

Synergy and Empowerment Concept

Based on good practices shared and implemented in
the Interreg BSR project Emplnno

Advanced Materials

November 2018

Synergy and Empowerment Concept – Advanced Materials

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EmplInno – S3-Empowering for Innovation and Growth in Medium-Sized Cities and Regions

To turn the Baltic Sea Region (BSR) into Europe's most dynamic, innovative and competitive economy of the continent, the regions need to apply and constantly improve their Research and Innovation Strategies for Smart Specialisation (RIS3). Since 2016 the Interreg BSR project EmplInno supported partner organisations from twelve regions in Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden to foster the implementation and improvement of RIS3. The project provided strategy owners, strategy implementers and other innovation actors with resources to better work with the RIS3 approach and boosted cooperation and knowledge exchange between stakeholders within and beyond the partner regions.

The partners developed and implemented numerous R&D transfer workshops, matchmaking and networking events as well as training formats. By doing so they provided companies, universities and other actors with knowledge and resources to implement innovative and competitive ideas. Furthermore, EmplInno helped to improve and update regional smart specialisation strategies by transferring experiences and recommendations to regional authorities as well as strategy implementers to adapt and use the RIS3 for the benefit and growth of the region.

Further information: www.empinno.eu

Table of Contents

1. Introduction to advanced materials perspectives	4
1.1. The aim of this document.....	4
1.2. Market and its specific challenges	5
1.3. The present situation of topical implementation of advanced materials in the partner countries, and their challenges	6
1.3.1. Region Östergötland	6
1.3.2. Region Gävleborg	7
1.3.3. Riga Planning Region	8
1.3.4. Kaunas Science and Technology Park	9
2. Practices and implementation tools	10
2.1. Building regional capacities by specialist team and sharing specialist	10
2.2. Building interregional and international partnerships	11
2.3. Building capacity and relations between local stakeholders	11
2.4. Building capacity for transition from research to industry for regions with national strategy	12
3. Capacity building	14
3.1. Sharing specialists and practises for capacity building	14
3.2. Regional and international partnerships – delegation trips	14
3.3. Building capacity through activities/workshops which also focus on sharing practice in R&D transfer	15
3.4. International partnerships seeking – International workshop	16
3.5. Regional focus – local stakeholders and building capacity - cluster	17
3.6. Mapping for academia-industry transition	18
3.6.1. Smart Specialization Participants mapping	18
3.6.2. Human resources identification	18
3.6.3. Recommended actions for policy makers	20
4. Activation formats for building capacity	21
4.1 Reaching stakeholders / building capacity - workshops	21
4.2 Growth of clusters	21
4.3 Sharing specialist and academia-SME exchange from R&D transfer workshop	22

1. Introduction to advanced materials perspectives

1.1. The aim of this document

European regions are encouraged by European Commission to develop “Research and Innovation Strategies for Smart Specialisation” (RIS3)¹ to identify as well as exploit markets and resources for regional development and growth based on their socio-economic conditions and challenges.

The Baltic Sea Region (BSR) consists of countries and regions with dynamic, innovative and competitive economies. They also have quite different economic circumstances and also different political leanings. By cohesive efforts the BSR countries can strengthen the development towards a sustainable, competitive and territorially integrated Baltic Sea region by connecting potentials over the borders to be a leading competitive part of Europe.

Advanced materials can be described as new materials or modified traditional materials which have substantially better, new or multifunction properties. These create new or additional values by market competitive technologies or products. Advanced materials field has a cross-over potential impact in a wide range of fields, while it is at the same time challenged by a long-term implementation scheme from novel materials approaches to system integration.

This document addresses

- firstly, innovation intermediaries interested in the model of sharing specialists for intraregional mobilization and interregional exchange, and examples from exchange of project results for tools and formats to develop resources which are in line with research and innovation strategies.
- secondly, authorities entering an activity as broad field (direct into topic advanced materials, or indirect like nanotechnology, sustainability, energy, etc)

EmplInno² – an EU-Interreg project aiming at fostering the implementation and improvement of RIS3 in medium sized cities and regions in the Baltic

Sea Region (BSR) – includes twelve partner regions to support innovation intermediaries (i.a. business support organisations, science parks and universities) with tools and formats to work with the RIS3 approach and to boost cooperation with SMEs within and beyond the partner regions. Six thematic priorities were chosen to produce project results for developing synergy and empowerment tools which could be adapted by innovation intermediaries to develop resources which are in line with research and innovation strategies to

- enhance R+D transfer to/between SMEs to build a knowledge-based sustainable economy,
- promote cross-sectoral knowledge exchange to identify future markets,
- offer matchmaking opportunities to/between SMEs to make use of existing capacities and strengthen regional competitiveness,
- offer capacity building for more knowledge-based economies,
- foster cooperation between regional/transnational stakeholders to enhance global competition,
- and thus capture opportunities and implement innovation projects in the BSR.

The present document focuses on the thematic group “Advanced Materials”. The field includes an extremely broad range of areas. Examples include anything from food (by modifying functional properties using physical and chemical changes) to digital communication or connected internet of things systems (new materials approaches for faster processors or use of higher/faster band frequencies), construction and logistics related (buildings, transport), etc. Even if topical implementation is executed to a higher degree in a region, there will be challenges within this field due to the wide range of applications. Stakeholder efforts easily become unfocussed, and there will therefore exist different levels of practical topical implementation.

A model for intraregional mobilization and focusing as well as providing a format for enhanced interregional partnership is presented. Synergies

¹ European Regions are implementing Smart Specialization (RIS3) that is an innovative approach/strategy to bring together local authorities, academia, business and society to boost growth and jobs in Europe. A RIS3 prioritizes domains, areas and economic activities where regions have a competitive advantage and this number of these priorities vary from region to region.

² “Empowering for innovation and growth in medium sized cities and regions” 2016-2019; www.empinno.eu

with cluster competencies and their networks may further boost the advancements, or generate new possibilities. The model includes a specialist team / working group which maps particular focus areas and initiates concrete exchange (for example pilot projects elaborated from workshops). Regional collaborations are enhanced by sharing specialists, and a region can speed up implementation by shared practices from other (more topically advanced) regions. The model has a long-term perspective since it may be applied to smart specialization 2.0 regarding transregional collaboration³, and use the built up momentum from shared practices between regions. The challenge is how to create such team (organization wise and people with complementary competence, as well as funding arrangement) and tools for sharing practices. This document provides some examples from four partner regions in the thematic area with various level of topical implementation.

1.2. Market and its specific challenges

Market potential

New or multifunctional properties of advanced materials create a variety of applications which lead to innovation and technological advancements. The multigenerational nature of advanced materials creates a potential for transforming the industrial sector and for achieving climate, environmental and resourceefficiency targets at a faster rate. Materials sectors are relevant in most fields for the transition to a smarter industry. These are also a foundation to boost so called 'key enabling technologies' (KETs) which have longer term impacts, as well as enabling preservation and long-lasting industrial transition at a global level. Key research and development (R&D) areas, innovation and priorities in advanced materials are important smart specialization channels to realize industrial transformation. The progress in these channels and realization to commercial value chains are governed by collaboration within and between regions.

Advanced materials are expected to generate more technological developments and knowledge intensive production. Novel innovative approaches push the industrial development by tailoring material properties

to specific functions which add value. Value Added Materials is a group of advanced materials that have strategic importance for economic growth, industrial competitiveness or address the Grand Challenges of our times⁴. The market for value added materials was 101.7 billion Euro in 2008 and has the potential to grow more than 10 times over next 40 years.

