

tactics tactics tactics

Better cluster policies and tools for implementation

Using clusters to address emerging industries and services



WHAT IS TACTICS?

TACTICS (*Transnational Alliance of Clusters Towards Improved Co-operation Support*) aims at supporting and further expanding the European Cluster Alliance, and contributes to the development of better cluster policies and practical tools for implementation in Europe. The project is one of the three INNO-Nets within the PRO INNO Europe initiative under the Commission's Competitiveness and Innovation Programme from DG Enterprise and Industry.

TACTICS, coordinated by **OSEO**, the French national organisation supporting SMEs and mid-caps development, brings together seven of Europe's leading national and regional innovation and cluster policy organizations – namely **VINNOVA** (SE), **TMG Upper Austria** (AT), **Manchester Metropolitan University** (UK), **IWT Flanders' Innovation Agency** (BE), **Veneto Innovazione** (IT), and **PARP** (PL). The partners, committed to improving policy cooperation and with a track record of experience with clusters, have been assisted by a Reflection Group of external cluster policy experts.

Six task forces discussed actual or proposed policy actions, coming up with concrete policy recommendations on the following topics relevant to cluster policy: fostering international cluster cooperation, channelling RDI funding through excellent clusters, fostering user-driven innovation through clusters, supporting cluster marketing and branding, evaluating impact of cluster-based policies, using excellent clusters to address emerging industries (including innovative services).

TACTICS claims that cluster initiatives can

- improve the performance of the innovation support system
- leverage the renewal of European industry
- engage SMEs in research and innovation support programmes
- play an important role within smart specialization strategies
- gain competitive advantage by internationalising, boosting their visibility and attractiveness, and involving users in innovation processes.

For its covers, TACTICS series of publications gets inspiration from several works of art or uses digital pictures recalling the positivist and optimistic vision of pictorial movements flourished between the XIX and XX century. Each image can be given an interpretation according to the main message of the publication. The works were chosen because their subject and the use of the light and the colours can be easily associated with the idea of innovation, movement and progress embodied by the clusters.

Cover credits: Antonio Sant'Elia "The New City", 1914. Musei Civici, Como.

The image of a futurist building stretching towards the sky is associated to the idea of emerging industries. The drawing represents the dynamism of modern life (industry linked with technology) and conveys the idea of a vision for the future.

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Using clusters to address emerging industries and services

working paper

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Executive Summary

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Continuous efforts are needed for renewal of the industrial base in Europe in order to restore its economic growth and prosperity. Europe has to identify and exploit new growth areas and business opportunities which can result from new Key Enabling Technologies (KET) or innovative business models/concepts as well as from new application sectors which can emerge out of intersection of existing economic activities and cross-sectoral/cross-cluster activities. A robust process should be applied to enable industries to evolve encompassing three elements: Demand, Innovation, Competence and Time.

There is no commonly accepted definition of emerging industries or a methodological agreement on how to identify emerging industries. Some experts believe that emerging industries have to be considered as emerging in the context of a certain region or country or market.

For the purpose of this document, Emerging Industries and Services are broadly understood as entirely new industrial sectors driven by applications of new technologies or other radical innovations OR existing economic activities that undergo renewal and transformation, evolving and upgrading and/or merging into new industries.

Being most often problem-driven and involving complementary skills and different backgrounds, the evolution of economic activities occurs to take advantage of new opportunities and address global challenges. One feature of emerging versus established industries is shifting the industrial base from offering simply products and/or services towards provision of more comprehensive solutions. Special focus should be given to new services since in some industries service innovations drive transformation of whole sectors. Some industries, like for instance creative and ICT, can drive productivity improvements and contribute to evolution and growth noticed in many other sectors.

There is a growing consensus that clusters can have an important role to play in the renewal of European industries and strengthening value chains through bridging research and business, capturing new demands, pursuing new business models, combining manufacturing with services, enabling consumers, etc. By fostering interactions and cross-fertilization between different innovation actors (including users/customers) in a region and promoting cross-sector and cross-cluster activities, clusters offer a favourable ecosystem in which new industries can flourish and grow stronger.

To get insight into activities undertaken on regional and national level in Europe, a number of existing programmes and initiatives have been investigated in view of their relevance to identifying and stimulating new growth areas with regard to potential cluster involvement. Case examples include national and regional cluster programmes, cross-cluster/cross-sector networking and projects/initiatives focused on societal challenges as well as examples of industry-initiated cross-fertilization between different sectors and renewal of traditional strongholds.

8 IDENTIFICATION OF NEW GROWTH AREAS

Case examples show how different regions and countries approach the task of identifying emerging strongholds and future specialisations. In some cases, new growth/priority areas have been pre-defined by public authorities (e.g. Northwest England, Spitzencluster Leading-Edge and Baden- Württemberg Region); most often with a broader technology, application or demand perspective rather than an industry focus. In some other examples this has been decided totally bottom-up, with a focus on opportunities resulting for instance from cross-sector or challenge-driven approach (e.g. Catalonia, Veneto Region, VINNVÄXT Programme, turisTEC Cluster). Some cases have displayed how cluster organisations and initiatives started and lead this spontaneous bottom-up process of entrepreneurial discovery of new growth areas (e.g. Veneto Region, turisTEC Cluster) while in other cases tailored policy actions and instruments catalysed and effectively facilitated this process through cluster organisations and initiatives (e.g. Catalonia, VINNVÄXT Programme).

There is no common set of 'emerging industries' across the regions/countries in the case studies. There are several common themes in terms of new technologies, markets and changes to societal challenges, pre-defined broadly to include companies/clusters from different backgrounds effectively interlinking production sectors/clusters with services. Identification of future strongholds aims at discovering new opportunities resulting from economic, societal or environmental challenges while also involving effective matching of economic strengths of the country/region with other values or assets (e.g. scientific, creative, etc.).

ROLE OF POLICY MAKERS

National and regional case studies have provided examples of policy measures relevant to both emerging industries and clusters. Policy mechanisms and support tools have been examined to provide answers to the question on what roles governments and public agencies on different levels can play to facilitate the emergence of new industries/services.

The primary role of policy makers is to provide more favourable framework conditions for the emergence of new growth areas and specializations through actions addressing issues such as demand conditions, research capacity, skills and competencies, legislation, financing, infrastructures and business services, etc.

However, practical cases show that policy makers are not exclusively focused on framework conditions for the emergence of new industries and services, but they take a more pro-active approach to engage in different activities seeking a better understanding of new

trends by looking into processes that drive new demand. They use cluster initiatives as an effective policy tool for informing about strategic transformation processes and adjusting the policy response accordingly.

Unlike in the case of traditional industries, the rationale for policy intervention in emerging sectors goes beyond market and system failure arguments and is rather based on technology and market opportunities and challenges.

Policy makers use other policy approaches, in addition to cluster policies, to stimulate new growth areas and align other policy instruments. Policy support includes for example: direct grants, technical support through dedicated services and projects, public procurement of pre-commercial solutions and facilitating access to private investors.

Direct financing mechanisms dedicated to emerging areas seems to be more flexible when compared to financing for established industries. More flexibility is allowed for time frames of projects related to new areas of growth in order to give room to explore and test new ideas/approaches.

Current policy approach and existing instruments at EU level represent a certain potential that can be used more effectively for the better involvement of cluster initiatives and organisations in the processes of stimulating new growth and industrial renewal. Some European programmes offer various opportunities for cross-fertilization and new types of collaboration, thus being suitable for catalysing the emergence of new areas of growth and industrial renewal. At the same time, if not directly targeting clusters, they offer potential for involvement of clusters and cluster organizations. Examples of relevant policy concepts and instruments include Smart Specialization, Lead Market Initiative, Knowledge and Innovation Communities and European Innovation Partnerships.

ROLE OF CLUSTER ORGANISATIONS

Case examples have provided information on what role cluster organisations have in emerging industries/services, what services and support are offered to cluster companies and what activities are especially relevant if compared to traditional sectors.

Cluster organisations differ considerably across Europe and therefore a wide variation of support and services are provided by individual cluster organisations to cluster constituents. The types of support and services that are particularly relevant to encourage the growth of emerging industries can be summarized as follows:

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- help enterprises with early identification of new business opportunities emerging from new technologies, new business models, changes in market demands, linking different industries, etc.;
- help seek complementary competencies for the cluster by actively facilitating cross-sector and inter-cluster collaborations (e.g. with creative clusters, service sector, etc.);
- provide services dedicated to creation and development of start-ups and spin-outs to effectively contribute to commercialization of new ideas and creation of new products and markets;
- promote open innovation and user involvement by facilitating access to cross-fertilization platforms and testing/demonstration infrastructures;
- provide support to strategic business development to help companies with renewal and upgrade of their existing profiles;
- define new specific skills and competencies needed for emerging sectors;
- provide skilled personnel and specialized training programmes for cluster firms;
- facilitate access to equity financing and public funding mechanisms for cluster firms to implement their new growth strategies and launch high-risk projects.

POLICY RECOMMENDATIONS

Smart observation and identification of new growth areas

- more proactive role of policy makers in identifying and stimulating emerging areas is needed versus simply improving framework conditions;
- for identification purpose of new growth areas policy makers cannot rely on published data and need to apply smart observation approaches involving combinations of methods (e.g. foresight and other analyses on future market opportunities, mapping of cluster/industry evolution over time, intelligence and bottom-up consultations, using alternative expert groups, etc.);
- identification processes should involve effective matching of economic strengths of the country/region with other values or assets while new creative ways should be sought to involve cluster organizations and cluster actors in the early identification of emerging trends.

