management and intensify standardisation efforts.
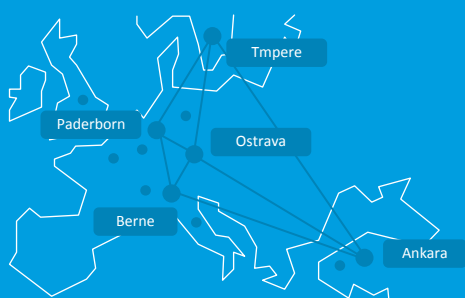
Regional Division of Labour

The more established and sophisticated the institutional economic development system, the greater the need for coordination and co-operation. In our understanding, cluster management is an integral part of a decentralised economic development policy. Decentralisation goes hand in hand with a higher degree of horizontal coordination of workforce development (labour market policies) and economic development activities. This requires not only rearranging organisational structures, but a change in the behaviour and culture of government agencies and other partnering organisations. Creating a multi-actor multi-level coherence of strategies and congruent activities means leveraging synergies.

The absence of a clear division of labour concerning regional development and cluster-related activities causes tensions and inefficiencies in the regions.

Recommendations

— Exploit synergies and complementarities between the different actors to cross-fertilise efforts and thus enhance the efficiency of cluster management.

— Functional spaces rather than administrative and regional borders should serve as guiding principle for the development of cluster policies.

— Foster the regional division of labour through decentralisation of national cluster policies and the stimulation of horizontal co-operation to significantly enhance coherence and synergies between different operational agencies and policy measures.

—   Intensify the dialogue between cross-cutting policies to strengthen regions and cluster-specific efforts.

Capacity Building

In general, cluster management is a long-term process. Accordingly, appropriate methods and instruments to tackle future challenges will change over time. Continuous learning and capacity building are crucial in adapting cluster management practices to changing framework conditions. Against a background where there is no blue print for successful cluster management or a one-size-fits-all model, handbooks and manuals for cluster management provide a good first orientation, but are by no means enough. What is required is investment in people leading ideally to the provision of better services. One major task is to develop a framework for capacity building.
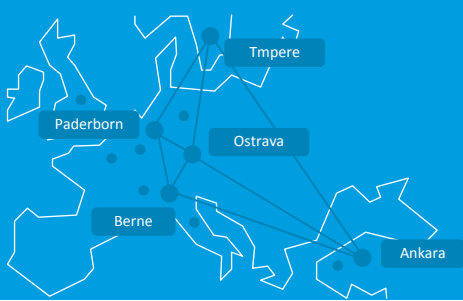

Cluster management is not generally recognised as new profession and integrated part of the regional innovation system.

Recommendations

—   Organise a systematic, high quality data collection and analysis procedure to provide coherent and reliable information on the development of regional clusters and its management.

—   Adopt tools and procedures to continuously improve the professional performance of your cluster management. Join international networks and communities.

—   Organise European cluster forums and academies to support capacity building which could help prepare a quality label for cluster organisations as new supporting forms of innovative SME.

Openness

It is a well-known fact that European regions vary considerably in their capacity to develop knowledge and technology, and at the same time, are competitors as they try to attract money, brains and resources.

This is also applicable to clusters. Clusters acting in isolation cannot develop the critical mass that will produce the innovations needed to compete globally and thus, will not reach the stage of «world-class» clusters. Facing the challenges of globalisation merely concentrating on national markets, technology, and research is insufficient. Hence, clusters need to anticipate changes, that is, a shift from a «closed» to an «open and collaborative» innovation paradigm. Through openness clusters not only gain visibility, but also perpetuate knowledge heterogeneity and diversity, two factors crucial for sustainable cluster development.

Cluster management often focuses exclusively on regional networking; acting as autonomous and isolated island causes lock-in effects.
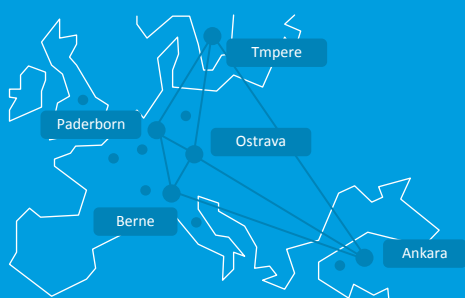
Recommendations

— Develop an attitude of «openness» and integrate it into your strategic programme and activities. Firstly, adopt the role of «boundary spanners» which build a bridge between clusters and non-local actors allowing information to flow into the cluster. Secondly, import clustering experience from other parts of the world into the cluster.

