



# TRANSNATIONAL LEARNING SEMINARS

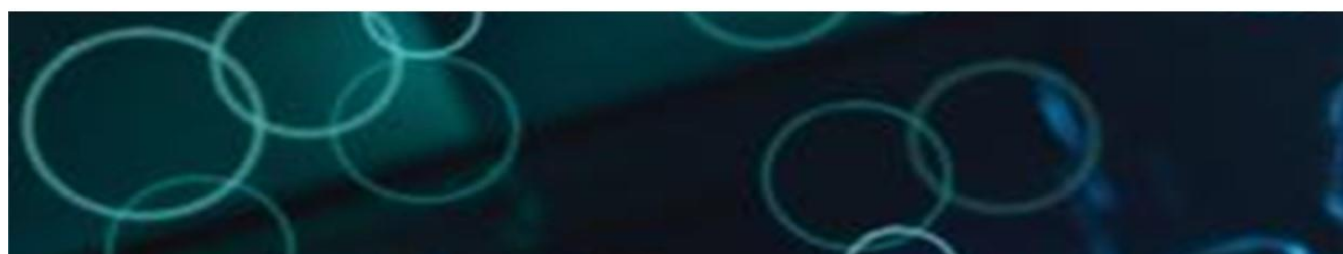
LARS WP4 Report



EUROPEAN  
REGIONAL  
DEVELOPMENT  
FUND



Vaasan yliopisto  
UNIVERSITY OF VAASA



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# 1. Introduction

## 1.1. The project and its aims

The LARS project attempts to help the public sector operating within various institutional frameworks to support innovation processes in their regions, and to connect innovation networks across and beyond the borders of regions. LARS is looking for improvements in public sector policies, supporting innovation.

LARS project partners have selected important or emerging value chains for their innovation strategies, analysed the selected value chains and their relevant stakeholders, conducted surveys on connectivity and functioning of the innovation networks, and organized focus group meetings to verify and discuss findings through structured dialogues.

This report describes, analyses and compares the findings of surveys based on the interviews made by LARS partners. The comparative analysis is based on the numerical data delivered in the partner reports. Data contains 141 interviews with carefully selected companies, public organisations, universities and NGOs. This is supplemented with qualitative analysis from interviews, partner reports and focus group meetings, where the quantitative data were verified by the informants, explanations of findings were discussed, and seen in context with outcomes of stakeholder and value chain analysis.

The bridge from these interviews to a strategy of policy innovation comes through expectations, experience and importance of relations. We use measurements of importance to identify the structure of networks, and measurements of expectation and experience to identify how our informants relate to them and try to improve them. Gaps may be differences between expectations and experiences in specific relations inside a region. Gaps are points of tension and frustrations, where actors may be willing and able to act, initiate pilots, closing the gap. Informants in the same region may, for several good reasons, experience their position within their networks, their gaps and their region in very different ways. After all, they have different positions. Different regions have different structures. Their strengths may also be explained in different ways, with different indicators.

The aim of this report (written by Jelena Barbir and Ivonne Stresius) is to find selection criteria for good practices in regional innovation policies, which can be used as one input by LARS partners when they are selecting good practices. Based on good practices, and matching them, LARS can initiate pilots.

Sometimes, innovation is done inside firms with no or limited external assistance. However, well-functioning innovation processes relies on wide reaching networks of innovation. This is why connectivity between companies, universities, public organisations and NGOs is a precondition for well-functioning systems of innovation. We refer to the fields where networks between and within different societal institutional areas develop as quadruple helices.

The triple-helix (TH) model (Leydesdorff and Etzkowitz, 1998; Etzkowitz and Leydesdorff, 2000, Virkkala et al, 2017) is used to describe both dynamic interaction between universities, companies and public organisations and institutional continuity which functions in different ways. Helices follow different codes of conduct. Universities, as scientific systems, communicate and function in accordance with the code of true/false, companies in accordance with the code of profit/loss, and the public sector in accordance with the code of right/wrong. By adding the fourth helix, civil society, we refer to various types of NGOs. They may be regional, national and international. The triple-helix models with the fourth helix is called Quadruple helix (QH) model (Carayannis et al. 2012).