Support for inter-clustering and cross-fertilization

- policy support to cross-fertilization and inter-clustering is needed between clusters across sectors/disciplines and across geographies (e.g. thematic platforms, sometimes focused on 'grand societal challenges', that bring research and innovation actors/environments together, programmes aimed at linking different existing clusters that can complement each other, etc.);

-
- cluster programmes should be initiated in sectors where regional economic performance is stronger than the national average or where niches have been identified with strong focus on cross-sectoral collaboration, multidimensional nature, pursuing a matrix of science/technology, markets and business sectors of strength;
 - proactive matching between creative industries (especially design, but also simulation, games, etc.) and other sectors has to be pursued to spur new market opportunities;
 - more focus is needed on service innovation (e.g. linking manufacturing with services and creating value by delivering integrated new solutions);
 - policy support for emerging industries should recognize evolving concept of cluster related to strategy, end-user markets, business models, cross-industry scope, etc.

EU policy context

- it is recommended to better integrate emerging industries/services and clusters in a broader context of EU policy areas (e.g. Regional Innovation Strategies for Smart Specialization - S3);
- participation of SMEs through clusters should be promoted in existing cross-sectoral, transnational collaboration projects that bring together private and public sectors such as Lead Market Initiative and initiatives of European Research and Technology Institute (EIT);
- reinforced and enlarged European Cluster Alliance (ECA) should be used to help activate a policy dialogue and learning in Europe and put focus on topic of emerging industries to speed up the process of planning future policy actions and instruments;
- such issues as IPR protection (including copyright, trade mark, etc.) on Community level, faster standard-setting, effective legislation and revision of existing state aid rules, still need to be addressed.

New financing approaches

- more flexibility in financing mechanisms is needed in terms of selection and funding of cluster projects to effectively spur new areas of growth through excellent clusters (e.g. phased selection procedure, phased financing with continuation of financing being contingent on performance milestones, etc.);
- more funding opportunities should be available for feasibility studies, proof of market and proof of concept type projects. Programmes and schemes should be offered for funding demonstrators, prototyping, trials and testing, etc.;
- it is recommended to improve access through cluster organizations to risk finance and apply new funding mechanisms such as guarantee schemes, innovation vouchers (cross-sector and/or cross-border), risk-sharing facilities, etc.;

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- cluster support packages could be made more effective through combination of direct financing and technical support for implementation of new growth strategies and higher risk projects with higher societal value;
- emergence of new industries and services should be supported by public procurement with strong focus on pre-commercial procurement. Procedures need to be better oriented towards using clusters which can be also involved to help define procurement outline;
- Innovation Express cross-border initiative (IE) should be continued as an established funding mechanism and recognized brand for inter-cluster collaboration with a focus on emerging industries/services in future calls for proposals.

Introduction

In recent years some experts and politicians have alerted that Europe needs rapid industrial renewal to catch up with global competitors and restore its economic growth and prosperity. They have argued that joint and structured efforts are required to find a recovery path for European industry. A broad agreement has been reached that challenges need to be turned into sustainable opportunities to help get Europe at the lead of the New Industrial Revolution¹.

Continuous efforts are needed to achieve long-term changes to the European industrial base in order to achieve better productivity and resource-efficiency and make Europe more attractive place for investors and highly-skilled workers. New growth patterns and models have to be identified and more growth-oriented measures must be pursued as opposed to one-sided policies being focused exclusively on austerity.² Alternative approaches have to be sought to shift from budget cut solutions that slow down the economy to more pro-active options that can reverse downturn and pave the way for industrial renewal. There is a need for unlocking growth potential through policy alignment, re-setting investment priorities and pooling existing resources to capture opportunities resulting from new technologies, lead markets and service innovations. As the rate of change is increasing, to be capable of facing more competition, especially from the BRIC countries, regions and businesses must get smarter at enabling industries to evolve.

A robust process should be applied to enable industries to evolve encompassing four elements: Demand, Innovation, Competence and Time. Time is crucial in the process as the window of opportunity when the other three elements come together is short lived (if it takes too long to bring all parts together, the opportunity will be lost and competitive regions and businesses will realise the benefits).

Europe has to identify and exploit new growth areas and business opportunities in order to address societal challenges and overcome the crisis. Such opportunities can emerge from new enabling or industrial technologies that create high-growth jobs as well as from innovative business models/concepts and entrepreneurial savvy. The evolution of economic activities comes from new opportunities, that very often emerge from the intersection of existing economic activities while also being driven by a problem-related approach, thus offering a strong potential to address grand societal challenges that have resisted traditional economic activities and government approaches to solving them. The benefits from evolving/emerging industries are economic growth, but this must be sustainable and economically inclusive.

There is a growing consensus that clusters and cluster initiatives can have an important role to play in the renewal of European industries and strengthening value chains through bridging research and business, capturing new demands, combining manufacturing with services, enabling consumers, etc. While clusters form an effective tool of innovation policy, they can be also regarded an integral component of industrial policy that aims at effective transformation of European industry and re-building economic strength of Europe.

¹ See recent vision of EC *Europe at the lead of New Industrial Revolution*: http://ec.europa.eu/enterprise/newsroom/cf/itemdetail.cfm?item_id=5968.

² <http://library.fes.de/pdf-files/id-moe/09080.pdf>.

Emerging industries and their relevance to clusters – description of theme

There is no consistent and commonly accepted definition of ‘emerging industries’ despite various attempts to describe and classify them.

For the purpose of this report TACTICS partners have decided to refrain from imposing own definition and concurred that a very broad understanding of emerging industries should be relevant as follows:

EMERGING INDUSTRIES AND SERVICES ARE UNDERSTOOD AS:

◆ Entirely new industrial sectors driven by applications of new technologies or other radical innovations

OR

◆ Existing economic activities that undergo renewal and transformation, evolving and upgrading and/or merging into new industries.

Growth areas can result from new Key Enabling Technologies or innovative business models/concepts as well as from new application sectors which can emerge out of intersection of existing economic activities and cross-sectoral/cross-cluster activities. New trends and growth areas can be originated by traditional economic activities and established clusters as the same final products can

be offered with use of technological or process improvements. Sometimes mature or declining industries/clusters can merge into a new industry to seek new market opportunities building upon a combination of complementary competencies and functions.

The process of industry upgrade/transformation goes beyond traditional sectors and involves complementary skills and different backgrounds, very often leading to emergence of clusters that do not fit into NACE classification. The evolution of economic activities occurs to take advantage of new opportunities (e.g. technological advances) and address new needs and markets. New industries and services are most often problem-driven and emerge with the objective to address societal challenges.

Emerging industries can thus be grouped into three different types:³

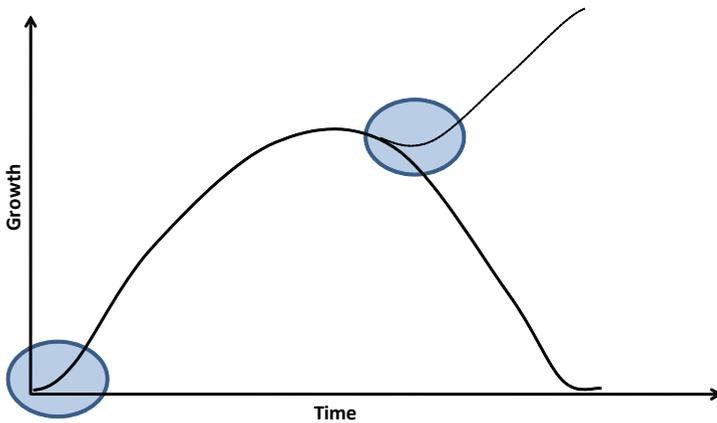
- 1) Existing knowledge applied in new ways to existing needs;**
- 2) Existing knowledge applied to new needs;**
- 3) New knowledge applied to existing or new needs.**

One feature of emerging versus established industries is shifting the industrial base from offering simply products and/or services towards provision of comprehensive solutions. Special focus is given to new services since in some industries, like maritime or tourism for instance, service innovations drive transformation of whole sectors and companies representing very different backgrounds. Some industries, like for instance creative and ICT,

³ The grouping was worked out within European Cluster Policy Group (ECPG)

16 have the potential to drive productivity changes and contribute to evolution and growth in many other sectors.

Emerging industries and services can be visualized with a curved line representing the development of a sector (or cluster) over time – with periods of development, growth, maturity and decline OR renewal/transformation, where encircled areas represent “emerging phases” (when the industry is growing at a rate faster than the overall economy).



Source: TACTICS

In this context clusters can offer favourable ecosystem in which new industries can flourish and grow stronger by fostering interactions and collaboration between different creative milieus and innovation actors (including users/customers) in a region and promoting entrepreneurship by providing a fertile business environment for emerging high growth firms.

Comparing to traditional industries, clusters in emerging industries may be considered as a broader concept that needs use of other non-statistical identification criteria related to strategy, end-user markets or business concept but also to growth and profitability of business higher than industry average, cross-industry scope and relevant critical mass.

Cross-cluster and cross-sector activities can catalyse emergence and facilitate growth of new economic areas, thus contributing to renewal of industrial base in Europe and helping to build industrial leadership and smart specialization in regions/member states.

How regions/countries in Europe and beyond work with clusters in emerging industries?

The TACTICS project has explored how various regions/countries across Europe (and beyond) are addressing the issue of emerging industries, and what policy approaches are most effective. A follow-up to the European Cluster Policy Group (ECPG) recommendations has been provided and linked to the other relevant EU actions/policy areas. A number of existing European projects, programmes and initiatives have been investigated in view of their relevance to identifying and stimulating growth areas with regard to potential cluster involvement. Discussions involving TACTICS partners, Reflection Group members and other experts on examples of different approaches have taken place, with the objective of drawing up proposals for new policy actions and practical tools to catalyse emerging industries and services through clusters. In addition, the TACTICS project has been represented on the European Forum for Clusters in Emerging Industries (EFCEI), which is part of the European Cluster Observatory project, phase 3 (ECO3) coordinated by PricewaterhouseCoopers.⁴

To get insight into activities undertaken on regional and national levels in Europe, a call for cases was launched under TACTICS and European Cluster Alliance (ECA) using a pre-defined template. As a result, very interesting cases were collected and analysed: providing examples of national and regional cluster programmes, cross-cluster/cross-sector networking and projects/initiatives focused on societal challenges as well as examples of industry-initiated cross-fertilization between different sectors and renewal of traditional strongholds.