Time to market

The transition over the next 40 years includes to consider specific challenges related to:

- *Patent protection:* Only well protected material innovation assures the competitive advantage on the market in the long run.
- *Duration of product development and scalability:* Knowledge intensity makes value added materials hard to develop to pilot prototype and subsequently scale into industrial products and applications, which is one reason for a long time-to-market (typically claimed to be around 20 years).
- *Market maturity of products using material, and value:* The market must be mature and ready to use a given value adding material. The demand for a new material is largely dependent on its value related to cost and fabrication aspects. The implementation of use (or not) will therefore critically depend on the combination of factors like price, dimension of scalability, complexity of production etc.
- *Market (in)stability:* A main challenge is related to the capital market. There exist peculiarities of the capital market that is seeking short term profits by channelling the innovation focus to the service sectors instead of technologies since the time to market in service sectors is much shorter
- *Need of adaptation along with industry transition* The smart industry transition offers potential synergies which could be developed. Improved material properties have no value if the products do not match the modern industry. In parallel to continuous emergence of innovative materials concepts, there is a transition from traditional to modern industry. This makes it difficult to predict which routes are the best for the long-term impact.

³ <https://cor.europa.eu/en/news/Pages/Regions-and-cities-call-for-a-new-Smart-Specialisation-2-0-built-on-interregional-cooperation.aspx>

⁴ 'Technologies and market perspective for future Value Added Materials', European Commission - Directorate-General for Research and Innovation 2012, B. Romanow and M. Gustafsson, Oxford Research AS, ISBN 978-92-79-22003-6

Some considerations in this respect are that stakeholders (companies) should

- move from manufacturing to competence company
- compete based on competence instead of price
- think process and value creation instead of product • consider the need of innovators and early adapters

The long-term considerations of time to market and market maturity provide substantial strain on advanced materials transition. The smart industry transition is based on innovations. The actors and regional players which create or pick up / adapt innovation concepts are often in academic research or SMEs. Large industries do not have the same fast responding to innovation exploration capacity since they are focused on their traditional markets. However, actors and regional players can not aim at commercial stage which is several years from now. In order to survive, they must focus on daily research or business issues more than future potentials. This situation is common for all regions to larger or less degree, and was confirmed by mapping activities of the four thematic partners. This has the effect that activities must even more consider academia - SME – large industry exchange in relation to the modern smart industry change. This could for example be to promote credit for researchers being involved in industrial projects, creating clusters for meetings between academia, SME, and large industry, etc.

1.3. The present situation of topical implementation of advanced materials in the partner countries, and their challenges

This section describes the details of the topical implementation related to advanced materials for each of the four thematic partners, and their status of implementation. In comparison, Latvia and Lithuania are too small countries to have regional focus. The smart specialization is national. This means that partners Kaunas Science and Technology Park and Riga Planning Region can not be the authorities which can take the lead to push for topical implementation. In another description, actors leading an implementation are called strategy owners.

The smart specialization implementations for each partner have variations in time and strategy ownership between partners. Basically the partners can be placed in two categories: (i) regional strategy and strategy owner; (ii) national strategy and not strategy owner.

The slightly different materials focus (materials, production, engineering, sustainability, technologies) and difference in time creates a width of topical implementation which create additional needs to find joint areas for partnership. For such, shared specialist was a format for identifying common grounds (see e.g. sections 2.1, 3.1, 4.3).

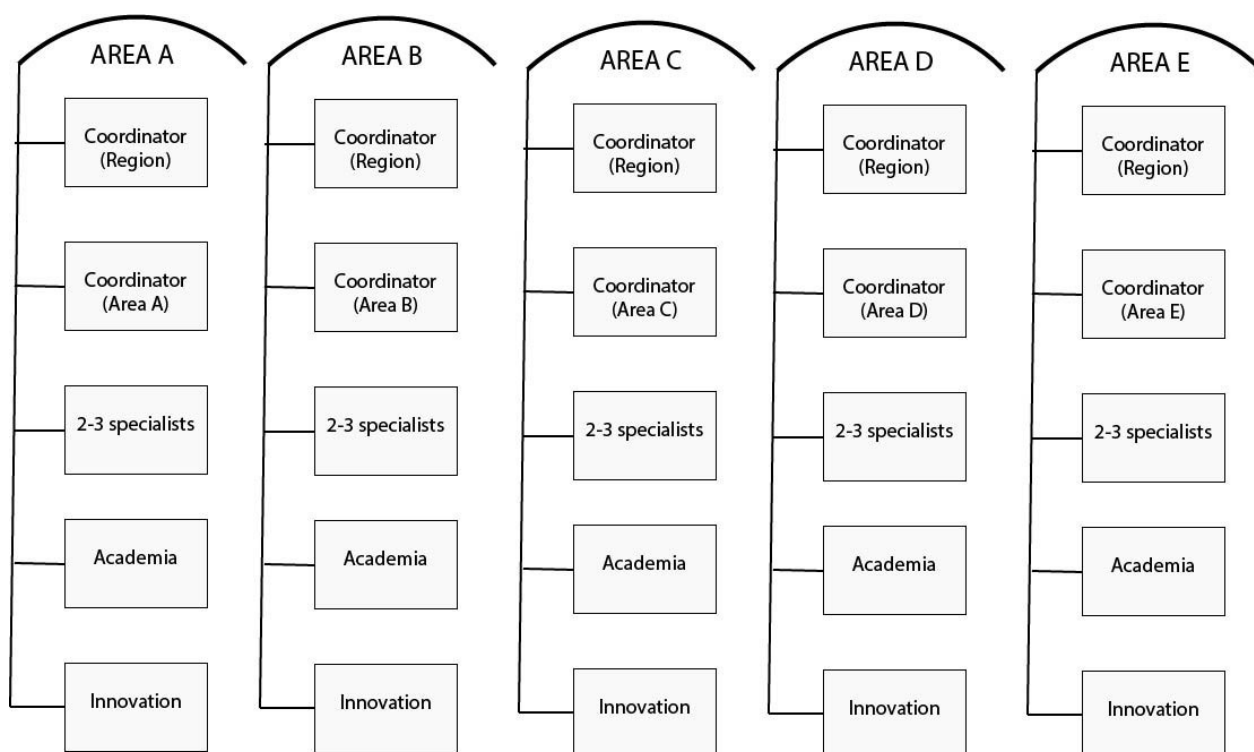
Region Östergötland had regional smart specialization strategy decided in 2013 and is strategy owner. The field of smart specialization is “**Advanced Materials**”

- Region Gävleborg had regional smart specialization strategy decided in 2017 and is strategy owner. The field of smart specialization is “**Material technology and sustainable production**”.
- At Kaunas Science and Technology Park there is no regional strategy since smart specialization is national. The smart specialization in Lithuania was decided in 2014. Kaunas Science and Technology Park is not strategy owner. The area related to materials is “**New production processes, materials and technologies**”.
- At Riga Planning Region there is no regional strategy since smart specialization is national. The smart specialization in Latvia was decided in 2014. Riga Planning Region is not strategy owner. The topic is “**Smart materials, technology and engineering**”.