In order to measure the networks, we used three core concepts: importance, expectation and experience. Usually, if an external actor or institution in your helix or a different helix is seen as important, and if you have high expectation, as well as good experience from your relation, the connectivity is good, and it is likely that the partner is contributing to your innovation. Some regions are characterized by high levels of connectivity, both inside the region and into wider areas. If experience and expectation are close to each other, the relation is good and functioning on a high level. Other relations are characterized by various forms of gaps between expectations and experiences. As shown in this report, there can be several types of gaps.

The concept “region” has different meaning in different parts of the Baltic Sea. In Norway, Sweden and Finland, regions are institutionalized political-administrative entities covering large geographical areas, within the context of national states, which are similar to a German Land. There is an on-going debate on reforms regarding the division of responsibilities and power between these levels. Our German partner, Hamburg, is a city region with a high level of autonomy, within the context of a large federal state, the German Federal Republic. The institutional arrangements defining these German relations are stable. Baltic countries are autonomous states, with a rather weakly developed regional level. In this instance, national data is sometimes treated as regional data, in order to make comparisons. In this report, we are referring to these different units as “regions”, and we use comparisons between them in order to discover good practices and problems, driving policy innovations.

In moving from individual level data with a lot of variation to a more generalized understanding of the deeper patterns of frustrations, tensions and gaps in regions and networks, we use well known

statistical methods reducing variation, like means and factor analysis. In this way, we can discover differences between regions.

According to LARS approach good practices on regional innovation policies/innovation systems are defined by the features of specific value chains, the features of relevant stakeholders in terms of urgency, legitimacy and power, as well as connectivity between the relevant stakeholders (regional, national and international), gaps between expectations and experiences. The challenges of connectivity in innovation systems and innovation policies depends on the same dimensions/factors, and our aim is to explore this phenomenon.

In the next chapter, we present the process of gathering, analysing and verifying the data by partners, after that in the chapter 3 the summary of partner reports and quadruple helix connectivity. We analyse the data gathered by partners in chapters 4-7 especially from the perspective of good practices in connectivity of innovation policy. In chapter 4, we present and compare the stakeholder analyses made by partners. The rich interview data with very many dimensions of quadruple helix relationships will be analysed statistically in chapters 5-7. In different chapters, we will focus on different parts of the data, and the data from different analytical levels and perspectives. We use mostly factor analysis, which helps us to summarize the dimensions and find possible underlying patterns of quadruple helix (QH) relationships. In the chapter 5, the focus is in partner importance across helices and LARS regions based on the means of absolute values given by the respondents. In chapter 6, we use factor analysis to summarize the partner importance variables, and we examine the link between partner importance and expectations of the QH relationship with the help of factors analyses and correlation matrices. Expectations are seen as a driving force in an innovation system. The chapter also examines the dynamism in QH network, and introduces indicators measuring the strength of the relationships, the quality of relations and the tensions in relations of QH network. Chapter 7 introduces the good practice descriptions and the descriptions of development challenges made by partners. Chapter 8 summarizes the comparative analysis per helices and per LARS regions and makes suggestion for selection criteria for good practices based on the statistical analysis on indicators on characteristics and tensions of the QH networks. It also responses to the question what is the potential for innovation in the LARS regions.

## **1.2. Description of the partner regions**

Before comparative analysis based on LARS data, it is useful to describe the case study regions with the help of official statistics, in order to understand where they stand regarding some key characteristics. Teemu Saarinen has kindly provided this analysis section 1.2. for this study.

One way to look at the regions is their size (Figure 1.1). In terms of population, the countries of Latvia (1,9 million) and Lithuania (2,8 million) are the largest, followed by the city-state Hamburg (1,8 million). The rest of the LARS partner regions are much smaller in population (0,2-0,3 million), and of same size.

