CLUSTRAT

Discussion Paper on Emerging Industries

2nd Draft

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December 2011

Todays innovation policy maker have to look into the future and define measures, that will support their industries (industrial sectors including service industries) to not only survive but be prepared and be or stay competitive. Cluster policy was and is a key policy instrument to support this.

Thus, clusters have developed and policies have tackled their start-up , their professional management or their excellence performance. Most existing clusters today are born from todays market demand sectors (materials, packaging, manufacturing, tourism, etc.) or technology demand sectors (ICT, Mechatronics, etc). There was little inter-linkage between the two, or at least little policy to support and make inter-linkages happen.

The new challenges of society bring a new dimension into the picture. For example the demographic changes will lead to more elderly people, who want to stay healthy and active. This will create new market sectors, new demands in terms of healthier food, health care services and health care technologies. This market demand could be summarized in an emerging sector or emerging industry called healthy aging.

To be prepared for this market, the existing cluster portfolios are no longer sufficient. The emerging sectors ask for innovations in the cross-cutting edge of traditional market sectors, technologies and services. Key enabling technologies have to find their way into those different cluster types in such a way, that the necessary products and services development can actually happen and finally find their way into the market.

The mission of CluStrat is to make this happen!

In the following pages, we will elaborate on the definition of emerging industries, the role of the regions and the adaption of smart specialization for regions and finally present an approach to come up with challenges and related emerging industries for the implementation of CluStrat.

Emerging industries

"Emerging industries should be broadly understood to include both new industrial sectors and existing sectors that are evolving and upgrading or merging into new industries".

This citation from the conclusions of the European Policy Cluster Group Task Force meeting on clusters to address emerging industries and services in March 2011 in Warsaw is a good starting definition also for CluStrat. Emerging Industries should not be confused with the term of emerging markets, which relates to the BRICs with high potential due to a new and growing consumer generation.

In general there are 2 ways to look at a definition of emerging industries (whereby **industries always include manufacturing and service industries**!):

1. Emerging industries are not yet here, so existing clusters or existing strength cannot be a pre-condition for their development. Rather, policy needs to create framework conditions for creativity and innovation. This is also the definition used by the Cluster Policy Group, which then requests the usual framework conditions like EU Patent, better funding for market access of innovative products, innovation as part of public procurement etc.

2. Emerging industries are those sectors, which are most likely to come in the near future or are even already seen to develop. Those emerging sectors or industries are a reaction to challenges of society. The trend in society is visible, but the industrial and service sector have not yet exploited it. Thus, it needs to emerge to exploit the market opportunities already visible. This means, there is a clear potential seen for new products and services, and policy looks for instruments to actively strengthen the existing potential to play a major part in those emerging industries.

For the 2nd definition, the existing clusters – traditional and those related to newer technologies – can be useful indeed**.**

The European Cluster Policy Group (EPCG) has tackled the issue of emerging industries in a paper and in workshops in a task force on using excellent clusters to address emerging industries and services (Tactics Reflection Group). A statement from here[1]:

"New industries and services emerge not only as a result of new technologies and entrepreneurial savvy, but also as a result of the renewal, transformation or intersection of existing economic activities. The evolution of economic activities occurs to take advantage of new opportunities (e.g. technological advances) and address new needs (related to e.g. climate change, energy and public welfare). Emerging industries can thus be grouped into three different types: 1) Existing knowledge applied in new ways to existing needs; 2) Existing knowledge applied to new needs; and 3) New knowledge applied to existing or new needs.

Clusters can offer a favorable ecosystem in which new industries flourish and grow stronger. They foster the interaction and collaboration between different creative milieusand innovation actors (including users/customers) in a region, and promote entrepreneurship by providing a fertile business environment for emerging high growth firms. In general, cluster programmes focus on ways to strengthen existing strengths and develop existing clusters. In the case of emerging industries, neither existing strengthsnor existing clusters can be assumed pre-conditions. That is why the role of clusters might be different for emerging versus established industries, and why different areas of focusand different cluster policy tools might be needed."

This statement is completely in line with the objectives of CluStrat and a close exchange and cooperation with this reflection group will be envisaged in the near future, e.g. in the spring meeting of 2012 in Vienna.