⁴ More information can be sought from PricewaterhouseCoopers <http://www.pwc.be/>

The TACTICS project has addressed the key questions/issues:

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1. How can new areas of growth be identified?
2. How can policy support catalyse emergence and growth of new industries/services and how can clusters be used in this context?
 - how do policy instruments differ when directed at established vs. emerging industries in terms of financing level and duration, levels of public support, process support, etc., or indeed is there a difference?
 - how do policies supporting clusters in emerging industries fit into the broader regional growth and in particular regional innovation and smart specialisation strategies (RIS3) as well as other EU actions/policy areas?
3. What is the role of cluster organisations?

This document is structured around above three question and elaborates on the input received from the project partners and experts from the Reflection Group on the main issues based on case examples, synthesized with 'Lessons Learned' and translated into policy recommendations.

Various case examples have been investigated to determine how new areas of growth can be identified and stimulated. National case examples include UK, Germany, Sweden, Spain, New Zealand and Australia, while regional cases cover such regions as Catalonia, Northwest England, Baden-Württemberg, Skåne, Veneto, Upper Austria and Baltic Sea macro region.

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The table below summarises case examples exploring different regional and national approaches involving various agencies and authorities working in the field.

No	Case title	Example of
1	Cluster Policy in Baden-Württemberg (Germany)	How regional-level cluster programmes and initiatives address emerging industries
2	Roadmap for energy research in Upper Austria	How strategic economic and research priority of energy drives cross-cluster/ cross-sector networking
3	Cluster policy in Catalonia (Spain): Apparel and Textile Cluster	Renewal of 'traditional' stronghold
4	Kids Cluster	Cross-cluster cooperation around a common view and strategy relevant to end-market needs
5	turisTEC Cluster, Balearic Islands (Spain)	Transformation of tourism industry through cross-fertilisation with ICT cluster (an enabling technology)
6	Northwest England Northwest Development Agency Cluster Development Programme (UK)	How regional-level cluster programme addresses emerging industries
7	Cluster Evolution In Northwest England from 1700 Onwards	Initiative by regional policy makers to understand how the clusters in the region have evolved to produce the present-day cluster portfolio and anticipate future cluster development
8	VINNVÄXT Programme, <i>Initiatives in early stages</i> (Sweden)	How national-level cluster programme addresses emerging industries
9	Baltic Sea Region Stars – StarDust project	How transnational level programme spurs international cooperation between clusters/innovation nodes – focused on societal challenges
10	Innovation procurement of food for elderly in Skåne Region, Sweden	How region uses public procurement to respond to societal challenges and spur new growth areas

11	INNOVeTION Valley, Veneto Region (Italy)	How an industry-initiated platform supports transformation and renewal of traditional industries/clusters
12	SPITZENCLUSTER Leading-Edge Programme (Germany)	Direct support scheme dedicated to research-driven clusters with the major goal of facilitating emerging industries
13	Technology Strategy Board – TSB (UK): Innovation and Knowledge Centres (IKC)	Shared space and entrepreneurial environment bringing together people from academia and business
14	Knowledge Transfer Networks (KTN)	Network of national clusters that links the supply and demand sides of technology-enabled markets driving new cross-sector and cross-cluster collaborations
15	SMART Programme	Dedicated funding scheme for SMEs to assist them to engage in R&D projects in the strategically important areas of science, engineering and technology
16	CATAPULT centres	New network of centres of excellence that bridge the gap between business, academia, research and government
17	Small Business Research Initiative Programme (SBRI)	Driving innovation through pre-commercial public procurement
18	_connect	Platform for open innovation (online collaboration, networking and knowledge sharing)
19	Technological Research Institutes (Instituts de Recherche Technologique – IRTs, France)	Funding scheme for public-private partnership on research, innovation and education in strategic future sectors, aimed at reinforcing existing competitiveness poles/clusters through creation of Technologic Research Institutes
20	New Zealand Trade and Enterprise (NZTE)	How emerging industries are defined and supported through services rendered by the government agency to individual firms and clusters
21	Identification of emerging industries in Australia	How emerging industries are understood and defined in Australia

Full case studies are available in electronic version only on the website: www.eca-tactics.eu.

1. Identification of new growth areas

20 Various case examples show how different regions and countries approach the task of identifying emerging strongholds and future specialisations.

In some countries or regions new areas of growth have been pre-defined by public authorities (e.g. Northwest England, Spitzencluster Leading-Edge in Germany, Baden- Württemberg Region), most often as broader technology, application or demand areas rather than industries. In other cases this has been decided totally bottom-up, with a focus on opportunities resulting for example from cross-sector or challenge-driven approach (e.g. Catalonia and Veneto regions).

Public bodies are seeking a better understanding of new trends by looking into processes that drive new demand (e.g. in Catalonia Region). They try to understand how the clusters have evolved to produce the present-day cluster portfolio and what factors and what types of factors have influenced this evolution (e.g. North West England Development Agency). This can help discover some processes and patterns of growth that could be used to anticipate future trends. This is an example of how policy actions can explore the past to better understand the future.

Identification process of future growth areas aims at discovering new opportunities resulting from economic, societal or environmental challenges while also involving effective matching of economic strengths of the country/region with other values or assets (e.g. scientific, creative, etc.). Examples of Upper Austria, Veneto and Catalonia Regions can well illustrate such approach.

Clusters initiatives can start and lead a spontaneous bottom-up process of entrepreneurial discovery of new growth areas (e.g. turisTEC Cluster, Veneto Region) that can later be pursued by relevant policy actions.

Tailored policy actions and instruments can provide a structured insight into most promising emerging growth areas where the region/country can be internationally competitive. Such actions can effectively facilitate a bottom-up identification process of new strongholds through cluster organisations and initiatives (e.g. Catalonia, Swedish VINNVÄXT Programme).

Identification of new growth areas requires that broader and flexible cluster concept is considered that may involve other non-statistical criteria such as common strategy, end-user markets, business concepts, cross-industry scope, growth and profitability of business higher than industry average, relevant critical mass, switch from manufacturing to intangible assets, etc. Various policy examples have assumed evolution of cluster concept from industry centred to market/concept grouping, from geographically concentrated to territorially diffused and from industry specific to cross-sectoral.

Identification of emerging areas can come from data which however have certain drawbacks and pitfalls. There is always a danger of being behind the market as data from official sources is back-looking and outdated and can be easily misinterpreted. Relevant statistics are not easy to find and concerned with only quantitative not qualitative dimension. Smart methods for identification of growth areas can be much more useful for this purpose involving intelligence and

bottom-up consultations to discuss with cluster organizations and companies to find out more details about dynamics of the sector and emerging trends (see for instance Catalonia case).

There is no common set of “emerging industries” across the regions/countries in the case studies. There are several common themes in terms of new technologies, markets and changes to societal challenges, e.g. future energy, health & wellbeing, integration of ICT, etc., pre-defined broadly to include companies/clusters from different backgrounds effectively interlinking production sectors/clusters with services. However, in practice these and other

broad labels can refer to the particular specialist technologies and market applications that are important to the region/country. For all ‘emerging industries’, it is important to understand precisely what is meant by the terminology used.

Case examples show that there is a strong overlap between “emerging industries” and Regional Innovation Strategies for Smart Specialisation (RIS3) concepts. It is important to consider both policy approaches at the same time as for some regions/countries they may actually be the same thing (see examples of CATAPULT Centres and Spitzencluster Leading Edge Programme).

KEY LESSONS LEARNED:

- ◆ ‘Emerging industries’ occur at the points where four sets of factors overlap within a region or country:
 - new technologies/business models
 - change in demand
 - the competences of the businesses (rather than their existing product or services portfolio)
 - optimum time to take advantage of business opportunity
- ◆ Cluster organisations and initiatives can help to identify all four sets of factors, in particular the competences of the businesses.
- ◆ Growth areas can emerge from:
 - natural transformation
 - ‘forced’ transformation through policy intervention
- ◆ Policy makers can proactively ‘force’ growth through support initiatives/actions where businesses/clusters have spontaneously transformed.
- ◆ New emerging areas of growth appear at the intersection of different industries effectively matching core manufacturing actors with service actors.

2. Policy support and role of policy makers

22 This chapter introduces the policy issue analysing the role of governments and public agencies. It is based on practical examples of policy mechanisms and support tools that can be relevant to both emerging industries and clusters.

One of the questions from the TACTICS project was: what roles can governments on different levels play to facilitate the emergence of new industries/services? In particular, the following issues were raised and addressed:

- a) How can policy support and catalyse the emergence and growth of new industries/services?
- b) How can clusters be used in this context?
- c) How do policy instruments differ when directed at established vs. emerging industries?

- do the financing level and duration differ?
- do the levels of public support differ?
- does support of the process differ?

The role of policy support in catalysing emerging industries/services (through clusters) have been debated, with one view advocating that policymakers should focus their support on improving specific framework conditions and let the market drive the rest, and the other view being in favour of more pro-active policy approach.

Whereas, the primary role of policy makers is to provide more favourable framework conditions for emergence of new growth areas and specialisations, a set of specific framework conditions that could be relevant to clusters in emerging industries has been presented below:

Demand conditions

Improving demand side of innovation:

- a) more active user participation in innovation processes (user-driven innovation) including consumers, other businesses and public sector as well as individuals and networked communities;
- b) increasing buyer sophistication;
- c) using pre-commercial public procurement;
- d) involving clusters in pre-commercial public procurement (not only as providers but also to help define procurement outlines);
- e) stimulating demand for service innovation;
- f) integrating manufacturing and services.