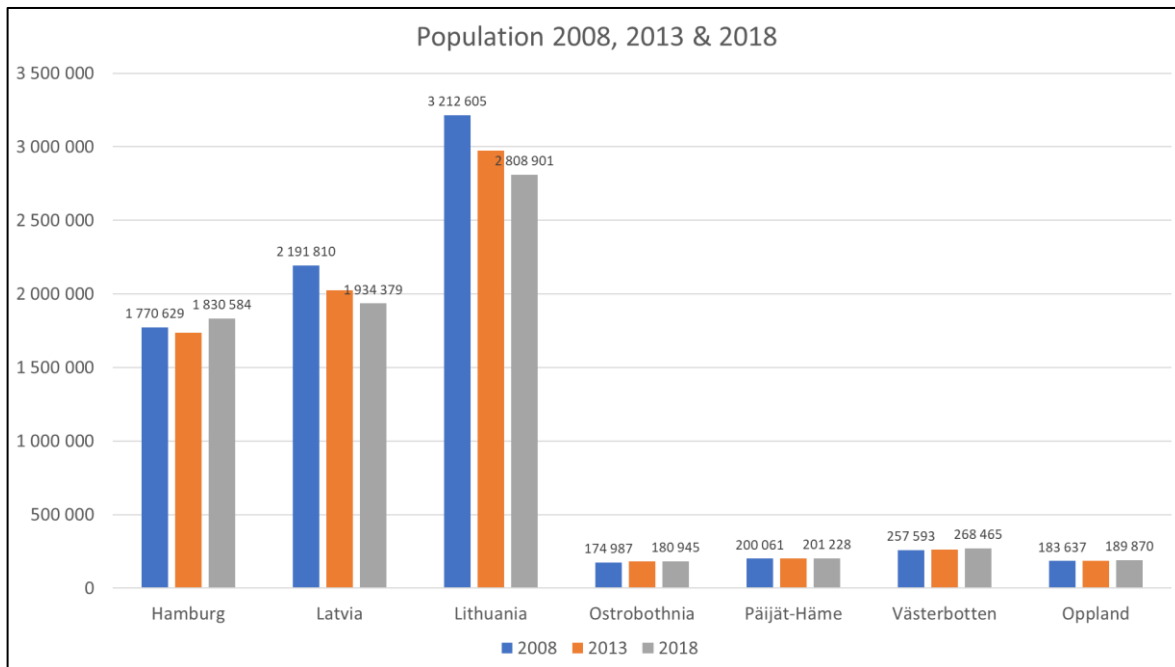


Figure 1.1. Population in the areas in 2008, 2013 and 2018 (Eurostat 2019a).

Perhaps the most striking development has been the shrinking of population in the two Baltic countries, Latvia has lost 12 percent and Lithuania 13 percent of their population size in just ten years. Hamburg has grown 3 percent in the same time, although there was a small drop in population numbers in 2013 compared to 2008. Ostrobothnia has also grown 3 percent, Päijät-Häme has grown less than one percent, Västerbotten has grown 4 percent and Oppland has grown 3 percent. In conclusion, the developments have been minor, with the exception of the Baltic countries.

One way to look at the case study regions is also via accessibility (see Figure 1.2), which has been previously analysed in ESPON-programmes. This data is available through S3 Platform (2019). As has been stated (ESPON 2013b: 50): "...Population in all destination regions is weighted by the travel time to go there. The weighted population is summed up to the indicator value for the accessibility potential of the origin region. All indicator values are expressed as index." The calculations are explained below.