The EPCG reflection group´s objectives are to recommend policy action and discusses also possible support of the actual emergence of new industries and services.

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[1] Clusters and Emerging Industries/Services Page 4 of 41 Task Force Workshop #1 , TACTICS Reflection Group 12-13 May, 2011

CluStrat is positioned in a narrower angle: CluStrat anticipates that there is a need for industry to respond to the new challenges of society through new industries and services. Thus, the policy approach in CluStrat is targeting the support of existing clusters and cluster initiatives through new policy concept to enable their reaction and full exploitation of the new business and market opportunities. It is clear from the start, that a cross-fertilization of traditional sector clusters and enabling technology clusters is a key element and policy needs to identify new concepts to support this cross-fertilization.

CluStrat can thus be positioned to look into one aspect in detail within the scope of the Reflection group of the EPCG.

CluStrat should focus on emerging industries in the sense of already anticipated new and promising markets.

The aim is thus, to develop policies that enable existing clusters in established branches and technologies to exploit these markets. To achieve this, the new key enabling technologies and new emerging sectors have to be cross-linked with the established and traditional clusters.

Once clusters have learned to develop industrial sectors to exploit today´s emerging markets, they are also ready to take the next step and get ready for future innovation. CluStrat will therefore not neglect the above 1st definition, but concentrate on the 2nd.

What are those emerging industries then, which can be already anticipated today?

To answer this, we can have a look into today´s challenges and the necessary reactions from society, research and industry. Within the challenge of demographic change we can identify the emerging sector of active aging. Within the challenge regarding energy supply and climate change, we can identify the emerging industries of green economy or sustainable mobility. In the following pages, we elaborate more on those examples.

Proposal for a joint approach to select CluStrat emerging industry sectors

It is clear, that CluStrat will have to focus on few emerging industries to deliver a focused mapping and thus strategy in the available time frame.

What is the mapping process for (WP3):

Mapping will show the potential in each partner region in regard to the selected challenges and the related emerging industries. This cannot be done for all challenges and emerging industries, but a selection has to be made. This selection has to fulfill following criteria

- be concrete enough to understand the related market
- be flexible enough to enable each region to identify potential related clusters
- involve traditional sector clusters and key enabling technology clusters

The proposal is thus to use societal challenges and related anticipated emerging industries as basis for the selection process.

We propose 3 challenges and related emerging industries as basis, which fall under the criteria from above. To be consistent with EU policy, the challenges have been named according to the challenges of Horizon 2020, the European Communication to the European Parliament and the European Council on the future framework programme for research and innovation.

For each of the three challenges, one emerging industry sector is identified, that will cover several market sectors, involve several traditional sector clusters, needs several key enabling technologies and allows several service sectors to be developed. Thus: each and every region in CE should be able to place its own economy in this emerging industry sector!

Example: "Health, Demographic Change and wellbeing" Challenge and related emerging industries/services:

The demographic changes will lead to more elderly people, who want to stay healthy and active. This will create new market sectors, new demands in terms of healthier food, health care services and health care technologies. This market demand could be summarized in an emerging sector or emerging industry called healthy aging.

Healthy aging involves traditional clusters like tourism, medical technologies, agro-food etc. But it needs the expertise of new technologies from the creative industries, biotechnology, ICT – health care services etc.

Please find the three examples in the following pages. The listed clusters and technologies are not exhaustive but can be complemented.

Challenge: Health, Demographic change and wellbeing[2]

Related emerging industry: Active aging

(example, to be complemented)

Related sector	Related emerging Technology areas	Related key enabling technologies	Related traditional clusters	Related services
Health care	e-health	ICT Photonics Surface techn. Nanotechn. Microsystems Biotechnology Bionic	Medical technologies Manufacturing Materials Textiles	Tailored Health care services Counseling Design Marketing media
Nutrition	Bio-active foods	Biotechnology Advanced manufacturing	Agrofood Manufacturing Materials / packaging Medicine	Nutrition counseling Media / Marketing Design
Wellness	Creative industries	ICT Nanotechnology Microsystems Biotechnology	Tourism Manufacturing for sport/training Materials Medicine/Health	Health Coaching/ training Therapies Media/Marketing
	Digital Marketing/ social networks	ICT	Materials . Printing	
	Health diagnostics	Photonics, Industrial biotechnology Microelectronics Nanotechn. Advanced materials	Life Sciences	