Research capacity

Upgrading public research base and agendas to facilitate emergence of new competitive industries and specializations:

- a) commercial and social relevance of public research,
- b) transnational collaboration in knowledge transfer;
- c) cross-disciplinary and multidisciplinary research;
- d) thematic or problem-solving oriented programmes/calls (e.g. addressing grand societal challenges/opportunities);
- e) involvement of service companies in RDI projects - more innovation in services;
- f) using clusters to involve larger groups of SMEs in R&D projects;
- g) establishing new channels for R&D public funding (e.g. cluster organizations) to facilitate take-up of technologies and innovative solutions;
- h) involving new groups of innovation actors/consultants in the concept development for R&D projects (e.g. students, users, designers, etc.);
- i) using new methodologies and scientific instrumentation for R&D projects.

Skills and competencies

Skills development and professional training to improve workforce adaptability to new professional profiles:

- a) developing new skills and using life-long learning schemes to update skills to new business models, technological changes, grand challenges, new work organization patterns, etc.;
- b) improving entrepreneurship and business skills:
 - financial competencies and skills to seek and request financing, skills in financial engineering, seeking financing internationally, speaking with potential investors;
 - skills to prepare business plans;
 - skills in IP protection;
 - e-business skills, etc.
- c) developing better staff mobility schemes and programmes (between industries, between universities and businesses, between different geographies);
- d) preparing clear strategies and agendas on new skills and jobs in response to labour market needs;
- e) developing the competencies of users and suppliers.

Legislation

Effective legislation in EU to ensure compliance of regulations and standards:

- a) community level IPR protection (including copyrights, trademarks, protection rights for services, etc. – not just patents);
- b) lower costs of patent obtaining and maintaining;
- c) setting out clear regulations and procedures for establishing research-based spin-off and spin-out businesses;
- d) better and faster standard-setting;
- e) revising and updating state aid rules for RDI.

Financing

Flexible financing for cross-sector high-risk activities and better money raising possibilities:

- a) debt financing instruments for entrepreneurs: risk sharing instruments, different type of lending – e.g. loans with partial write-offs (relief), loan guarantee schemes, providing alternatives to bank lending for SMEs, IP securitisation (using IP as borrowing collateral), etc.;
- b) innovation vouchers – cross-sector and/or cross-border;
- c) tax incentives for R&D;
- d) using cluster organizations as possible operators and channels for funding;
- e) improving access to equity financing in home country and abroad, providing incentives to seed and venture capital and business angels;
- f) promoting alternative opportunities of fund raising – e.g. crowd funding;
- g) better availability of funding opportunities for feasibility studies, proof of market and proof of concept type projects as well as for demonstrators, prototyping, trials and testing, living labs, etc.

Infrastructures and business services

Cross-fertilisation platforms to encourage cross-sectoral, cross-disciplinary and international linkages:

- a) open innovation platforms, platforms for customer/user involvement;
- b) test beds;
- c) prototyping and demonstration facilities;
- d) living labs;
- e) incubators;
- f) knowledge intensive business services;
- g) stimulating collaboration with creative industries (design, simulation, games, etc.).

The issue of framework conditions is one of the topics currently being discussed by the European Forum for Clusters in Emerging Industries (EFCEI), established under the Extension of the European Cluster Observatory, phase 3 (ECO3),⁵ which was launched in the beginning of 2012. The ECO3 project outcomes will include a methodological report outlining and describing a proposal for an indicator system for the assessment of cluster-specific framework conditions for world-class clusters in emerging industries.

Case examples that have been examined show how policy makers engage in different activities to stimulate emergence of new industries and services. In practice the role of policy makers is not limited to improving framework conditions for the emergence of new industries and services, but involves a more pro-active approach consisting in connecting, catalysing, accelerating, promoting, capacity building, disseminating knowledge and information, providing guidance and consultancy, etc.

Whilst there is no methodological agreement across Europe about what emerging industries are and how they should be approached, there is a broad consensus that new specific policy actions and instruments are required to support new areas of growth and industrial transformation. A clear role for policy makers is to remove the barriers that prevent actions being taken quickly.

Policy makers can help shorten time to market and catalyse new areas of growth through proper policy responses. Case examples

show that policy interventions to support emerging industries are primarily focused on:

- emerging areas that the market has already proven to be growing (Catalonia Region, VINNVÄXT Programme);
- areas where regional economic performance is stronger than the national average (e.g. Catalonia Region);
- cross-sector growth areas - for instance matching traditional sectors with creative industries and ICT and/or transformation from manufacturing to more integrated solutions involving services (e.g. Catalonia and Baden-Württemberg Regions),
- high-growth industries based on new disruptive technologies (e.g. Technology Strategy Board),
- growth areas resulting from matching economic and research priorities (e.g. Upper Austria).

Policy makers use other policy approaches, in addition to cluster policies, to stimulate new growth areas and align other policy instruments, for example:

- direct grants and technical support through dedicated services and projects (e.g. VINNVÄXT Programme, Baden-Württemberg Region);
- public procurement of pre-commercial solutions (e.g. Skåne Region, Technology Strategy Board SBRI Programme);
- development of funding schemes (e.g. Technology Strategy Board);
- facilitating access to private investors and helping to bridge the equity funding gap for early stage investment in new entrants

⁵ More information can be sought from PricewaterhouseCoopers <http://www.pwc.be/>

like start-ups and spin-outs (e.g. Technology Strategy Board, New Zealand Trade and Enterprise);

- coordinating the various actions of government departments and aligning existing support across various public bodies (e.g. Technology Strategy Board);
- monitoring public interventions and investment and perform impact assessment on the emergence of new industries and the upgrade of existing ones (e.g. Technology Strategy Board);
- providing process support (e.g. VINNVÄXT Programme, Catalonia Region, New Zealand Trade and Enterprise).

By offering cross-fertilisation and interdisciplinary collaboration platforms, think tanks and labs, public agencies contribute to the involvement of a broad range of stakeholders, enable exchange of information between the demand and supply side, and strengthen the networking of the competencies needed to create value. Examples of policy measures and initiatives include offering a space with proper guidance, facilitation and management, where different communities and people can come together, share knowledge and work creatively. Policy makers facilitate analyses and studies, information exchange and sharing, and enable development, experimenting, testing, validating and exploring of new ideas, concepts and approaches (e.g. Baden-Württemberg Region, Technology Strategy Board _connect). Policy initiatives help engage users (corporate, individual and public) and promote customer empowerment in innovation processes, by providing/facilitating access to living labs and demonstration/testing platforms.

Examples of policy measures show that more flexible time frames are applied to projects related to new areas of growth in order to give room to explore and test new ideas/approaches (e.g. SMART Programme of TSB, VINNVÄXT Programme, 'Initiatives in early stages').

Also direct financing dedicated to emerging areas seems to be more flexible when compared to financing for established industries:

- phased approach with regard to project selection and funding (e.g. VINNVÄXT Programme, 'Initiatives in early stages', Spitzencluster Leading Edge Programme);
- possibility of financing different stages of the same project (e.g. SMART Programme);
- leveraging funding from a variety of national and regional sources (e.g. Spitzencluster Leading Edge Programme, Technology Strategy Board).

Examples of policy role include mobilization of existing physical research infrastructure and providing support for long-term investment in capital-intensive experimental, demonstration and testing infrastructure in order to create a base for improved knowledge transfer and sustained collaboration across industries and to stimulate transformation of existing clusters/industries pointing them towards the potential of emerging technologies and new market opportunities (e.g. TSB CATAPULT Centres).

Policy measures stimulating demand side innovation are primarily focused on addressing societal challenges through pre-commercial procurement.

In pre-commercial procurement a major objective is to solve a specific societal problem (e.g. Skåne Region) and the role of public authorities in this process can include the following:

- define the problem;
- provide a critical mass on demand side;
- build partnerships;
- seek involvement of different suppliers including leading cluster and other stakeholders;
- provide incentives to suppliers to make them involved in the procurement specification development process.

Policy initiatives on pre-commercial public procurement are aimed at stimulating private sector to develop specific solutions that can catalyse the emergence of new products and/or services and create market niches. Business-driven answers to specific challenges are being sought with the public sector having a role of a change agent.

Policy actions on pre-commercial procurement can also include process support for the capacity building and skills development

(e.g. Skåne Region). Public support is provided to enterprises, especially SMEs, to prepare them for competitive bidding for public procurement. This includes improving their capabilities to cooperate and create partnerships through activities that bring together companies and clusters from various sectors with the objective to find partners for developing joint solutions and setting up projects.

Case examples show that process support can be offered as a complementary action to direct grants (e.g. VINNVÄXT Programme) or as a separate measure if direct funding for clusters is not available (e.g. Catalonia Region). Process support, in a form of training modules, individual coaching, workshops, etc., is aimed at capacity building for cluster organisations and initiatives to help them mobilize different people and organisations to share the same strategic idea. It can also improve skills on communication of new growth strategies, visibility and re-branding.

28 2.1. RELEVANCE OF EXISTING POLICY MEASURES AND ACTIONS AT THE EUROPEAN COMMUNITY LEVEL

The TACTICS project has highlighted a number of policy measures and actions that could provide relevant support to catalyse emerging industries/services on EU level.

Some existing European programmes and initiatives offer various opportunities for cross-fertilization, new types of collaboration and public-private partnership, thus being suitable for catalysing the emergence of new areas of growth and industrial renewal. At the same time, if not directly targeting clusters, they offer potential for involvement of clusters and cluster organizations.

Examples of such policy concepts and instruments with high relevance are given below.

1) Smart Specialisation

<http://s3platform.jrc.ec.europa.eu/home>

Both clusters and emerging industries are highly relevant to the smart specialisation concept. Moreover, as for some regions/countries smart specialisations could be equal to new areas of growth, the two policy concepts are interlinked and overlapping. Smart specialisation means that innovation strategies must take into account regional strengths and assets, including clusters. Clusters are at the core of smart specialization due to their

inherent capability of providing fertile innovation environment and critical mass by enabling interactions between different innovation actors. Clusters can help to identify relevant SMEs and increase their involvement in the entrepreneurial process of uncovering the specific potential of a region in terms of the new areas of growth and specialisation niches that can emerge at the intersection of established sectors.