— Anticipate excessively rigid specification in your cluster programs and explicitly encourage changes and modifications in cluster strategies during the course of development in order to allow cluster organisations to adapt strategies to their needs.

— Further the strategic interplay of European, national and regional policies, as it is crucial for dynamic and sustainable development of clusters.

Fostering SMEs innovation capacities

Clusters' openness is closely related to individual companies' dynamic capabilities, defined as their ability to introduce innovations in a relatively stable way over time. Cluster members are connected to other companies and institutions of the cluster through various exchange relations and mutual interdependencies.

As a result, the individual companies and their innovative capabilities are affected by the actions and behaviour of other cluster members and, in turn, each individual enterprise and its actions affect the possibilities of other companies to make use of the knowledge. Due to uncertainty and the tacit character of knowledge geographic proximity is especially relevant for knowledge exchange between companies in emergent and growing clusters. In mature clusters, in contrast, outward linkages gain in importance in sustaining companies' innovative capacity. In stable networks, companies' competences will become more similar and knowledge codified leading to a decrease in opportunities for future learning.

The capabilities of enterprises differ within a cluster, with major consequences to their performance. Many SMEs lack absorptive capacity and thus, are not able to unfold their full innovation potential.

Recommendations

_ Develop policies that foster entrepreneurship and account for the improvement of SMEs' intellectual assets management and networking. Redesign innovation policies which address SMEs in their regional context.

_ Augment SMEs' involvement in research projects as they can help companies to develop new products and services and improve existing ones.

_ Provide technology platforms that will link SMEs with support organisations including government and public sector agencies, professional innovation agencies such as universities and research centres, and investors to enhance SMEs' innovation capacity.
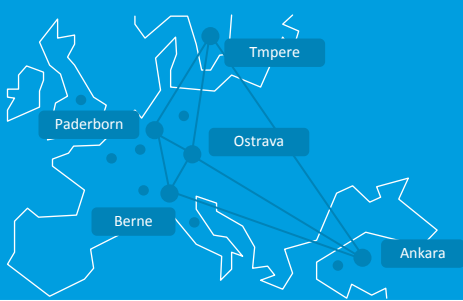
Strategic Options & Alternatives

The cluster concept has achieved remarkable breakthrough, but concerns have emerged recently about the content and quality of some of the cluster initiatives. Given the prevalence of the concept, these concerns could have a significant impact on the value of clusters and their contribution to regional economic development. Not every region in Europe possesses clustering potential. Therefore, cluster policy may not be an appropriate choice for an economic development instrument in any particular region.

Consistent implementation of cluster policies fosters regional disparities, as regions without clustering potential fall behind.

In our view, a sophisticated policy framework is required which sets the stage for various innovation strategies. We call such concept *«Innovative Space»*. In
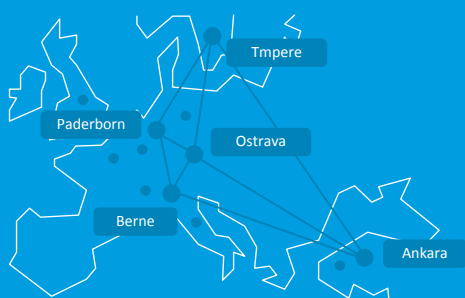
this concept clusters are one opportunity to stimulate economic development, but alternatives exist which might fit better to regions without clustering potential. The basic idea of our approach is to start with thinking of innovation rather than of regions. The cluster approach illustrates that an open and innovative context or milieu is important. Knowledge sharing and learning, competencies and networking, openness and face-to-face-contacts, symbols for innovation such as architecture or success stories, are important assets. Regions without clusters or clustering potential should develop these assets and related strategies to further their innovation capacities rather than trying to imitate successful cluster regions. Quality of life and political processes or culture are examples for other innovation areas. Regions and decision makers need to be aware that different opportunities exist and that the appropriate strategy is a matter of the regional specificities.

To date, little is known about successful innovative regions without clusters. Therefore, we recommend that different approaches to innovative region pathways should be worked out at all policy levels. This requires a broader understanding of innovation which is not limited to economic innovation, but also considers non-economic and non-technological innovations. In accordance with this, funding of regional development should not be limited to clusters.