Challenge: Climate action, resource efficiency and raw materials

Related emerging industry: sustainable development/green economy

Related sector	Related emerging Technology areas	Related key enabling technologies	Related traditional clusters	Related services
Energy efficiency	Sustainable construction	ICT Nanotechnology Microsystems	Materials construction manufacturing	Engineering Design Architecture
Energy storage				
Renewable energies	Photovoltaics / Solar Wind Water	Nano/Micro Embedded systems	Construction Materials	Engineering Design Architecture Energy counselling
	Chemical fuels	Biotechnology Microsystems Photonics Embedded systems	Chemical industry Agro-Tech	
Green production	Materialefficiency	Photonics Embedded system Microsystem ICT Robotics	Materials Manufacturing	Engineering
	Waste handling (solid and sewage)	Recycling Biotech Photonics Embedded system Microsystem ICT Robotics	Envrionmental Technologies Sanitary engineering (Water, Air …) Process engineering	Engineering

Challenge: Smart, green and integrated transport

Related emerging industry: sustainable mobility

Related sector	Related emerging Technology areas	Related key enabling technologies	Related traditional clusters	Related services
Alternative engines	F-Cell	ICT, Microsystems	Materials Construction Manufacturing	Design
	e-cars	ICT, Microsystems	Materials Construction Manufacturing	
Public transport	Intermodular transport systems			
Intelligent transport	Driver assistance systems			
	Traffic control systems			

Key enabling technologies

The European Commission selected in its 2009 Communication "Preparing for our future: Developing a common strategy for key enabling technologies in the EU" six KETs, on which the High Level Expert Group on KETs has focused:

- Nanotechnology
- Micro-nanoelectronics
- Advanced materials
- Photonics
- Industrial biotechnology
- Advanced manufacturing systems

"KETs are of systemic relevance. It is observed, that a combination of KETs is necessary at all levels of the value chain to the development and manufacturing of advanced innovative products."[3]

CluStrat will certainly include those KETs in the emerging industry sectors selected. Especially advanced manufacturing so far had been neglected as key enabling technology in our matrix and will be included, as it is a very important area which cross-cuts all industry sectors.

But we should not restrict ourselves to those, as for example ICT and creative industries certainly also are enabling technologies with high potential for many traditional industry sectors. In addition, CluStrat will also look at services and not just products. As well as products, innovative services will also need the application of key enabling technologies, like from the ICT or creative industry sector.

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[3] From the final report of the High level expert group on KETs, 2011

Smart Specialization

These examples show, that within different society challenges, we find a variety of sectors, which again involve different emerging technology areas, key enabling technologies and traditional sectors.

The key word for CluStrat here is Smart Specialisation!

Smart Specialisation means, that regions concentrate on those sectors, where they have the biggest potential to become technology or market leaders or at least be in the forefront of development. This means, they base their future development on existing strength or existing economic and innovation structures (enterprises, agencies, RTD). This existing structure is then combined with key enabling technologies, which will be needed to bring the region´s economy to the more competitive level to answer emerging market needs.

Example:

Everybody wants to use the potential of nanotechnology.

Region A has strong furniture industry

Region B has a still active textile industry

Region C has strong nanotechnology industries in a cluster

Smart spezialisation means, that Region A and B use their existing economic structures and combine them with the knowledge of Nanotechnology – for their specific industries. Region A may so develop a furniture industry specialized for laboratories or hospitals or kitchens, due to their knowledge on antimicrobial surfaces. Region B may so develop textiles for specific use in sports or working clothes for hospitals and kitchens, due to their knowledge on textile nano-surfaces. Both regions get their knowledge through cooperations with Region C – their nanoindustry benefits from getting clients for their technologies.

This means for CluStrat, that we shall support smart specialisation through transnational cluster collaborations, which will benefit all involved regions.