Clusters will be involved in Research and Innovation Strategies for Smart Specialisation (RIS3) in the designing and implementation stages. They will be used to identify specialization and co-location patterns that would help to understand the current structure of the regional economy and define those unique strengths and opportunities for regions that are essential to achieve competitive advantage, as well as to set priorities for regional development.

Clusters can be used as one of policy delivery instruments for RIS3 offering effective cooperation platforms enabling quick delivery on smart specialization objectives. Cross-sectoral and inter-cluster collaboration offers new innovation opportunities for the region to build competitive advantage. In particular, through cross-sector collaboration clusters can contribute to the implementation of thematic-based strategies addressing new societal challenges, and creating new competitive advantages in a region.⁶

⁶ Guide on regional/national Research and Innovation Strategies for Smart Specialisation (RIS3).

2) Lead Market Initiative (LMI)

<http://ec.europa.eu/enterprise/policies/innovation/policy/lead-market-initiative/>

The Lead Market Initiative is an example of European policy support for demand side of innovation targeting six important sectors through actions aimed at lowering the barriers to bring new products or services into the market. The strategic goal is to foster the emergence of global markets of high economic and societal value where Europe could take a leading position.

The policy tools applied under LMI include regulation, public procurement, standardisation and complementary actions. The European Commission, Member States and industry have worked together to carry out the action plans for the following identified Lead Markets: eHealth, Protective textiles, Sustainable construction, Recycling, Bio-based products and Renewable energies.

Clusters fit with LMI goals as they can contribute towards the success of R&D using economies of scale and network effects and improving exchanges between companies, technology centres and users.⁷ Action plans drawn up for all lead markets have included increased collaboration with users on product/service development stage through clusters, as well as encouraging the development of clusters and other forms of local collaboration. Involvement of clusters has been later supported by such instruments as CIP

⁷ Final evaluation of Lead Market Initiative: http://ec.europa.eu/enterprise/policies/innovation/policy/lead-market-initiative/files/final-eval-lmi_en.pdf

and FP7, inter alia under Regions of Knowledge tool (Capacities), supporting cooperation of regional ‘research-driven clusters’ across Europe.

A different understanding of the cluster concept in LMI has been proposed in the Esko Aho Report *Creating an Innovative Europe* (January 2006), to define clusters in terms of the new market and knowledge relationships needed for emerging sectors to flourish. This involves opening traditional clusters to cooperation with and learning from other clusters in the same or other sectors, to help companies in traditional sectors find innovative growth paths by forming new linkages and applying new technology to their existing products and services. However, reinforcing traditional sectoral clusters has not been recommended and is even seen as counter-productive.⁸

3) Knowledge and Innovation Communities (KICs)

<http://eit.europa.eu/kics/>

KICs are highly integrated, creative and excellence-driven partnerships established under the European Institute of Research and Innovation (EIT) and aimed at producing innovations and new innovation models. KICs, that need to be run with clear business objectives, bring together different stakeholders including higher education, research and technology, business (including SMEs), public investors and investment communities, research funders

⁸ See Esko Aho Report *Creating an Innovative Europe*: http://ec.europa.eu/invest-in-research/pdf/download_en/aho_report.pdf

30 and local/regional and national governments. KICs build innovative webs of excellence with the intention of addressing key societal challenges.

Clusters can help bridging the gap between research and market under KICs, with cluster organizations being referred to in the EIT Strategic Innovation Agenda as key stakeholders.⁹ Through the promotion of new interactions between all innovation actors, the nodes of KIC webs will build upon excellent regional clusters thus helping to raise their global competitiveness. Through co-location centres, where people with different backgrounds can meet around common objectives, strong local actors, including clusters, are offered the opportunity to closely link with other excellent partners across borders, thus being able to act and be recognized globally.

Clusters and cluster organisations can play an important role in the development of the strategic agendas of KICs. Their involvement would ensure meaningful collaboration and coordination between key actors: academics, industrial research teams and companies thereby increasing the possibilities for development of new industries and services. According to the Strategic Innovation Agenda, EIT will make systematic efforts to use existing cluster organisations as platforms for the knowledge exchange and dissemination of results. Linkages between KICs and local cluster organisations could also be strengthened with the objective of increasing the involvement of SMEs in the activities of the KICs.

⁹ http://eit.europa.eu/fileadmin/Content/Downloads/PDF/EC_SIA/proposal-for-decision-sia_en.pdf

4) European Innovation Partnerships (EIPs)

http://ec.europa.eu/information_society/activities/einclusion/deployment/ahaip/index_en.htm

The European Innovation Partnership (EIP) is a new concept introduced under the Europe 2020 flagship initiative *Innovation Union* with the objective of speeding up innovations that can make a significant contribution to solving societal challenges, through improving the European research and innovation system. EIP is not a new programme or funding scheme but is intended to pool public and private resources and expertise on key political priorities by mobilising and linking up all relevant stakeholders across policies, sectors and borders to maximize the use of existing resources and bring the benefits of breakthroughs and innovation to people more quickly.

Operating across the whole research and innovation cycle by bringing together all relevant actors on EU, national and regional levels in a challenge-driven approach, EIP offers a huge potential for the renewal of the sectors involved, as well as for creating entirely new industries and services. Partners are expected to deliver on the following main tasks:

- set-up research;
- coordinate investments in demonstration and pilots;
- anticipate and fast-track any necessary regulation and standards;
- mobilize demand.

Five EIPs have been established to date, including the pilot EIP on *Active and Healthy Aging* under DG INFSO (the other

partnerships are *Raw Materials, Agricultural Sustainability and Productivity, Smart Cities and Communities and Water*).

Being apparent stakeholders of EIPs, clusters can mobilize companies, including small and recently created businesses that have limited capacity and recognition on their own, thus helping to achieve balanced representation between large multinationals

(i.e. market leaders) and SMEs. Clusters are able to contribute effectively to the development and implementation of the Strategic Implementation Plan of EIP, enhancing collaboration between large companies and SMEs as well as among SMEs themselves. Clusters can also be involved in R&D projects and standard setting activities as well as in large scale demonstration projects that prove the viability of newly developed solutions.

KEY LESSONS LEARNED:

- ◆ Public authorities consider clusters to be an effective policy tool that can be used to support a strategic industrial transformation through adjusting the policy response.
- ◆ An important role of policy makers is to follow the trends that market has already proven to be growing proactively approaching the growing segments of declining sectors.
- ◆ Cluster development programmes have to be multidimensional representing a matrix of technology, markets and business sectors of strength.
- ◆ Cluster organisations and initiatives can improve the impact of public interventions by increasing involvement of SME in EU programmes and policy initiatives aimed at catalysing the emergence of new areas of growth and transformation of existing industries.
- ◆ Pre-commercial procurement enables creation of new sectors of industrial leadership through structured innovation within public services addressing societal challenges.

3. Role of cluster organizations

32 This chapter, based on case examples, is trying to explore what role cluster organisations have in emerging industries/services, what services and support are offered to cluster companies and what activities are especially relevant if compared to traditional sectors.

Cluster organisations can help spot and commercially exploit new technologies, business models or income strategies being well placed to ensure that action is taken at the optimum time to take advantage of market opportunities.

Quality services delivered by those organizations to cluster constituents can make them better prepared for new challenges resulting for instance from consequences of new disruptive technologies that affect the cluster/industry. Cluster organisation can help re-define business and industry to give the cluster a new strategic focus involving cross-sector linkages, so the cluster will be able to evolve and regain its competitiveness.

Case examples show that some cluster organisations have developed one-stop-shop approach where some services are rendered by cluster organizations themselves, while some other highly-specialized services needed for every phase of product lifecycle are sought from other entities through long-term collaboration networks (e.g. early stage financing, financial advice, technology advice, drafting business plans, validation of new solutions, specialized studies and analyses, patenting and patent management, etc.).

Facilitating access to equity financing and public funding mechanisms is of utmost importance for cluster firms to implement their new growth strategies and launch high risk projects. Cluster organisations help match high growth companies with private investors, identify funding opportunities at regional, national and EU levels, access grants and apply for project funding.

Support offered by cluster organizations to strategic business development can help companies with the renewal and upgrade of their existing profiles. Such services include delivering one-to-one consultations for business improvement, assisting companies with strategic business plans, re-branding and promotion on new markets.

Services delivered by a cluster organization can include promoting open innovation and user involvement and linking demand with supply side by establishing, operating and coordinating open innovation and meeting arenas (e.g. cross-fertilization and collaboration platforms, testing/demonstration infrastructures, prototype factories, business labs, etc.), linking national partners through such arenas, initiating projects and initiatives for user involvement in innovation processes and connecting to virtual platforms and resources like test beds for new products/services and qualifications.

Defining new specific skills and competencies needed for emerging sectors can be effectively done through cluster organisations which can help improve existing human resources by providing specialized training programmes for cluster firms.

The role of cluster organisations is to inspire and explore collaboration opportunities with other industries, identify cross-sector trends and themes and initiate collaboration with other cluster groups in the region/country or transnationally, linking the cluster companies with other sectors and research organisations to seek complementary competencies.

Cluster organisations vary considerably across Europe and therefore a wide variation of support and services are provided by individual cluster organisations. The types of support and services that are particularly relevant to encouraging the growth of emerging industries are presented below.