1.3.1. Region Östergötland

Region Östergötland established a smart specialization structure in 2015-2016. There were five specialization areas identified. The region appointed one responsible person for each area from its organization. This responsibility is not to practically implement the smart specialization activities per se, but to make sure that the smart specialization and regional strategy is in line with activities. A working team was assigned to each area of strength. The team members had different skills to create a complementary scheme. One person was appointed as coordinator for each area. The coordinator was supported by specialists. This team proposed and implemented activities practically.

The research and innovation aspects are important channels. Therefore one contact person for each was appointed. The overview of innovation climate and actors (SMEs, researchers etc) is a key factor. In the region, LiU Innovation is an organization that has good overview and are up to date with recent innovation aspects as well as new companies etc. LiU Innovation is an affiliated organization to Linköping University, and has professional business coaches who have contact



with students, researchers, innovation actors, SMEs etc. Therefore, one person from LiU Innovation was set as contact point for each topical area. Secondly, for linking with strong research areas, one key researcher from Linköping University close to the area was set as contact point for each topical area. The structure with link between RIS3 specialists to academia and innovation system was useful for building capacity (section 2.3), with a case of academia-SME and academia-SME-industry from sharing specialist and R&D transfer workshop (section 4.3).

The market need

Thereby the described smart specialization structure was in place. However, the value chains and collaborations are scattered due to the width of the thematic priority Advanced Materials. The working team carried out a mapping by using their networks and organizing local workshops that identified materials avenues aerospace, nanotechnology, composites, additive manufacturing as advanced materials areas with higher strategic importance for the region. The needs for these areas are several, but as an example of the largest area, in aerospace there is a need of capacity building for industry. There is strong

research with various materials focus areas, and there are strong links to Clean Sky (which is a public-private partnership between the European Commission and the European aeronautics industry with environmental performance targets)⁵. There is a strong competence in both research and industry. However, the link is weak and R&D transfer is only in few established collaborations. The capacity need is both intraregional as well as international. There are strong competencies but relations between stakeholders need to be built up. Since there are strong links to Clean Sky, the international collaborations in R&D and industrial value chains were identified to address, for example building capacity by clusters (section 3.5). The cluster was possible to build by efficient activation channels by local workshops (section 4.1). The interregional and international exchange was conducted through delegation trips (section 3.2).

1.3.2. Region Gävleborg

Region Gävleborg has identified material technology and sustainable production as area of strength. This is based on a unique combination of major world-leading export companies in the steel, engineering and forestry industries, a dynamic base of small and medium-

⁵ https://europa.eu/european-union/about-eu/agencies/clean-sky2_en

sized service and technology providers in automation, process and measurement technology, maintenance and service. Several innovationpromoting cluster initiatives exist and a significant research is conducted in the region's companies. The overall skills they have in advanced materials and process engineering development and automation are internationally viable and crucial for Gävleborg's vitality and development.

The Swedish regions of Dalarna, Gävleborg and Örebro make the Central Sweden. This has the purpose and goal to contribute to achieving the members' regional development strategies from an EU perspective, mainly in political lobbying and project development. By partnership, the regions areas of strengths were combined in certain overall focus areas. The joint regional size of Central Sweden thereby expanded and could create matching to large regions in Europe to make more attractive partnership potential.

In 2016 there was a prestudy with Region Östergötland regarding smart materials. It acted to initiate screening of strong areas in Gävleborg. This resulted in identification of some materials focus areas, such as steel, metallic materials and additive manufacturing. In parallel, in 2017 the region finalized the full regional smart specialization strategy. The smart specialization topic was modified from smart materials to material technology and sustainable production.

Region Gävleborg decided end of 2017 to assign resources for a process leader for the thematic topic. The recruitment procedure was started and a process leader for the topic came in place in first half of 2018. The sharing practices are being implemented with Region Östergötland (section 2.1). The capacity building could be boosted by clusters. Sharing experiences for such is ongoing with Region Östergötland which recently formed a cluster network, and can receive input from Region Gävleborgs experience in a cluster growth project 2007-2013 (section 4.2).

The regional market need

During 2017 and 2018 there have been an initiative to form an innovation node. The areas of innovation are related to steel industry, engineering industry, wood, additive manufacturing (powder). Region Gävleborg is now moving from focus groups to smart arenas in which collaboration contributes with different components in terms of resources, perspectives, and functionality. It promotes, creates and produces research solutions and innovations. An action plan is being formed in the region. The areas of excellence will be used to identify activities to enhance collaboration and impact between R&D, industry and public sector on a large scale.

1.3.3. Riga Planning Region

The Smart Specialization Strategy of Latvia 2014-2020 identified five smart specialization priority areas. The ecosystems of these priority areas incorporate all industry, science and education representatives who create knowledge necessary for the successful implementation of the set strategic tasks for each smart specialization area. The strategy document is the umbrella document for the implementation of the national policy and provides guidance for the implementation of relevant operational programmes to facilitate achievement of the common goal – structural change of the national economy to increase the proportion of high added value products and services in export. The strategy is oriented towards promotion of knowledge intensive economics by investments in research, innovation and similar facilitating activities.

Smart materials, technologies and engineering ecosystem is a combination of specific processes of change, which results in creation of smart materials – such materials that are changing their qualities under the influence of external stimuli. Smart technologies and engineering systems are manageable processes, which can adaptively change when influenced by external physical, social, economic, psychologic and emotional factors.

The main emphasize in Latvia regarding smart specialization is on support for economy transformation, providing science and technology driven growth and progress towards a knowledge-based capacity development. Thus a new conceptual and complex strategy is created that includes and provides a balanced and complementary set of support instruments. At the same time it is necessary to promote development of not only technological innovation, but also non-technological innovation, as well as the development of entrepreneurial and creativity in all areas of the economy and social sphere.

In brief, the national strategy is presented as “General investments in the knowledge base” and “specific research activities in the five specialization areas”. Universities are defined as “knowledge hubs” that provide modern education and knowledge base for the economy.

Despite a low overall innovation capacity, Latvia has made considerable progress in individual industryrelated technologies: surface technologies and coatings, materials, engines, turbines, pumps and nanoscience. Clustering is one of the instruments for the consolidation and efficient use of resources. The most important sectoral clusters are forest and wood

processing cluster, agriculture and food cluster, as well as metalworking and mechanical engineering cluster. The area of smart materials, technologies and engineering systems is quite extensive and cover many areas of knowledge. Therefore, experts recognised 12 fundamental knowledge institutions and 33 applied knowledge institutions as significant in terms of R&D.⁶

The regional market need

In order to facilitate transformation of the national economy, it is necessary to promote structural changes in favour of the production of goods and services with a greater added value. For example, one of the exponents of added value is innovations. Their development and promotion of extensive application plays an important role. For consolidation of resources, there are nine national research centres, one of which is in nano-structured and multifunctional materials, structures and technology. It was identified that there is a need to build up the knowledge base. The origin are universities acting as knowledge hubs. The creators of knowledge are basic and applied research at universities.

Latvia has set up priorities, of which the following include materials:

- More efficient use of primary products for production of products with greater added value, creation of new materials and diversification of application
- Improvement of energy efficiency, which include the creation of new materials
- intelligent materials, technologies and engineering systems
- Advance knowledge base and human capital in intelligent materials, technologies and engineering systems as well as key technologies (nanotechnology, micro- and nano-electronics, photonics, advanced materials and manufacturing systems, biotechnology).