In CluStrat we have a huge potential of different emerging sectors, emerging technologies and traditional ones. The positive aspect around the idea to develop our

definition around emerging industries based on societal challenges is, that the different regions in CE can have different specializations within the same emerging industry.

In Healthy Aging, one region may specialize on e-health with other regions taking the supporting role. Another regions specializes in bioactive food etc.

Even within one emerging sector, as in green production as part of the green economy, different specializations like waste handling, material efficiency etc are possible.

The way forward –
Preparing our 1st transnational policy dialogue

Our preparation for our first transnational policy dialogue should complement the picture of the emerging industries according to the above used template. Together we have to define a selection of emerging industries, which we can use as a basis for our decision making process.

In Stuttgart in December 2011, we need to decide on which emerging industries our mapping process should focus on. This discussion paper forms the basis, which then can be fine-tuned in the 2 hour workshop on 15th December.

The 1st draft has been discussed in the partnership through linkedin and email exchange. The result of this is this 2nd draft working paper.

Time Schedule for the decision making process

November 2011	Draft discussion paper sent out to all partners for comments
Until December 4th 2011	Virtual discussion on the paper
12th December 2011	2nd draft discussion paper available - concluded version considering the discussion and comments and based on that, a suggestion for the selection of emerging industries to be covered by CluStrat to be made during the 1st TPD
15th December 2011	Fine tuning of the discussion paper through discussion and feedback of the experts and the partnership; final decision

With the results of the mapping, knowing our potentials and weaknesses in those emerging industry areas, we can then work on a joined strategy, which will develop best opportunities and be in line with the smart specialization concept. No competition, but synergies among the regions and the cluster support structures. This will create a strong economy in the CE area!

Results of the discussion in view of the 1st transnational policy dialogue

Definition of the term "emerging industries"

The CluStrat partnership and their related policy makers have expressed their agreement to the used definition from the 1st draft paper on emerging industries.

In the meantime, the author of this paper has checked the results of the Tactics Reflection Group workshop on clusters and emerging industries and – very much to our consent – found a lot of similarities in regard to the definition of emerging industries and the need for new cluster policy concepts. The draft paper has thus been updated with this background information.

One comment from policy side was to re-think the term "industries" and change it to "business", as new business models will be needed for the future. In regard to the fact, that the term emerging industries is also used in European circles like the Cluster Policy Group or the European Cluster Alliance, we rather like to keep this term to avoid confusion. Nevertheless, the issue of new business models is valid and was raised in regard to cross-cutting issues, where we will discuss this further.

Selection of Emerging Industries in relation to societal challenges

Most of the partners welcome the three areas selected, few partners stress the point that the sectors might be too broad in its meaning.

Sustainable transport was mentioned mostly as a key emerging industry sector of high interest.

The Slovakian Cluster for Automation and Robotics missed the area of knowledge based economy and technology transfer as emerging industry within the societal challenge of competitiveness and growth. Thank you to them, as they worked out a full table with related sectors, technology areas etc. The related sectors were factories of the future, new robotic systems and intelligent machines and automation. One of the experts from Saxony replied, that our key enabling technologies are not completely in line with

those identified by the High Level Group in their final report on key enabling technologies, which also include advanced manufacturing as key enabling technology. With this in mind, advanced manufacturing indeed is needed for all manufacturing sectors, and as such it will be included in all emerging industries as a cross-cutting technology area.

The 2nd draft now contains a separate section on key enabling technologies and proposes to use the 6 technologies used by the High Level Expert group on KETs, but not to restrict ourselves to those 6 very much product related technologies. ICT and creative industries are also key enabler, especially when it comes to services.

Conclusion of the discussion – proposal for the 1st transnational policy dialogue

1. There seems to be a strong consensus on the three emerging industries identified in the working paper to be those to be selected for CluStrat.

2. Any additional technologies, services, clusters etc, not yet mentioned in the tables will be certainly added during the mapping process. Nevertheless, all partners are free to add their important clusters/technologies into the table.

3. Manufacturing will be included as a key enabling technology and thus be part of all emerging industries.

4. The business model topic will be included in the cross-cutting issues

5. The 6 KETs identified by the EC will be included, but CluStrat will not be restricted to those 6 KETs.