Type of support	Services
Networking	<ul style="list-style-type: none"> • Connecting and involving a broad range of stakeholders • Strengthening the competencies of cluster businesses to create value, by actively facilitating cross-sector and inter-cluster networks at local, national and international levels
Knowledge Base	<ul style="list-style-type: none"> • Providing easier access to academia and the research base for businesses, in particular SMEs
Innovation	<ul style="list-style-type: none"> • Catalysing the creation of innovative ideas • Accelerating the adoption of innovative ideas at all levels • Capacity building within businesses • Facilitating the exchange of information between the demand and supply side • Encourage the public procurement of pre-commercial solutions • Facilitate the growth of user driven innovation • Encourage the creation and development of start-ups and spin-outs • Facilitate the access of businesses to cross-fertilization platforms, living labs, pilot plants, demonstrators and other innovation infrastructure
Raising Awareness	<ul style="list-style-type: none"> • Disseminating knowledge and information • Providing guidance
Marketing & Branding	<ul style="list-style-type: none"> • Promoting the cluster in new growth markets, including those related to meeting societal challenges
Representation including Lobbying	<ul style="list-style-type: none"> • Representing the cluster on relevant bodies at regional, national and European levels where appropriate

	Some cluster organisations cannot undertake lobbying activities because of constraints applied by their funding bodies. If lobbying is permitted, represent the consensus of views of the cluster members to politicians, and to relevant influential bodies.
Skills	<ul style="list-style-type: none"> • Improve the availability of a workforce with the new skills needed by defining new specific skills, providing or influencing training (including vocational and workplace training) and educational programmes and curricula in collaboration with professional organisations.
Access to Finance	<ul style="list-style-type: none"> • Direct grants and technical support through dedicated services and projects • Development of funding schemes • Facilitating access to investors, equity financing and public funding
Project Management	<ul style="list-style-type: none"> • Initiating, evaluating, coordinating and managing projects undertaken jointly by cluster members

As stated above, cluster organisations will not provide all of this support or services, but they are a menu from which the cluster organisation can select according to local needs and opportunities. The case studies illustrate how this works in practice.

KEY LESSONS LEARNED:

- ◆ Important role of cluster organisations is to help enterprises identify new business opportunities emerging from new technologies, new business models, changes in market demands, linking different industries, etc.
- ◆ Cluster organisations can help seek complementary competencies for the cluster by actively facilitating cross-sector and inter-cluster collaborations (e.g. with creative clusters).
- ◆ By offering services dedicated to creation and development of start-ups and spin-outs, cluster organisations can effectively contribute to commercialization of new ideas and creation of new products and markets.
- ◆ Cluster organisations can help regional/national authorities understand new trends and transformation processes in the industry and design a proper policy response.

Conclusions and recommendations

CONCLUSIONS

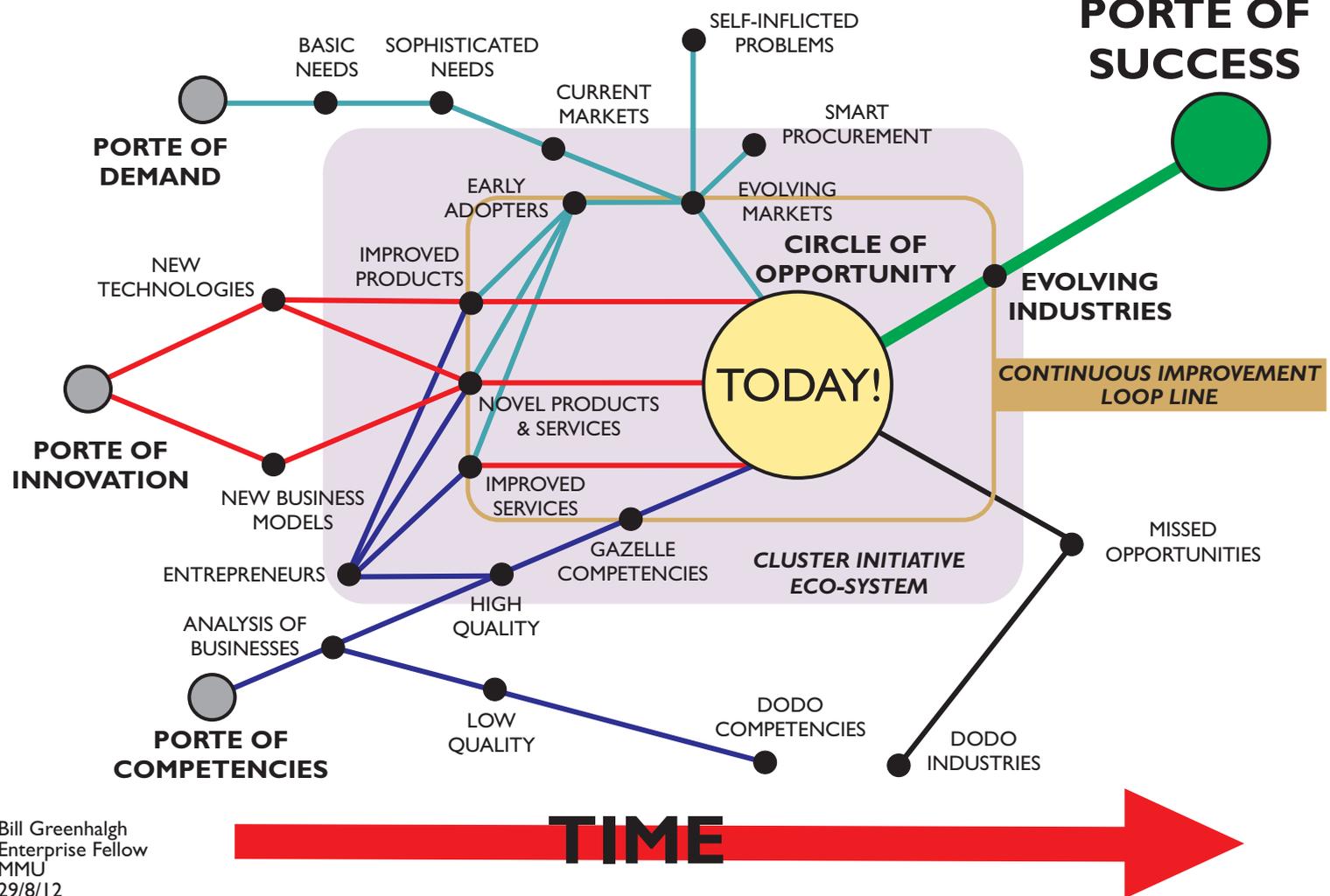
There is no consistent and accepted definition of 'emerging industries' neither a methodological agreement on how to identify them. It is important to distinguish between a new technology, or business model, and an 'emerging industry' as they are not the same thing.

Some experts understand emerging industries as completely new industrial sectors based on new technologies/business models or as existing economic activities that undergo transformation into new industries. Other experts are in favour of the concept that an emerging industry has to be considered as emerging in the context of certain region or country or market, and which is therefore not totally new or upgraded.

The metro diagram below represents an attempt at describing the 'emerging' industries process.

The diagram is based on a map of the Paris Metro system where the original Metro lines start and end at the old gates of the city, the various Portes. The diagram therefore starts at three Portes for the three factors that have to be considered in identifying an "emerging" industry, i.e. Demand, Innovation and Competences of the businesses. The three things come together in the 'Circle of Opportunity' which is where the 'emerging' industries are identified. These then evolve and lead to the Porte of Success. The Continuous Improvement Loop Line indicates the need to refine and revisit markets, products and competences as 'emerging' industries develop. The large red TIME arrow is to emphasise not only that this is a process, but that timing is crucial to success. The shaded area represents the cluster initiative eco-system.

“EVOLVING INDUSTRIES”: THE METRO MAP



The Case Studies and other material investigated under the TACTICS project, identify a range of programmes at regional and member state level which target 'emerging industries' of 'emerging' technologies. These are listed below.

Case example	Technologies / markets
European Innovation Partnerships	<ul style="list-style-type: none"> • Active & Healthy Ageing • Raw Materials • Agri Sustainability & Production • Smart Cities • Water
Spitzencluster Leading Edge Programme	<ul style="list-style-type: none"> • Climate • Health / Nutrition • Mobility • Security • Communications
Medien und Filmgesellschaft Baden-Württemberg (MFG)	<ul style="list-style-type: none"> • Creative Industries • Visual computing • Visual experience
Baden-Württemberg Region	<ul style="list-style-type: none"> • New Materials / Surfaces • Media • Logistics • Aerospace • Satellite Technologies • Security • Telecomms • Energy

<p>Instituts de Recherche Technologique – IRTs) (France)</p>	<ul style="list-style-type: none"> • Nano-electronics • Aeronautics, space and embedded systems • Microbiology, infectology and infectious diseases • Materials, metallurgy and processes • Rail infrastructure • Composite materials <p>Also considering:</p> <ul style="list-style-type: none"> • Digital System Engineering • Networks and Digital Infrastructures
<p>Veneto Region</p>	<ul style="list-style-type: none"> • Creative industries
<p>BSR Stars</p>	<ul style="list-style-type: none"> • Cleantech • Well-being • Transport • Digital Services
<p>Vinnväxt Programme</p>	<ul style="list-style-type: none"> • Biofuels • Winter Sports • Printed Electronics • Smart Textiles
<p>Skåne Region</p>	<ul style="list-style-type: none"> • Services for the elderly
<p>Catalonia</p>	<ul style="list-style-type: none"> • Fashion textiles • Kids products
<p>Spain</p>	<ul style="list-style-type: none"> • Tourism
<p>Upper Austria</p>	<ul style="list-style-type: none"> • Energy efficiency • Energy management • Renewable energy

UK Catapults	<ul style="list-style-type: none"> • High value manufacturing • Cell therapy • Offshore renewable energy • Satellite applications • Connected digital energy • Future cities • Transport systems
Northwest England	<ul style="list-style-type: none"> • Biomedical • Digital & Creative Industries • Environmental Technologies • Renewable Energy • Financial & Professional Services • Tourism (Visitor Economy) • Chemicals (Specialty chemicals and new processes) • Advance Flexible Materials (Technical Textiles) • Aerospace (Autonomous vehicles, composites, fuel efficient engines) • Automotive (Prestige cars, green vehicles) • Food (Advanced food processing, functional foods)
Lead Markets Initiative	<ul style="list-style-type: none"> • eHealth • Sustainable Construction • Protective textiles • Bio-based products • Recycling

40 The range of targets is quite broad although a number of the targets are identified by several regions or member states. From the list of targets it can be seen that:

- There is a mixture of markets, enabling industries (which can serve several markets) and platform technologies.
- This mixture may be the result of analysing programmes with completely different aims and objectives. However, it could possibly indicate that some regions and member states recognise the importance of establishing a pipeline of new platform technologies and enabling industries to meet future market needs.
- The mixture also shows that some changes are being driven by technology push whereas the others are being driven by demand pull. Greater involvement of users in demand, products/services,

innovation and clusters could increase the speed with new demands are met.