In conclusion, clusters are important drivers of innovation and contribute to the competitiveness and sustainable development of European industry and services, and boost the economic development of EU regions. However, to make clusters a viable instrument for regional development we do not need more, but better cluster policies. These policies need to take into account regional distinctions and provide leeway for alternative strategies to fully unfold the competitiveness of regions and companies through improved innovation capacities. Regarding the way ahead we identified three main challenges:

1. *A European Cluster Policy Framework*

To further improve cluster policies in Europe which aims at a higher level of efficiency, policy dialogue as well as policy design and implementation, need to be intensified. A joint European cluster policy

framework, which combines growth and cohesion objectives, takes into account regional distinctions and promotes a clear division of labour between different policy levels could serve as a reliable frame of reference for future cluster policy design and implementation.

2. Excellence

As has been outlined in this report, there is not a general lack of clusters in Europe but there is a lack of globally competitive that is, excellent clusters. Aiming at «world-class» clusters requires quality criteria in relation to interactions, scope and impact, and standardisation in cluster management. Both, standardisation and quality criteria require further improvement.

3. Valorisation

Overall, the significant efforts undertaken by the Commission with initiatives such as Europe INNOVA and Pro INNO Europe have resulted in good progress in promoting clusters' trans-national co-operation and to awareness rising in less advanced cluster regions. In order to prevent excessive investments or duplication of cluster management practice and instruments, a better valorisation of the insights gained and the tools developed is required. This calls for a European information service on clusters which not only captures clusters and cluster organisation, but also business opportunities related to clustering and international networking. Regional decision makers should not try to imitate other regions, but should combine the information available from such platforms with existing, cumulated cluster know-how in the region, in order to create new possibilities for advanced cluster concepts.

As the experiences in NICE and other Europe INNOVA projects have show, commitment and enthusiasm of the partners involved provided opportunities to develop common initiatives, and to contribute to the opening of new routes for trans-national cluster co-operation and entrepreneurial networking. Addressing the aforementioned challenges will further this positive development. This requires however, an acceptance of global thinking by policymakers, cluster managers and entrepreneurs.

Global thinking, a prerequisite for excellent clusters

3 Dissemination & Use
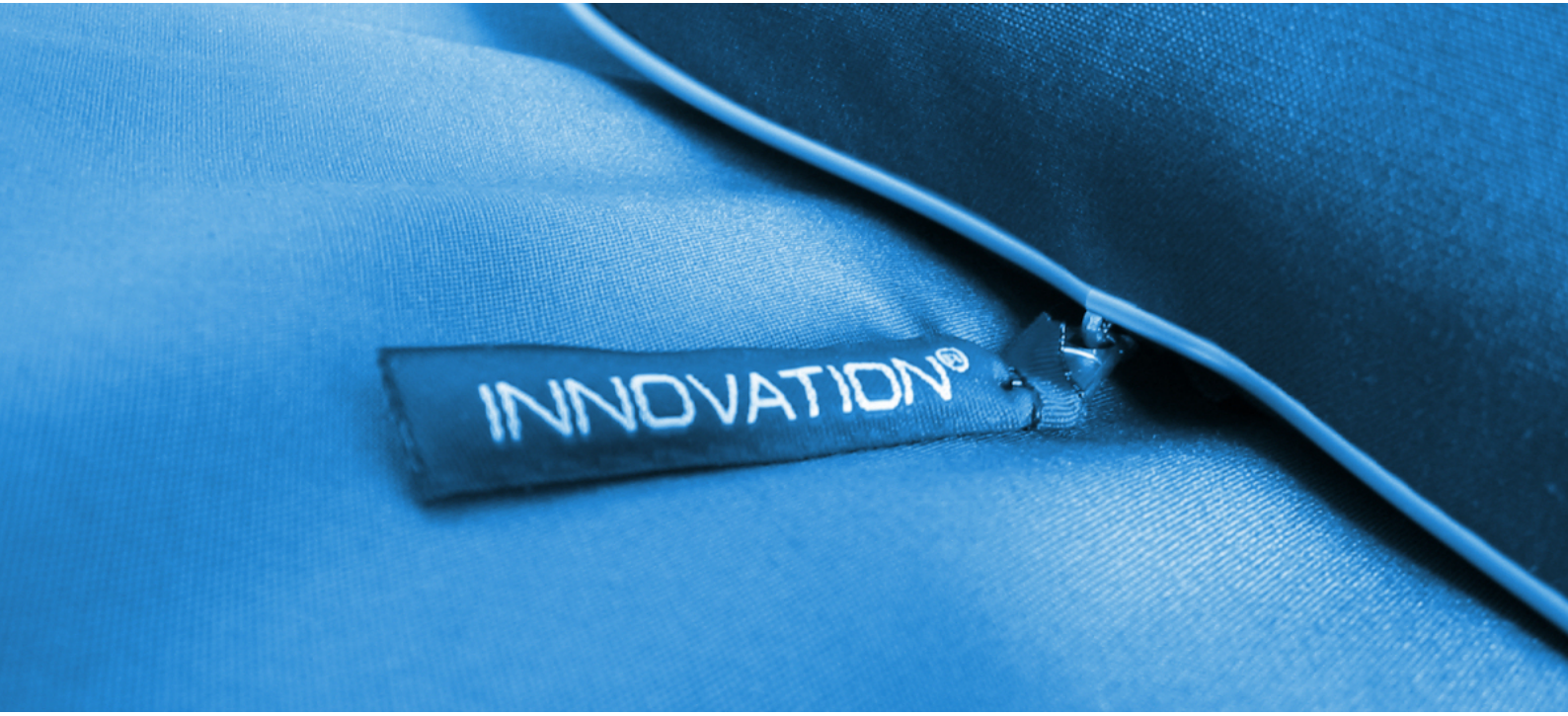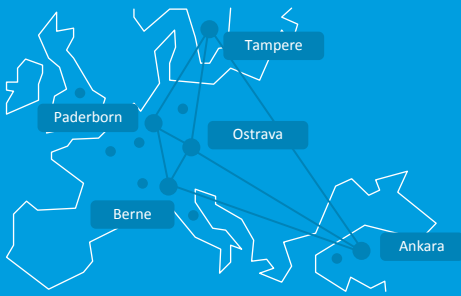
This section of the final activity report outlines the strategy of ensuring that the outcomes of NICE can be exploited after the end of the project.