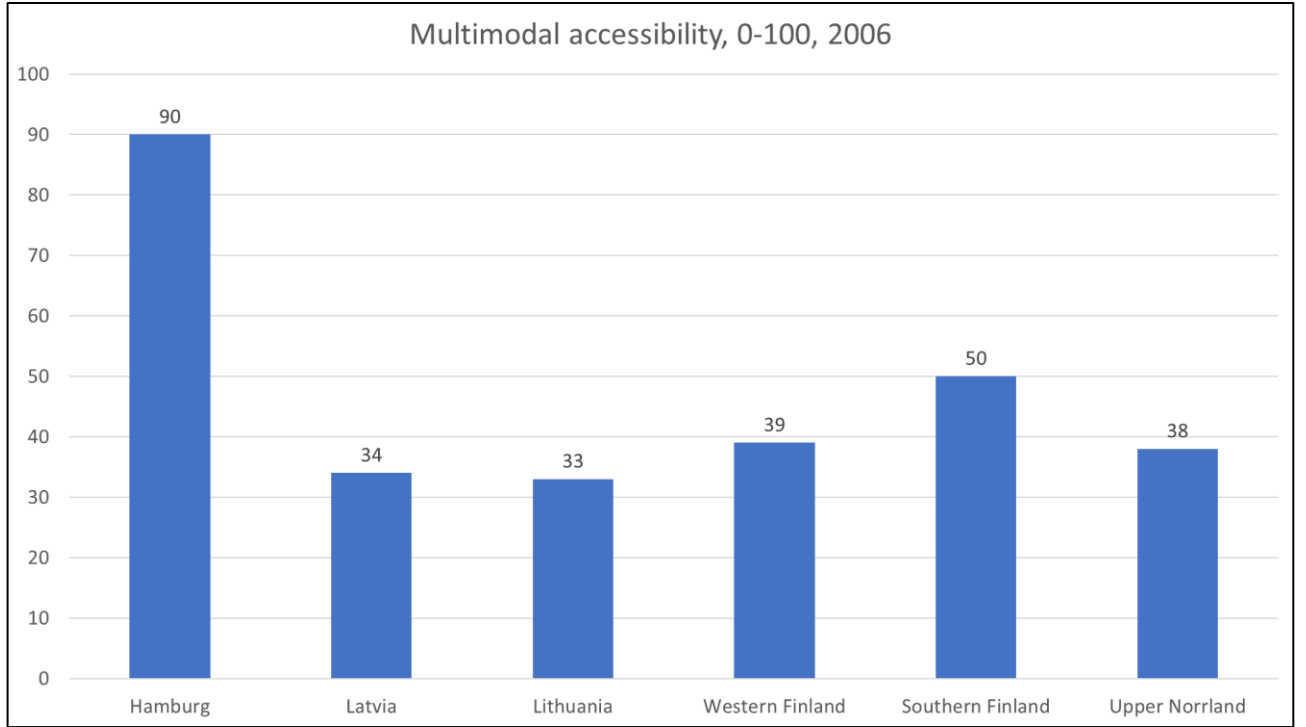


Figure 1.2. Multimodal accessibility in the areas in 2006 (ESPON, data accessed through S3 Platform 2019).

According to ESPON (2013a: 10), Multimodal accessibility is calculated through three generic types of accessibility (travel cost, cumulated opportunities, and potential) indicator, which can be calculated for any mode. In Europe, the frequency of transport routes for road, rail and air are calculated. Modal accessibility indicators can be summed into one indicator expressing the combined effect of alternative modes for a location. There are essentially two ways of intermodal transport. One is to select the fastest mode and ignore slower modes. Another way is to calculate an aggregate accessibility measure combining the information contained in the modal accessibility indicators by replacing the generalised cost  $c_{ij}$  by the 'composite' generalised cost:

$$\bar{c}_{ij} = -\frac{1}{\lambda} \ln \sum_m \exp(-\lambda c_{ijm})$$

where  $c_{ijm}$  is the generalised cost of travel by mode  $m$  between  $i$  and  $j$  and  $\lambda$  is a parameter indicating the sensitivity of travellers to travel cost. This formulation of composite travel cost is superior to average travel cost because it makes sure that the removal of a mode with higher cost (i.e. closure of a rail line)

does not result in a – false – reduction in aggregate travel cost. This way of aggregating travel costs across modes is theoretically consistent only for potential accessibility. (ESPON 2013a.)

Multimodal accessibility, or how easy it is to get to the area, reflects the geographical location of the regions. Accessibility potential indicators are based on the assumption that the attraction of a destination increases with size and declines with distance or travel time or cost. Therefore both size and distance of destinations are taken into account. Population in the destination regions reflect the size, travel time the impedance. (ESPON 2013a.)

The accessibility potential indicators reflect the relative competitive position of European regions towards European destinations. Hamburg is in its own league with a score of 90 out of 100, showing its place in the centre of the Europe. Southern Finland is second with a score of 50 out of 100, owing to its proximity to the capital region of Finland. The rest of LARS partner regions are closely bundled with scores ranging from 33 to 39 out of 100, likely due to their more distant locations and less dense infrastructure networks. However, special mention regarding the size of analytical units needs to be made. As can be seen, Ostrobothnia, Päijät-Häme and Västerbotten are part of a larger geographical areas, Western Finland, Southern Finland and Upper Norrland, because data is only available at NUTS 2-level. Oppland is altogether missing from this data.

After examination the size and relative location of case study regions, it is useful to look at the people living in the regions, in order to see what sort of talent lies within different partners. This can be studied, for example, through statistics about higher-level education, which draws interesting findings (see Figure 1.3.). Lithuania is number one in terms of percentage of working age population (ages 25 to 64) with a higher-level education, with an impressive score of 95 percent. Latvia, Western Finland (including Ostrobothnia), Southern Finland (including Päijät-Häme) and Upper Norrland (including Västerbotten) are all in a close range between 89 and 91 percent. Hamburg is at 85 percent and Hedmark and Oppland is at 79 percent.