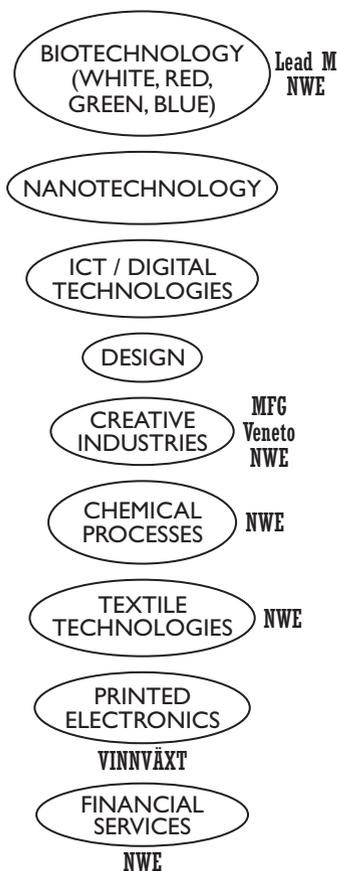
- Several markets fit with the societal challenges identified in the Europe 2020 strategy.
- Almost all the terms used to describe the targets are very broad. Further work is needed to determine whether this means that an opportunistic approach is being taken, or if there will be a high degree of focus on niche parts of the targets.

The 'Evolving Industries' diagram below groups the targets together as either Evolving Platform Technologies, Enabling Industries (Means to an End), or Markets (Meeting Societal Challenges). Several broad themes can be identified such as Health & Well-being, Resource Utilisation also linked to Climate Change and Sustainable Transport.

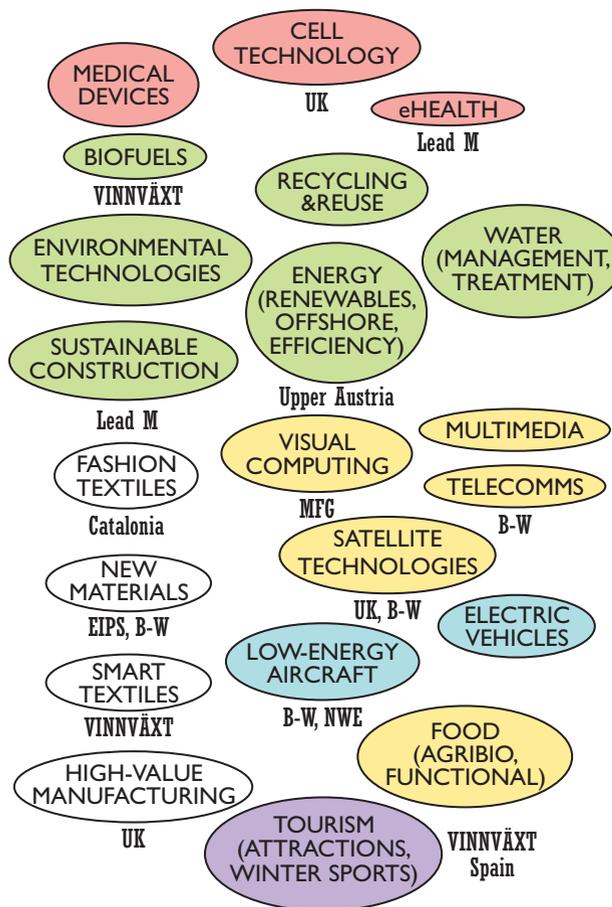
“EVOLVING” INDUSTRIES

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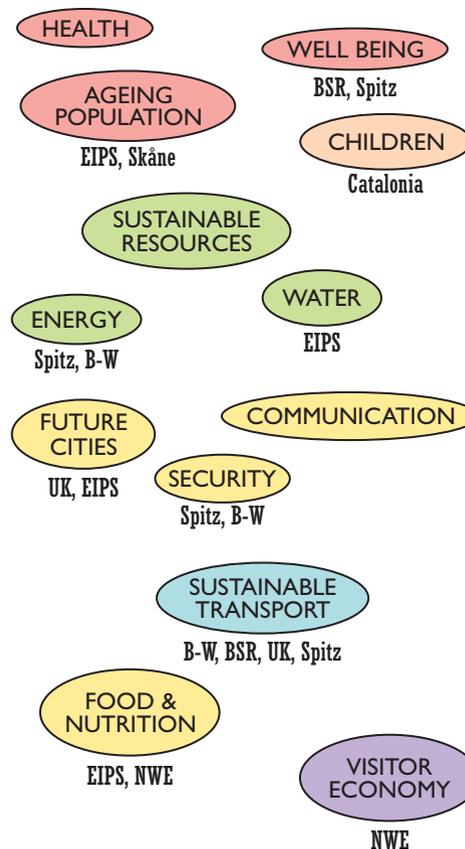
EVOLVING PLATFORM TECHNOLOGIES



MEANS TO AN END



MEETING SOCIETAL CHALLENGES



42 POLICY RECOMMENDATIONS

These policy recommendations on catalysing emerging industries through clusters have been produced as a result of dedicated hard work by Reflection Group members, the project partners and other cluster experts and summarized from inputs received and discussions held during workshops and meetings.

1) Smart observation and identification of new growth areas

Smart observation is needed for better understanding of new growth areas. A more proactive role of policy makers in identifying and stimulating emerging areas is recommended versus simply improving framework conditions.

Published data for this purpose is of very limited use as this is invariably out of date and is designed for existing businesses, sectors and employment practices. In order not to act on old information being always behind the market, policy makers need to apply smart observation approaches involving combinations of methods. Foresight and other analyses on future market opportunities as well as mapping of cluster/industry evolution over time could help to understand processes of growth.

Smart observation methods can include using intelligence and bottom-up consultations (e.g. interviews at universities, economic chamber of commerce, training sessions, expert panels, etc.) along

with data to identify emerging areas. Identification processes should involve effective matching of economic strengths of the country/region with other values or assets.

Policy makers should focus on new growth areas that the market has already proven to be growing as opposed to initiating/picking up new areas. New creative ways should be sought to involve cluster organizations and cluster actors in the early identification of emerging trends that help companies exploit new business opportunities emerging from such factors as new technologies, new business models, changes in demand, linking between different industries and between industries and services.

The role of policy makers is to find new creative ways to identify growth areas. For instance they can raise awareness on the importance of using new methodologies for preparing R&I projects like consulting alternative expert groups like students or designers who can contribute different perspectives/expertise and help identify interesting market/business opportunities. Another example of innovative approach could be organizing informational or training sessions or 'open innovation events' to spread intelligence and highlight renewal/transformation opportunities as well as disseminate best practices. Consumer empowerment is needed to develop more sophisticated demand and help citizens and communities get better value.¹⁰

¹⁰ See the guide on user-driven innovation produced under the TACTICS project: *User-Driven Innovation, Involving excellent Clusters* www.eca-tactics.eu

2) Support to inter-clustering and cross-fertilization

In order to catalyse new areas of growth, activities should be taken to support cross-fertilisation between clusters across sectors/disciplines and across geographies. This could include thematic platforms, sometimes focused on 'grand societal challenges', that bring research and innovation actors/environments together, as well as programmes aimed at linking different existing clusters that can complement each other. The EU-level should stimulate new combinations of networking and partnerships between cluster initiatives; through for example match-making events or calls focused on thematic issues or societal challenges that require multiple sectors and complementary skills to be involved.

By facilitating access to cross-fertilization platforms, public authorities can help involve a broad range of stakeholders and improve exchanges between demand and supply side of innovation.

Impact assessment of policy mechanisms and actions is needed to help design policy instruments that better address new challenges and opportunities.¹¹ Support packages facilitating new business opportunities should be made more effective through combination of financing and technical support.

Cluster programmes should be initiated in sectors where regional economic performance is stronger than the national average or

where niches have been identified with strong focus on cross-sectoral collaboration. Public interventions should catalyse processes that are already underway. To successfully foster emergence of new industries and services, cluster development programmes have to be of multidimensional nature, pursuing a matrix of science/technology, markets and business sectors of strength. Working with emerging growth areas is a medium-term process and investment. In contrast to traditional industries where public interventions are justified by market, system or policy failure, in emerging industries public interventions are rather justified by market opportunity.

International cluster cooperation can play an important role for emerging areas of growth, however this depends on the sector (e.g. it is particularly relevant in case of societal challenges and/or development of worldwide standards and guidelines).¹²

More focus has to be put on application sectors as growth areas can often emerge from new applications rather than from novel enabling and industrial technologies. Answers to grand challenges can be provided not only by breakthrough technologies but also by new applications resulting from cross-fertilization and inter-cluster collaboration.

Industries that represent potential for stimulating productivity in other sectors, like for instance creative industries (especially

¹¹ See another TACTICS document -the guide *Impact evaluation of cluster-based policies*: www.eca-tactics.eu

¹² See *Cluster internationalization* handbook prepared under TACTICS project: www.eca-tactics.eu

44 design, but also simulation, games, etc.) and ICT, should be pro-actively matched with other sectors/clusters to spur new market opportunities.

As service innovation can create new business opportunities for companies from very different backgrounds and can therefore facilitate the transformation and renewal of clusters and whole industries, growth opportunities resulting from linking industrial sectors with services should be exploited.