In order to realize these and build capacity from research to industry, it was identified the need to provide information to decision makers (section 2.4). This creates a need to do mapping of activities (example, section 3.6)

1.3.4. Kaunas Science and Technology Park

The implementation topic of “New Production Processes, Materials and Technologies” is divided in four priority areas: (1) Photonic and laser technologies; (2) Functional materials and coatings; (3) Structural and composite materials; (4) Flexible technology systems in production development and production. The period of the action plan for the priority areas is set to 2015–2020. The implementation of the national smart specialization was reviewed in Autumn 2018.

The regional market need

The thematic specificity “Explore and create surfaces with modifying material layers and nanodarminal technologies.” of the priority “Functional materials and coating” have the most demand in the current market. At the EmpInno project meeting in June 2018 when the national smart specialization strategy was presented, there was an update on smart specialization implementation. The implementation is slower than planned. The conclusion at the mid-term evaluation was that it was very research heavy, and evaluators came from research. One conclusion was that evaluators should be external (non Lithuanian). It is clear that a building capacity from research to industry is needed. A mapping activity described the status on national level (section 2.4). The sharing specialist is also useful for sharing practises locally (Kaunas) and identify common areas of strength between regions. It does not need to be a large event, a round table could move activities forward (section 3.3).

⁶ Analytical description of the ecosystem of smart specialization area “Smart materials, technologies and engineering systems”; Gundars Kulikovskis 2015.

2. Practices and implementation tools

The first stage aspect of this document to provide useful tools and formats to a large extent related to forming and building capacity. The potential to realize activities (transfer workshops, match making, events, delegation trips, etc) is very related to which degree the implementation has reached for each region. A working team is needed from practical point of view for the capacity building. A specialist and sharing concept are beneficial for interregional exchange which are in practice only useful if they result in real exchange (e.g pilot projects). Often activities are shared with other initiatives (research, institute, competence centers, etc). Few examples are purely from EmpInno project since regional strategies (with projects from European structural funds) and smart specialization are closely interconnected. Some concepts of insights from the EmpInno project partners in advanced materials topic regarding formats and tools are presented below.

2.1. Building regional capacities by specialist team and sharing specialist

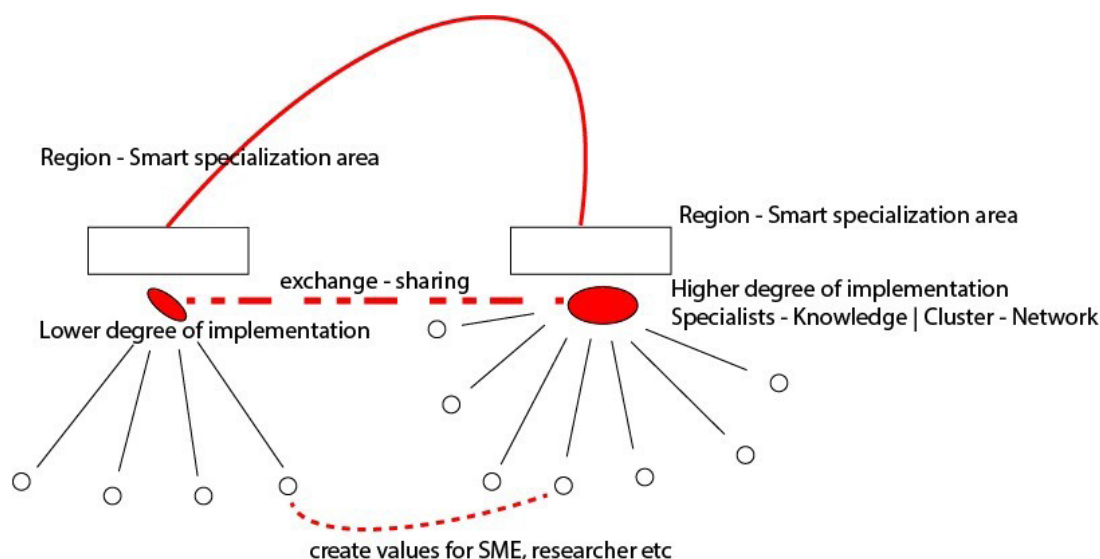
Description: Regional innovation systems often encompass specific strong areas or cluster specialisations. These contribute in scattered form to create and affect the regional strength. However, the innovation systems are not arranged in a cohesive way for the overall goal related to topical implementation in a certain region. Further, even though regions could provide matching areas to other regions to create complementary strength areas, each region has a different level of resources and implementation in time.

clear that each region has to build its capacity, but also that there has to be partnership with regions in order to have the long-term competitiveness which is a characteristic challenge of the advanced materials area as described in section 1.2. The building of regional capacity can be viewed to consist of two parts: (i) regional allocation of own resources; (ii) share resources in selective partnerships in an identified sub area between regions in order to progress in a joint manner.

Objective and results: Each region needs to allocate resources in order to implement the specialization area and address the broad range of the advanced materials field and long-term challenge of translation to a commercial technology. Each region has its own particular challenges. Common for all regions is that communication, interaction and dialogue are necessary to inspire and gather regional stakeholders around smart specialization. An example of such regional unification focus is local workshops, an example regarding activation formats is given in section 4.1. A key feature is to focus on activation channels which are related to the commitment and interest of local stakeholders.

An approach and specific model originating from the EmpInno project as a general recommendation for building regional capacities in identified partnerships, is that ***a partner who has advanced more in topical implementation may share experiences and practices which reduces the time of implementation for another partner*** who may not have resources to implement

It
is



a successful practice and thereby being at an earlier implementation stage. In such situation, a *sharing of specialists is one strategic investment for collective progress of topical implementation and strengthen innovation capacity*.

Success Factor: A success factor is that the identified regional partnerships are maintained or growing.

Transferability: This is transferable to other topical themes since it is not area specific.

2.2. Building interregional and international partnerships

Description: The necessity of regional and international partnerships for the long-term competitiveness creates a duality of challenge in relation to external regions and international partners. This is further complicated by the difference in topical implementation of each region. The duality arises because international collaboration is necessary, but becomes very challenging to realize if the intraregional areas of strength are less known.

The international networks with partners geographically close (regional) or distant (international) tend to align in different ways depending on maturity (emerging or developed economies)⁷. The study states that regional innovation systems in emerging economies (cf. less topical implementation stage) tend to engage more with global partners and have strategies with new or novel innovation character. The motivation is that it brings advantages from dynamic environments (cf. more advanced topical implementation character) in developed economies to their own emerging innovation system. The reason for this could be that regional networks are not established regarding innovation generation. Regional innovation systems in developed economies, and having more mature level of specialization in certain industries, has a higher degree of established regional or domestic networks. Thus, even if they differ, regions in emerging and developed economies could also find a complementary scheme of mutual benefit. It is necessary that each region knows its regional activities before an alliance with interregional or international partner can be implemented.

Objective: A similar situation as in emerging and developed economies in regional innovation strategies

could be present in emerging and more advanced topical (or smart specialization) implementation. The degree in case of RIS3 implementation is additionally challenged if smart specialization is regional or national. This indirectly relates to a necessity of transnational exchange (sharing information and practices) which act to clarify each region area of strength and finds complementary partnerships for an increased global and long-term competitiveness.

Success Factor: A success factor is that interregional or transnational partnerships result in real (e.g. pilot) projects.

Transferability: This is transferable to other smart specialization themes since it is not area specific.