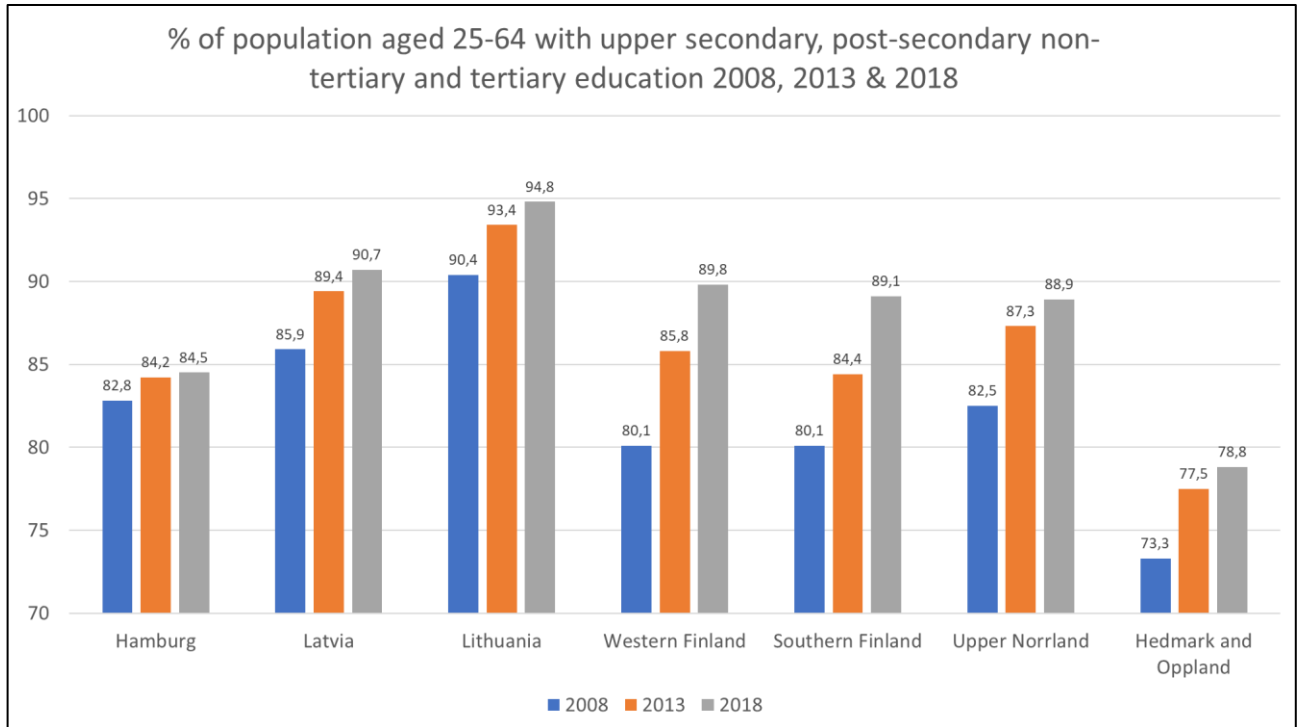


Figure 1.3. Percentage of population in the LARS partner regions in the ages of 25 to 64 with upper secondary, post-secondary non-tertiary and tertiary education in 2008, 2013 and 2018 (Eurostat 2019b).

The share of population with a higher-level education has been increasing in all case study regions. The biggest jump has occurred in the Finnish areas, with Western Finland increasing from 80 percent to 90 and Southern Finland increasing from 80 to 89. Smallest increase has been in Hamburg, from 83 to 85 percent. Hedmark and Oppland has the overall lowest numbers, although they are also increasing in a moderate pace.

In terms of just tertiary education (Figure 1.4), there are four regions, which are close to each other, with percentage of working age population with tertiary education ranging from almost 40 percent to little over 42 percent. These include both Finnish areas, as well as area surrounding Västerbotten (Upper Norrland) and Lithuania as a whole. The rest three regions range from 34 percent to 37 percent. Western Finland is a close number one with a little over 42 percent, followed by Lithuania with a little under 42 percent. Latvia is a bit surprisingly the lowest score considering the high number in the larger education level comparison, with a little under 34 percent. This means that Latvia's education is mostly non-tertiary-based.