Cluster organizations should promote open innovation and user involvement by facilitating access to cross-fertilization platforms and other testing/demonstration infrastructures. They should also seek complementary competencies by actively facilitating collaboration with other sector and clusters. Cluster organizations should also work closely with the agencies which attract foreign direct investment as a means of stimulating emerging areas within the cluster or with other clusters.

3) Broader EU policy context

It is recommended to integrate emerging industries/services and clusters in a broader context of EU policy areas like for instance Regional Innovation Strategies for Smart Specialisation (RIS3). Matching economic and scientific fields of strength and working on cross-sectoral networks should be promoted to help clusters and regions identify areas of specialization/niches.

Participation of SMEs through clusters in European initiatives and projects should be promoted as well as channelling of RD funding through excellent cluster organisations.¹³ In order to speed up renewal of European industry, involvement of cluster initiatives should be pursued in existing cross-sectoral, transnational collaboration project opportunities that bring together private and public sectors such as Lead Market Initiative and initiatives of European Research and Technology Institute (EIT). There should be a strong focus on creating value by delivering integrated new solutions.

4) New financing approaches

New financing approaches are needed to support emerging industries through excellent clusters. If compared to established industries, projects in emerging industries need more flexible approaches in both selection and funding. As different phases of growth require different level of resources, phased financing approaches are needed to filter through ideas over time with initial financing targeting short-term activities (like for instance feasibility studies for emerging areas within clusters or pre-commercialization phase) while later stages of financing (that can come from multiple sources) target longer-term activities with a continuation of financing conditional on performance milestones.

To spur new areas of growth, more funding opportunities should be available for feasibility studies, proof of market and proof of concept type projects with financing available for different

¹³ See TACTICS paper *Channelling RDI funding through clusters*: www.eca-tactics.eu

stages of the same project. Programmes and schemes should be offered for funding demonstrators, prototyping, trials and testing, etc. It is also recommended to improve access to risk finance and apply new funding mechanisms such as guarantee schemes, innovation vouchers (cross-sector and/or cross-border), risk-sharing facilities, etc.

Support packages could be made more effective through combining financing and technical support for instance for strategic change and new growth strategies and cluster marketing and branding.¹⁴

Emergence of new industries and services should be supported by public procurement with a strong focus on pre-commercial procurement transactions where procedures are better oriented towards using cluster initiatives. Better links with clusters are

needed to understand what they can provide and educating/training SMEs would help them understand how they can work together and respond to public procurement calls. Clusters can be also involved to help define the procurement outline.

Other examples of support can include financing external studies on market potential and opportunities for cross-clustering and external strategic advisory support, as well as for coaching/facilitation of clusters/innovation networks in emerging areas, financing use of new methods for R&I collaboration, etc.

Innovation Express (IE) should be continued as an established funding mechanism and recognized brand for inter-cluster collaboration with a focus on emerging industries/services in future calls for proposals.

¹⁴ See TACTICS handbook on cluster marketing and branding: www.eca-tactics.eu

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Linkology

Austria

TMG, Upper Austria

Website: http://www.tmg.at/index_eng.php

Belgium

IWT, Flanders, Belgium

<http://www.iwt.be/english/welcome>

Denmark

Copenhagen Cluster Excellence Declaration:

<http://www.clusterexcellence.org/download-material.html>

France

Côte d'Azur Chamber of Commerce, France

www.cote-azur.cci.fr

Oséo, France

<http://www.oseo.fr/international>

Germany

The Institute for Innovation and Technology in

Germany & the European Clusters Go

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<http://www.vdivde-it.de/publications/best-practice/european-clusters-go-international-2013-net-works-and-clusters-as-instruments-for-the-initiation-of-international-business-cooperation>

MFG Baden-Württemberg mbH, Germany

<http://www.mfg.de/english/>

VDI-VDE, Germany

http://www.vdivde-it.de/?set_language=en&cl=en

Greece

Corallia, Greece

www.corallia.org

Italy

Filas, Lazio, Italy

<http://www.filas.eu/>

Japan

Japan – EU-Japan Centre for Industrial

Cooperation

www.eu-japan.gr.jp

Korea

KICOX (Korea Industrial Complex Corporation)

<http://www.e-cluster.net/en/>

Poland

Polish Agency for Enterprise Development

(PARP)

www.parp.gov.pl

Sweden

BSR Stars, Sweden

<http://www.bsrstars.se/>

Medicon Valley Alliance Life Science Ambassador Programme

<http://www.ambassadorprogramme.com/>

VINNOVA, Sweden

<http://www.vinnova.se/en/>

Europe General

CLUNET INNO Net project on the PRO INNO website at:

<http://www.proinno-europe.eu/clunet/publications>

DG Enterprise

<http://www.proinno-europe.eu/cluster-excellenceeu/newsroom/helping-smes-go-global-through-clusters>

ECPG Recommendations:

<http://www.proinno-europe.eu/ecpg/newsroom/ecpg-final-recommendations>

EFQM

www.efqm.org/en

ERRIN

<http://errin.eu/en/>

Eurada

<http://www.eurada.org>

Europa InterCluster

<http://www.intercluster.eu>

Europe 2020

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http://ec.europa.eu/research/innovation-union/index_en.cfm

http://ec.europa.eu/enterprise/policies/industrial-competitiveness/industrial-policy/index_en.htm

European Aerospace Cluster Partnership

<http://www.eacp-aero.eu>

European Automotive Strategy Network

<http://www.easn.eu/>

European Cluster Alliance

<http://www.proinno-europe.eu/eca>

European Cluster Collaboration Platform

<http://www.cluster-excellence.eu/eccp.html>

European Cluster Excellence

www.cluster-excellence.eu/

European Cluster Managers Club

<http://www.cluster-excellence.eu/club.html>

European Cluster Observatory

<http://www.clusterobservatory.eu/index.html>

European Enterprise Network

<http://www.enterprise-europe-network.ec.europa.eu>

The Nordic-German-Polish (NGP) Cluster

Excellence Benchmarking from the NGP

Copenhagen Conference 2011:

<http://www.clusterexcellence.org/download-material.html>

Scottish Enterprise Cluster Dynamics model that Ekos have refined further:

http://ekstranett.innovasjon Norge.no/NCE_fs/Cluster%20Dynamics%20Final%20Report%20Sep%2008.pdf

<http://www.tci-network.org/activities/dynamics>

<http://www.bsrstars.se/stardust>

TACTICS and the TACTICS Reflection Group Task Force on Fostering International Cluster Cooperation:

<http://www.proinno-europe.eu/eca/page/tf1fostering-international-cluster-cooperation>

Taftie

<http://www.taftie.org>

The Competitiveness Institute (TCI)

<http://www.tci-network.org/>

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TACTICS RESULTS

TACTICS gives a fresh outlook on trends in cluster policy and provides a toolbox to policy makers and practitioners on how to better use clusters for economic development, through a set of documents:

- **Key messages and practical recommendations from the TACTICS project**
highlights three key messages for policy makers with recommendations on concrete actions and implementation. The document is based on cluster trends in Europe and conclusions from TACTICS' six task forces.
- **Cluster internationalisation**
The handbook provides a practical guide, illustrated with tools and case studies, for policy makers and cluster managers to address the "Why?" for internationalisation and to progress through the ten steps of the Internationalisation Journey.
- **Cluster marketing and branding**
The handbook examines different cases of cluster branding strategies with a view to draw useful recommendations for policy makers, bringing about concrete suggestions for the improvement of cluster policies.
- **Impact evaluation of cluster-based policies**
The guide suggests concrete steps for setting up an evaluation process of cluster-based policies. The document, targeting policy makers and other cluster stakeholders, is a practical guide supported and explained by several cases.

- **Fostering User-Driven Innovation through clusters**

The guide provides practical advices for cluster organizations to support their member companies with the implementation of User-Driven Innovation and recommendations to policy makers to develop and implement appropriate policies.

- **Channelling RDI funding through clusters**

The paper proposes a focus on the capacity of clusters/cluster organisations to attract and manage RDI funding, including new activities, actors and the role within smart specialisation strategies. It also provides TACTICS' contribution to the State Aid rules consultation for clusters.

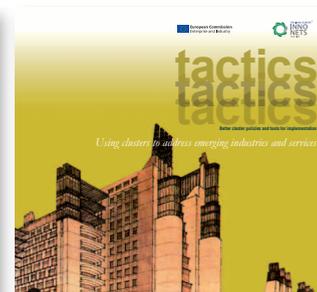
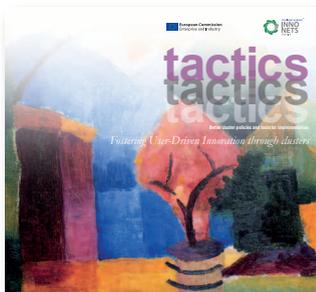
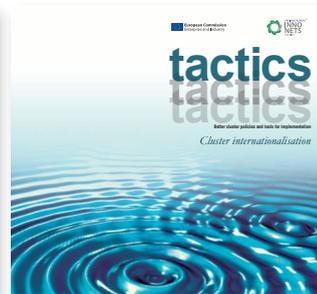
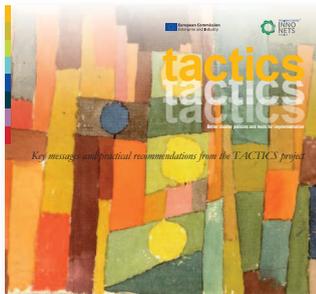
- **Using clusters to address emerging industries and services**

The paper tackles the issue of using clusters to catalyse emergence of new industries and renewal/upgrade of well-established ones. The document summarizes case examples and discussions held with participation of TACTICS partners and external experts.

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The paper includes contributions from about 30 European regional and national policy making organisations, and highlights the trends in the use of clusters as a tool for innovation and economic growth, today and in the future.

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