2.3. Building capacity and relations between local stakeholders

Description: The fragmented area of advanced materials creates an urgency to inform and create a dialogue with stakeholders. A primary importance is to make beneficiaries to realize the general positive feature of topical implementation or smart specialization, but in particular that building capacity through innovations in a value chain will need long term implementation. Stakeholders must invest in building relations and joint capacity for the overall regional or topical goals in addition to their own focus.

Objective: The regional stakeholders must then support the smart specialization progress. The SMEs are the main source of new innovations which will have the long-term impact. Pilot projects will provide a real implementation of exchange and capacity building. The RIS3 structure presented by Region Östergötland was set to establish links between the region and its RIS3 specialists with representatives from the academia and innovation systems (section 1.3.1).

Exchange and transfer of information and innovations is necessary. A key feature is the personal interaction which builds trust to the next step. Therefore clusters, workshops, events, etc in a range from small meeting (for example breakfast innovation meeting) to large thematic events (e.g. fairs) is feeding the stakeholder exchange and build relations.

⁷ Plechero, M and Chaminade, C. (2016) 'The role of regional sectorial specialisation on the geography and innovation networks: a comparison between firms located in regions in developed and emerging economies'; Int. J. Technological Learning, Innovation and Development, Vol 8, No 2, pp. 148-171.

It is natural that the difference in topical or smart specialization realization creates challenges for collaborative growth between partners in an existing project, or a proposed transnational (regional) partnership in future project ideas. A partnership must have identified common areas of strength. Common areas are only possible to identify by first understanding the materials areas of strength at a region. ***Each region has therefore to map and overview its own situation.*** This will then reflect in which way areas in the different regions are complementary, or duplication could be avoided by communication channelling between regions. Once such understanding and overview is in place, transnational delegation trips and sharing experiences will be useful. The same is relevant for organizing international workshops. One difficulty for understanding the regions areas of strength is that resources must be allocated. This is closely related to the identification of a strategy owner in each region. A strategy owner takes the flag and pushes for creating a common view with regional stakeholders, and acts for all stakeholders understanding of smart specialization to SMEs, industries, universities etc. Smart specialization is not intuitively understood by local stakeholders, and must be presented in understandable terms. In simplified description: ***present how smart specialization will be useful for stakeholders in the short and in particular long term to increase their growth, value and competitiveness.***

Success Factor : A success factor is that stakeholders create a value chain in a pilot project.

Transferability: This is transferable to other smart specialization themes since it is not area specific.

2.4. Building capacity for transition from research to industry for regions with national strategy

The national level of smart specialization creates a challenge in implementing activities for a medium sized city. One factor for a medium sized city is to identify the areas to address. The below are two examples from partners Riga Planning Region and Kaunas Science and Technology Park. In both cases there is a strong national activity in research. In order to create a transition there are two possible practises given: (i) information to policy makers – example 1; (ii) create links between academia and industry – example 2.

Example 1 – Riga Planning Region

Description: The priority field of smart materials, technology and engineering systems is an important

component of the economic base of Riga Planning Region. The challenge is to have identified the fields of importance and active stakeholders.

Objective: The objective is to gather information which can be summarized to policy makers to create actions.

Success Factor : A mapp of strengths and identified needs which can be used for recommended solutions for policy makers to implement. On longer term this can be extremely important. For example by information to politicians who are not in power today. Information to them would give short barrier of future decisions.

Transferability: This is transferable to other activities which relate large and long-term initiatives since politic makers are always important for regional and national strategies.

Example 2 – Kaunas Science and Technology Park

Description: In Lithuania there is a challenge on transition from research which is carried out at applied science level and that is expected to lead to extended and intensified cooperation with Lithuanian high technology companies operating in the identified thematic specificity field of laser technologies and equipment for it, metrology, optical devices and technologies.

Objective: The research will contribute to the implementation of the policy of Smart specialization of Lithuania, bringing closer the research and business institutions. It is planned to develop a number of technologies and devices relevant to companies that develop innovative products: unique devices for protecting documents and other products (UAB “Holtida”, UAB “Grafija”, UAB “Lietuvos monetų kalykla”), optical elements and structures for light flow control, metrology and optical diagnostics (UAB „Eksma Optics“, UAB „Precizika metrology“, UAB “Integrated optics“, UAB “Šviesos konversija“, UAB „Altechna R&D“); microfluidic devices (UAB „Altechna“, UAB „Diagnolita“).

Scientists of Institute of Materials Science at Kaunas University of Technology (KTU) have already developed technology for optical security means including holographic and kinegram elements, which can provide a level of protection so that the document could not be counterfeited. The institute has technologies for making original graphical image, recombining, electroforming of master shim, roll-to-roll thermal imprint, application of adhesive and integration of images to document

and that ensures a competitive advantage over other manufacturers as the consumer would choose a safer product developed in Lithuania. The potential product market is very wide and includes both private and public institutions issuing securities and documents, excise marks, trademarks, etc. The list of possible customers includes the Ministries of the Republic of Lithuania, Lithuanian higher education institutions, Lithuanian state and commercial banks, Metrological verification laboratories, which already have a lot of cooperation experience. Holographic security labels can also be used for packages, permits, IDs and credit cards, clothing labels, licenses, event tickets, etc.

The Institute of Materials Science of KTU are also developing technologies (DLC technologies, laser and plasma technologies for the formation of micro and nanostructures), adapting them for the development of products with specific needs and commercial value. Currently, cooperation agreements with above mentioned companies, as well as successfully implemented joint projects in the past, ensures that new products find a way to the market and that KTU benefits from intellectual property rights. It is expected that the developed main products (wavelength dividers, optical sensors, unique security devices) will be patented by KTU, and their future use and commitment procedures will be established by additional agreements with consumer.

Examples (round table, breakfast for innovators) of initiation for building capacity through activities/workshops which also focus on R&D transfer from research to SMEs and problem-solving processes are given in section 3.3.

Success Factor: Demonstration that these developments ensure the University's leadership in Lithuania in the field of micro and nanotechnology and enables the development of competitive devices in a global scale.

Transferability: This is transferable to other smart specialization regions having national strategy and advanced materials topic.

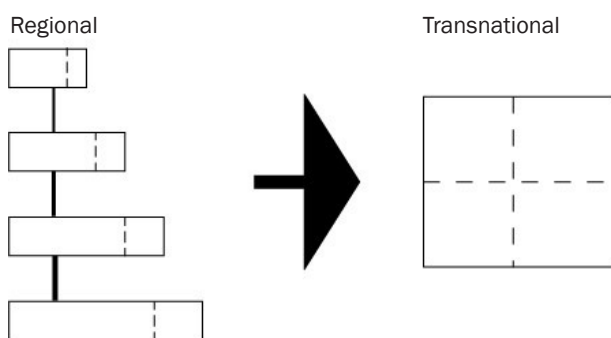
3. Capacity building

3.1. Sharing specialists and practises for capacity building

Full EmplInno activity

A positive feature about being strategy owner is that it is **possible to allocate specialists** from existing (or particularly allocated) resources (since strategy ownership naturally includes how to provide resources for strategy implementation). Region Östergötland appointed a specialist team of one coordinator and two experts in 2014. The sharing of practices between regions facilitates the overall implementation and necessary partnerships in advanced materials smart specialization.