3.1   Feedback into Education

As was outlined in this final report, our findings indicate a lack of standardisation and professionalism in cluster management. The insights gained during the project term in combination with consolidated findings of cluster-related research provide a good basis for the development of a further vocational education lecture. The Institute for Work and Technology is in cooperation with the University of Applied Sciences Berne and tcbe.ch – IT Cluster Berne in the process of conceptualising a modular system for vocational and higher educational courses. To date, it is envisaged to start with an international summer school which will be refined and further develop into bachelor and/or master courses not only on cluster management, but on innovative spaces. In addition, the Tampere University of Applied Sciences uses the project results in their vocational training courses as well as in bachelor and master courses.

Furthermore, the project findings gave impetus to a PhD thesis on the question if companies in a cluster show higher innovation dynamics in terms of economic success than companies outside the clusters. Whereas former analyses mainly focused on the region, in this thesis the object of investigation is the single company.

3.2   Bringing together Science and Practice

As a result of the valuable co-operation in the framework of NICE and to intensify the exchange between cluster research and cluster management practices Christoph Beer, cluster manager of tcbe.ch – ICT Cluster Berne was assigned as «Research Fellow» at the Institute for Work and Technology, research unit «Innovation, Space & Culture». By doing so, questions raised in NICE such as the question of functional spaces rather than administrative
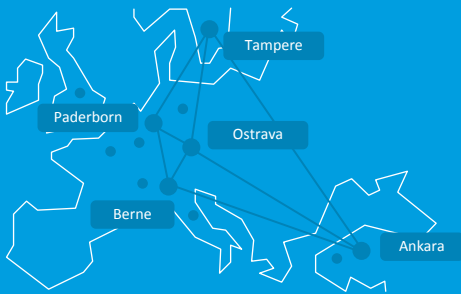
borders as guiding principle for future cluster policies, can be further researched with a continuous feedback from practitioners.

3.3   Stepping forward

To date, many cluster initiatives have a technology bias. In contrast, excellent service clusters are quite rare. Assuming that Europe has a strong position in knowledge intensive services the support of related clusters is of importance. Through the co-operation in the framework of the Europe INNOVA initiative the finance project ACHIEVE and the cluster project NICE identified the need to combine finance and cluster initiatives and successfully applied for a joint project called «ACHIEVE More». The project aims to bring together incubators, cluster managers and early stage venture capitalists to accelerate the growth of knowledge intensive service companies in the ICT sector. Here, the outcomes of two Europe INNOVA projects are utilised and combined to develop concepts to fertilised KIS ventures development.