Transferability: The collective synergy and empowerment of Baltic Sea Region could be facilitated by implementing such model. This could be useful for Smart Specialization 2.0 which discuss to have strong focus on regional exchange: “Future smart specialisation strategies should be based on interregional strategic cooperation, with the double objective of generating synergies between regional innovation and development policies, and financial instruments, and, secondly, of avoiding duplication”⁸. The cooperation of specialists and regions could evolve into a cohesive partnership in interregional and transnational context.



Regional collaboration leading to joint transnational focus

3.2. Regional and international partnerships – delegation trips

The four partners in the thematic priority Advanced Materials have identified certain areas which have common importance (directly or indirectly) and recognized areas of excellence and/or strength: aerospace, additive manufacturing, nanotechnology and advanced materials. The regional mapping is a necessary step for delegation trips. The examples are related to identified areas of strength with other regions external from EmplInno partners. The delegation trips identified common areas of interest and possible partners for both research and regional exchange.

Example 1 – Delegation trip to Emilia-Romagna, Italy.

Shared activity with East Central Sweden regional partnership.

The motivation for East Central Sweden regional partnership (Östergötland, Örebro, Västmanland, Södermanland) is that the regions will be stronger together. In comparison, each region is small compared with several European regions. The four focus areas of East Central Sweden are smart industry, tomorrow's energy solutions, sustainable food supply chain, and life science with focus on health and welfare technology. These are in a broader perspective, and can be viewed as umbrellas of the smart specialization focus areas where, for example, advanced materials can be viewed as a component under such umbrellas.

The purpose of visit was to build long term relationships and collaborations between different groups, to take home concrete insights, to develop opportunities for joint pilot projects and learn from each other's experience. Before the study visit, information was shared about the regional strategies and their areas of strength to discuss potential areas for collaboration and initiating common efforts.

Emilia-Romagna (E-R) was very early with smart specialization, even before the European activities

⁸ <https://cor.europa.eu/en/news/Pages/Regions-and-cities-call-for-a-new-Smart-Specialisation-2-0-built-on-interregional-cooperation.aspx>

related to RIS3 started. The E-R region identified three strategy areas:

- stimulating R&D activities in industry and especially in SMEs, supporting projects involving newly graduates and including collaboration with research centres,
- promoting industrial research and technology transfer from Universities and public research organisations to industry through a regional network of industrial research laboratories and innovation centres, organized into regional thematic platforms and located into a regional network of technopoles
- evolving industrial clusters towards knowledge dimension, through collaborative research and technology transfer, networking firms and promoting start ups.

The regional analysis consisted of (i) Identification of clusters with the highest employment potential and competitive impact to the regional economy; (ii) Matching selected clusters with the supply of industrial research platforms included in the Regional Network High Technology; (iii) Identification of mechanisms to steer the system towards innovation pathways aimed at strengthening competition, to product diversification and to tackle major societal challenges and scenarios for medium-long term, (iv) Develop specific strategies and the various measures to be implemented.

The key challenges are: (i) Upgrading the technology level and competitiveness of clusters playing a crucial role for the regional specialization model and (ii) Reinforcing emerging clusters with a high innovative potential and employment for the future.

The visit led to contacts and identification of common areas of interest between research groups at Linköping University (LiU) in Region Östergötland and University of Bologna (UniBo).

Example 2 – Delegation trip to Upper Austria.

Shared activity East Central Sweden regional partnership.

A two days study trip to Upper Austria had focus on industrial modernisation and future energy solutions including advanced materials and manufacturing. It also covered presentations about investor services, innovation support as well as clusters and networks. It included a visit to University of Applied Sciences Upper Austria Wels which accommodates two centres of excellence, i.e. Smart Production and

Energy. Wels prioritise automatisisation/simulation, measuring/testing technologies, materials/production engineering, energy/environment and food technology/biotechnology. At the end of the visit, discussions and working sessions were held to initiate a long-term vision and road map for the cooperation at cluster levels, the RIS3 level, between research groups, etc. Joint topics covering future energy solutions and industrial modernization were discussed with focus on challenges and joint actions/activities for further development of the topic. The Center for Smart Manufacturing is an industry-oriented teaching and research laboratory focusing on innovation and technology management. They do not perform much basic research, so there is a potential for future collaborations via EU Horizon MSCA-RISE and/or MSCA-COFUND calls. The Additive Manufacturing (AM) division has got two selective Concept lasers and is involved in projects with materials containing higher carbon. They demonstrated their Smart Factory Laboratory where development of new materials for AM processes is on-going.

3.3. Building capacity through activities/workshops which also focus on sharing practice in R&D transfer

Round table topic: sharing information on Nanotechnology and Infrastructure, visit Institute of Materials Science, National innovation and entrepreneurship centre.

EmpInno activity (Region Östergötland, Kaunas Science and Technology Park).

A round table in Kaunas was preceded by email exchange to resolve suitable persons to invite. Even though not formed as a large/broader event (workshop or network type of meeting), the minimized format created identification of areas of common interest. The participants were from National innovation and entrepreneurship centre at Kaunas University of Technology, Institute of Materials Science, Linköping University. There were sharing of practises from Maker Space (open technological innovations, start-up creation, prototyping), Fablab (tool to encourage young people to look closer at Technology and Engineering). The focus in the National Innovation and entrepreneurship centre⁹ were shared, such as knowledge exchange and technology transfer (sales), intellectual property management, young business incubator (KTU StartupSpace), promoting entrepreneurial mindset and activities, consulting services for research and business, promoting good practice. These could be applied in the Innovative



Lab visit Institute of Materials Science

Materials Arena for cluster growth which enhance R&D transfer to SME (section 4.1).

The laboratory visit at Institute of Materials Science¹⁰ had the outcome that it was found out that there is common interest between research at Linköping University (LiU) and Kaunas Institute of Technology (KIT) in nanotechnology and use of infrastructure for such. The Institute of Materials Science in Kaunas is one of Europe's infrastructures for Key Enabling Technologies (KETs). The institute also provide services for SMEs and industry¹¹ at Technology Readiness Level (TRL)¹² levels 3-7. In Östergötland region, Linköping University has nanotechnology research, and this is one of the recognized subareas within advanced materials smart specialization area at TRL level 1-3. Research activities are strong but also scattered. There is barely no link with industry or advanced device processing. Thus a common and complementary area was identified from the round table.

Breakfast for innovators

The small format for building capacity for transition from research to industry (section 2.4) was also applied through a Breakfast for innovators by Kaunas Science and technology Park. The sharing practice of this highlights the important features:

- Select one corporate which has one challenge/need to share.
- Collect 10-15 companies relevant on the specific challenge/need, all send in challenges which are distributed before
- Seminar with topical issues of the corporates
- Advantages: easy to implement (experience showed that simple format was more likely to get interest), both corporate and SME get feedback instantly on solution and proposals, mutual understanding easier when face to face, short event (experience showed that 3 hours was suitable, leaving time for informal discussion after formal activity)
- Needs: a motor to implement, a corporate to be willing to open up to expose problem/topic (not always that industry want to)

3.4. International partnerships seeking – International workshop



⁹ <https://business.ktu.edu>

¹⁰ <https://materials.ktu.edu/>

¹¹ <https://ec.europa.eu/growth/tools-databases/kets-tools/infrastructure/institute-materials-science>

¹² TRL is a metric for describing the maturity of a technology, from observation of basic principles (TRL 1) to system proven in operation (TRL 9).

https://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-g-trl_en.pdf

Impact is increasingly growing in research community. An international EmpInno symposium was carried out within the congress European Advanced Materials Congress 2017 which is a fundamental materials research conference. It had more than 500 participants from more than 90 countries in several parallel sessions with different topics. It was planned together with all four partners with Region Östergötland as main organizer. In average the symposium had about 10-15 participants (people moving in and out due to parallel sessions). The symposium was planned with own flyer and send out to several Baltic Sea projects, as well as through networks before the abstract submission deadline.

The learning is that there is still a gap between research and regional (industrial) focus. Even though impact from research is discussed by various funding organizations, including European Commission, there is in practise no benefit in scientific merits. Many researchers are therefore still focussed on the scientific outcomes (publishing scientific papers etc). The recommendation is to organize an industrially oriented event with invited researchers who will particularly travel to that event for academia-industry purpose. Then motivated researchers will have encouragement while more fundamental researchers involvement in applied research is a longer way to go.

3.5. Regional focus – local stakeholders and building capacity - cluster

Example 1 (cluster and regional partnership)

Innovative Materials Arena (IMA) was formed after two workshops as activation channels (see section 4.1). The arena gathers regional stakeholders in the area of advanced materials. The area gained financial support through structural funds (project period Jan 2018-Dec 2020).

During the formation, IMA has participated in a regional partnership, East Central Sweden (Östergötland, Örebro, Västmanland, Södermanland). East Central Sweden works to identify opportunities for collaboration in certain areas through the identification of key European regions. This type of partnerships could lead to future activities related to Smart Specialization 2.0 (transnational collaboration). Each region is small, but the joint effort to East Central Sweden is more comparable to European regions which are substantially larger than most Baltic regions. By that, a cluster (IMA in this case) could expand their networks.

Trips to three key regions within the fields of tomorrow's energy solutions and smart industry were carried out during the Autumn 2017 and Spring 2018. The regions were Emilia-Romagna, Upper Austria, and Baden Württemberg. In the two first representatives from IMA participated. In both cases opportunities in the fields of materials research and collaboration with the companies in the clusters around these regions were identified. The continued work is focused on identifying ways to get that into meaningful action, such as concrete project proposals within EU (Horizon, Marie Curie or Cosme), cluster collaboration (as proposed by IMA, Automation region and Alfred Nobel Science Park in association with other partners in East Central Sweden) or participation within the Vanguard initiative or the Smart socialization pilots mainly within the Industrial modernization or the Energy platforms. In November 2018 Region Gävleborg became member of Vanguard, and the established relation between Region Östergötland and Gävleborg is positive for future possibilities. The regions are also sharing learnings on cluster building (section 4.2).

Example 2

In Latvia, there is a need to increase knowledge base which now is mostly at universities. This can be done by centres of excellence.

The CAMART² is an H2020 Teaming project that will upgrade the existing Centre of Excellence in Advanced Material Research and Technology at the Institute of Solid State Physics University of Latvia (ISSP) to a new and significantly stronger Centre of Excellence. It has Swedish innovationintensive Consortium partners – KTH Royal Institute of Technology and Acreo Swedish ICT as experts in innovation and technology transfer. The upgrade will enable the efficient transfer of new materials and technologies into products for commercial and public benefits based on exchange of knowledge and synergy with innovation-intensive partners. The project facilitates creation of a more extensive ecosystem of innovation and technology transfer in the realm of advanced material research and application of these materials in innovative products. In addition, it will launch of new high technology production and service companies with high added value.

The R&D&I activities at the Centre of Excellence are focused on:

- Thin films and coating technologies;
- Functional materials for electronics and photonics;

- Nanotechnology, nanocomposites and ceramics;
- Computational material science by atomistic scale modelling of technologically important materials and devices.

The CAMART² implementation strategy is aligned to a new paradigm “Science with and for Society”. It is implemented by involving citizens, investors and corporations, and explores and supports science by engaging new perspectives and talents in research and innovation. Strategic objectives for this project are to:

- Increase the level of research commercialization;
- Enhance collaboration between entrepreneurs and academics;
- Develop a collaboration platform for enterprises and scientists, supporting joint research and faster technology transfer.

3.6. Mapping for academia-industry transition

Shared EmplInno activity

As an example of the usefulness of mapping for capacity building, Riga Planning Region has identified the need of mapping participants and human resources. This serves as an example of mapping activity to build information to policy makers. To consider is that mapping can include formal as well as informal clusters. It can also reflect areas of strength.

3.6.1. Smart Specialization Participants mapping

Innovation centres – human capital clusters

Universities that provide study programs in natural sciences are the most important innovation centres of smart materials, technologies and engineering systems in Riga planning Region. One of the most complete innovation clusters is located at the Riga Technical University Science Site where several relevant departments and institutes are located. Other innovation centres include the state research institutes of the University of Latvia and its subsidiaries that are spread over the territory of Riga Planning Region. In addition, the Medical Education Technology Centre of Riga Stradins University leads the sector in the fields of innovative medicine technologies, nano probes and adaptive optics.

Infrastructure provision – the basis for net present value

A considerable part of the research infrastructure is available at higher education institutions, especially scientific infrastructure that was developed during the implementation of the EU programming period 2007-2013. Private research and development infrastructure networks are owned by existing electronical and mechanical equipment manufacturing companies. One of the most relevant industrial clusters that is run by private companies is located adjacent to the centre of Riga due to its advantageous location close to transportation routes and the reconstructed manufacturing infrastructure. Given the fact that companies compliant with the smart materials, technologies and engineering systems area are also producers of high added value products for other smart specialization priority branches, there is a great potential for multiplication and export.

Industry participants – driving forces for excellence

Participants of this area are located throughout the Riga Planning Region but the density is much higher in the territory of Riga than elsewhere in the region.

3.6.2. Human resources identification

Scientists at higher education institutions

In the field of smart materials, technology and engineering systems, the largest scientific input comes from the two largest universities in Latvia – the University of Latvia (Institute of Solid State Physics) and Riga Technical University. The Technical University has also established a research platform “Materials, Processes and Technologies” that provides opportunities for applied research, for instance, the synthesis of nano particles, structural strength tests and durability predictions. A number of inventions have received patent rights and resulted in scientific publications. The total number of the scientific staff has remained stable over recent years – around 2,000 persons.

Entrepreneurs – private companies and state established companies

In 2017, approximately 20,600 persons worked for companies who work within the field of smart materials, technologies and engineering technologies (also includes industries that can possibly overlap with other smart specialization areas) in Riga Planning

Main participants of smart materials, technology and engineering systems in the Riga Planning Region