3.4   Trans-national Cluster & Business Networking

The initiated co-operation at cluster management and entrepreneurial level will continue. With regard to business networking the Regional Development Agency Paderborn is jointly with Mediamaistri Group preparing an international event on Open Source Solutions. Moreover, the cluster managers of the participating clusters have agreed to function as contact points for SMEs from the other regions to prepare the ground for further business co-operation. Consolidation a durable European ICT cluster network is one of the future aims.

3.5   Other activities

The experiences made in NICE are used to bring forward ongoing cluster initiatives. For example, IAT is in co-operation with the VDI in charge for the
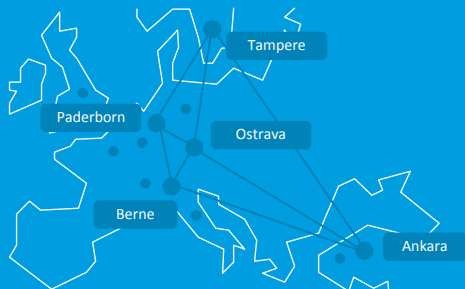
cluster secretary of the federal state of North-Rhine Westphalia. The secretary co-ordinates and monitors the federal state cluster activities and is responsible for trans-national cluster cooperation, as well as for cross-clustering.

Further activities comprise consultation of single cluster initiatives (e.g. Re-structuring of economic policies (cluster policies) in Brandenburg, cluster initiative East Westphalia-Lippe, national cluster policies in Turkey) and presentations at conferences.

In the view of the project partners NICE was just the beginning, now the methodologies developed and contacts made will be utilised to further improve cluster management practices in the regions.

3.6   Publishable Results

The following table summarised the publishable results produced during the project term.

Table 2: NICE – Publishable Results

No.	Partner	Description
1	TCBE	Regional Cluster Study Berne
2	HERMIA	Regional Cluster Study Tampere
3	WFP	Regional Cluster Study Paderborn
4	METU	Regional Cluster Study Ankara
5	RDAO	Regional Cluster Study Ostrava
6	IAT	Comparative Cluster Analysis – Five ICT Regions in Europe
7	TCBE	Documentation 1st Cluster Management Workshop, Berne, Switzerland
8	WFP	Documentation 2nd Cluster Management Workshop, Paderborn, Germany
9	HERMIA	Documentation 3rd Cluster Management Workshop, Tampere, Finland
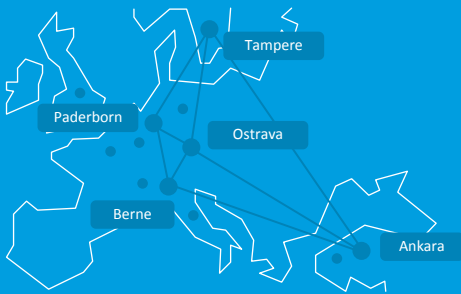
No.	Partner	Description
10	IAT	Report on «Balanced Scorecard as Instrument for Strategic Cluster Management»
11	TCBE, ISO	Documentation 1st Business Networking Workshop, Berne, Switzerland
12	WFP, CODEX	Documentation 2nd Business Networking Workshop, Paderborn, Germany
13	HERMIA, TAW	Documentation 3rd Business Networking Workshop, Tampere, Finland
13	METU	Documentation 4th Business Networking Workshop, Ankara, Turkey
14	RDAO	Documentation 5th Business Networking Workshop, Ostrava, Czech Republic
16	IAT	Report on «Business Networking – Benefits for SMEs»
17	IAT, TUT	Report on «Policy Recommendations – Lessons learnt from NICE»
18	TUT, HERMIA	*Seppänen, M./ Miettinen J./ Thorburn, K.(2008):* A cluster creating value: an analysis of cluster managment's activities from the members' perspective. In: Proceedings of the EuroMOT 2008. Nice, France September 17-19, 2008.
19	IAT	Europe INNOVA Final Brochure.
20	IAT	*Terstriep, J. (2008):* Cluster Management – Status Quo & Perspektiven. In: Institut Arbeit und Technik: Jahrbuch 2007, 60-70.
21	IAT	*Terstriep, J. (2006):* NICE – Networking ICT Clusters in Europe: Innovation through collaboration. In: Services governance and public policies: RESER 2006.
22	IAT	*Terstriep, J. (2006):* Cluster der Informations- und Kommunikationstechnologie im europäischen Vergleich. In: Institut Arbeit und Technik, Jahrbuch 2006, 121-142.