Smart materials, technology and engineering systems niches	Innovation centres - human capital clusters	Infrastructure – net present value	Industry participants – driving forces for excellence
Niche 1: Implant materials	Riga Technical University Riga Stradins University	Underdeveloped	Underdeveloped
Niche 2: Composite materials (i.e. civil engineering materials and building constructions)	Riga Technical University Riga Technical University, Institute of Silicate Materials University of Latvia Institute for mechanics of materials	<i>Latvijas Finieris</i> (Riga), <i>Rotons Ltd</i> (Ādaži municipality) <i>AM Energy Ltd</i> (Ķekava municipality), <i>Izoterms Ltd</i> (Stopiņi municipality), <i>Knauf Ltd</i> (Stopiņi municipality), other material producers	
Niche 3: Thin layers and coatings (i.e. building solutions)	University of Latvia, Institute of Solid State Physics University of Latvia, Institute for mechanics of materials	<i>Groglass Ltd</i> (Riga), <i>chemical factory “Biolars”</i> (Olaine municipality)	
Niche 4: Appliances (incl. electrotechnics and electronics, information engineering)	Riga Technical University Transport and Telecommunication Institute Riga State Technical College	<i>HansaMatrix</i> (Riga), <i>Baltic Scientific Instruments Ltd</i> , <i>Volfburg Ltd</i> (Salaspils municipality), <i>Saf Tehnika</i> (Riga), <i>Sidrabe</i> (Riga), members of the Association of Mechanical Engineering and Metalworking Industries of Latvia	
Niche 5: Mechanisms and working cars	Riga Technical University Riga State Technical College	<i>Rīgas elektromašīnbūves rūpnīca</i> (Riga)., <i>Automatizācija Ltd</i> (Riga), <i>CNC SAAN Ltd</i> (Mārupe municipality), <i>Fonons Ltd</i> (Riga), members of the Association of Mechanical Engineering and Metalworking Industries of Latvia	
Niche 6: Fiberglass products	Riga Technical University	Underdeveloped	Underdeveloped
Niche 7: High level chemical solutions	Riga Technical University University of Latvia, Institute for mechanics of materials, Wood Chemistry Institute	<i>Grindeks</i> , <i>Olainfarm</i> , <i>Olaine chemical factory “Biolars”</i> (all Olaine municipality).	

Region. The largest companies that employ more than 250 persons are mainly located in Riga proper and represent such industries as woodworking, manufacturing of electrical equipment and ship equipment manufacturing.

University and college students

In order to create and develop a new workforce in the area of smart materials, technologies and engineering systems, it is crucial to develop quality education from school to higher education diploma. During the EU programming period 2014-2020, this is being done by intensive involvement of schools in *Science, Technology, Engineering and Mathematics (STEM)* - related study programmes and activities. Education in smart materials, technologies and engineering systems is available at Riga Technical University, University of Latvia and the Transport and Telecommunication Institute.

Main industry indicators

The number of companies who are active in the field of smart materials, technology and engineering systems has been fluctuating around 380 in recent years. Their total net turnover exceeds 2,500 million euros.

3.6.3. Recommended actions for policy makers

During the implementation of the EmpInno activities in Riga Planning Region, the project team has contributed to summarize and document the results of analytic reviews in relation to the regional innovation ecosystems as well as held a range of meetings and workshops in order to gain better understanding of the system, ascertain relevant expert opinions and elaborate recommendations for the possible improvement in all smart specialization areas. The most important conclusions of discussions related to the field of materials are:

- Very narrow specialization in the field of materials should not be favoured in a region with a relatively small amount of human resource. Instead, it is important to encourage mutual synergies between projects and certain types of specializations, for example, projects that focus on smart materials, smart power engineering or smart energy should be concatenated.
- The academic and especially the research institutions are instrumental for the ecosystem of smart materials, technology and engineering systems. These institutions should be able to compete both

on the national and international levels. In order to achieve these goals, new competences should be attracted from a variety of sources, including other countries, and cooperation networks created.

- There are indications that some higher education institutions provide their students with general knowledge rather than focus on practically applicable knowledge. The quality of human resource should also be improved by putting more emphasis on scientific activity and less on traditional types of lectures.
- The system of business incubators and establishment of cooperation networks between new entrepreneurs should be strengthened in an attempt to ensure smooth transition from education process to production.
- Not all scientific institutions are willing to or lack incentives to cooperate with private companies. It is necessary to improve ways how to activate cooperation between scientists and entrepreneurs for the application and implementation of *Horizon 2020* projects.
- One of the serious threats for the ecosystem of smart materials is the continuously aging scientific staff. Current demographic trends pose a potential risk in the future.
- There is still a relatively small number of private companies that work with smart materials and are able to invest adequate amounts in innovation. The potential solution to this problem can be found in an increasing level of internationalization.
- Also, the system of vocational education needs restructuring with the purpose to focus on higher value-added products.

4. Activation formats for building capacity

4.1 Reaching stakeholders / building capacity - workshops

Shared EmplInno activity

Region Östergötland implemented earlier than other thematic partners a team of specialists to the smart specialization area Advanced Materials. During the regional supportive RIS3 work, it was realized that a cluster was a strategic way to increase awareness with local stakeholders and create synergies in the triple helix form (academic-industry-government relation). Once the vision was set, it was raised to different awareness levels by workshops. As a consequence of two workshops which gathered joint vision with regional stakeholders, a cluster was supported. The

Innovative Materials Arena (IMA) is formed during three years 2018-2020.

Workshop 1 – initiate awareness

Workshop 1 introduced the regional smart specialization and advanced materials as area of strength. The idea of Innovative Materials Arena (IMA) was presented. The participants responded positively. As a consequence, Region Östergötland applied for funding and it was accepted (Dec 2018).

Workshop 2 – identify strategic points for IMA activity and management

Workshop 2 gathered interested stakeholders to set content of IMA. A workshop with various strategic questions were held. The result is used to form IMA with a physical meeting node.



Workshop 1

4.2 Growth of clusters

Shared EmplInno activity

In the long term the system needs to be feed with visionary emerging concepts. The regional strategies are often longer term and rigid. Therefore clusters, arenas, competence centres are dynamic environments which can feed innovations to the system, as well as let innovations grow. In this aspect, the potential of linking the regional efforts with cluster investments

is a potential route. Regional focus may be in certain material and geographical areas, and complementary scheme between regions can be initiated. However, even partnerships between regions will not cover the full market need, in particular when the market is dynamic so no one can predict how to implement to commercial scale. Other channels are needed in addition to create a larger range of opportunities, and adapt to changes of the field and market. In this respect, clusters, arenas, competence centers are potential implementation channels.

Region Gävleborg with partner regions Dalarna and Värmland made an investment in developing the regional innovative environments. Clusters development is supported by collaboration with research and education. The SLIM project (2007-2013) included 15 cluster organizations with 700 companies and 60000 employees. In 2011 the SLIM project was rewarded with Region Stars by EC for best development projects in EU for the overall view and ability to develop existing regional strengths. The learnings are now shared to Region Östergötland for developing Innovative Materials Arena.

4.3 Sharing specialist and academia-SME exchange from R&D transfer workshop

Shared EmplInno activity

An example of exchange concept is taken from Region Östergötland and Region Gävleborg. It also illustrates the necessity of having long term endurance for creating exchange.

The two regions were active in a prestudy 2015-2016 regarding smart materials in the RIS3 context. In both regions, the stakeholders had not previously been mapped. An initial mapping was initiated with descriptions of categories (academic, institute, SME, and industrial stakeholders) and main field of area. In this mapping activity, there was a workshop in each region. One of the specialists from Region Östergötland joined the workshop in Region Gävleborg. One year later, an SME from Region Gävleborg (present at Gävleborg workshop) contacted the specialist in Region Östergötland declaring their interest to link to the research to initiate studies which could clarify materials concepts useful for the SME business. As a consequence, there were several project funding applications submitted. Two years after the original workshop, there were three projects based on that SME – university partnership. The topics related very well with two areas of each region: metallic materials and aerospace.

Synergy and Empowerment Concept

Based on good practices shared and implemented in
the Interreg BSR project EmplInno

Advanced Materials