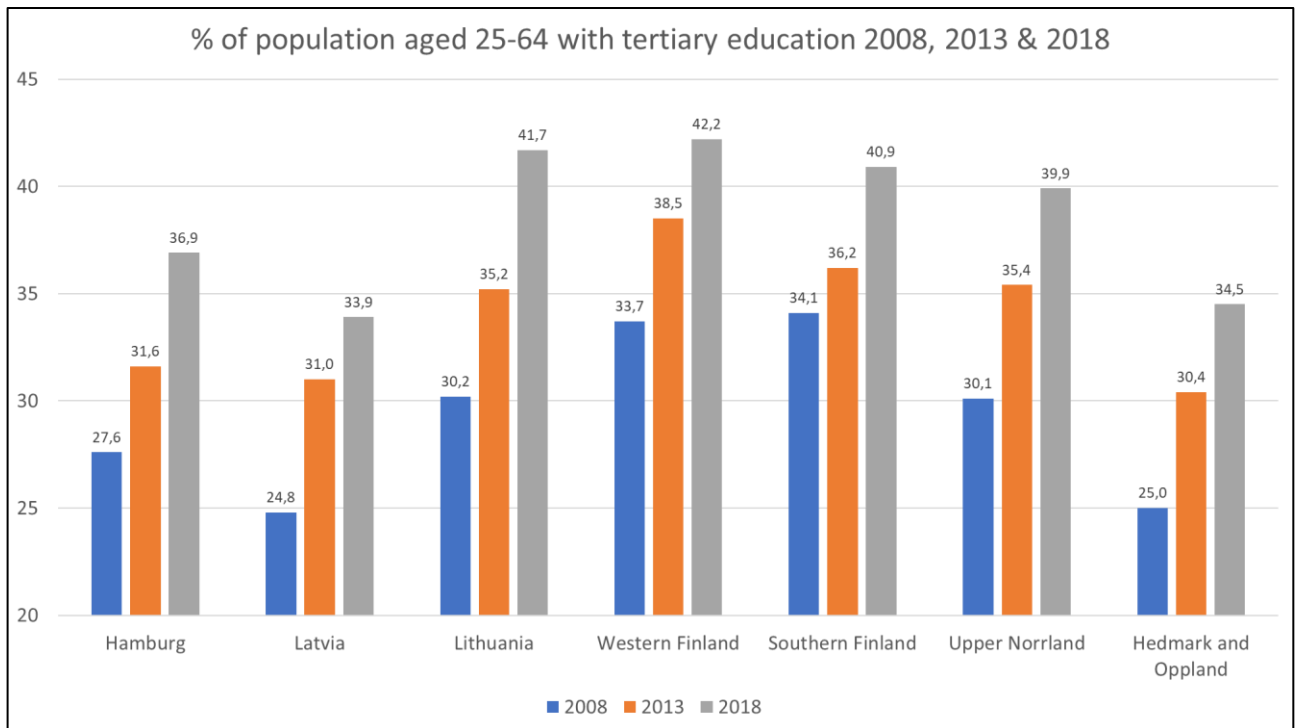


Figure 1.4. Percentage of population in the areas in the ages of 25 to 64 with tertiary education in 2008, 2013 and 2018 (Eurostat 2019b).

The shares of population with tertiary education have increased in all regions in the last ten years. The pace has been slowest in Finland, owing to the already high numbers of 2008. The largest increases have happened in Lithuania and Hedmark and Oppland, with both increasing 38 percent (12 and 10 percentage points, respectively). Hamburg, Latvia and Upper Norrland have all increased also by over 30 percent.

We can also look at the creativity of people in different regions with the help of data from European Social Survey (ESS), which is available at S3 Platform (2019). This data consists of responses of people about how important do they consider new ideas, when scale is from one to six. Lithuania is in clear lead with a score of 3 out of 6. The rest of the responses are between 2,6 and 2,7 out of six. This might indicate that creative qualities are valued most in Lithuania, or their education enhances creative thinking. Overall the scores were little lower than medium level on a scale from 1 to 6. Data from Oppland is unfortunately missing regarding this quality, but all other regions were included.

Educational and future talent needs of the regions can also be studied through sectoral distribution of employment (Figure 1.5.), which shows the similarities and differences between the regions. Public administration is a large employer in all areas, in the Nordic areas it is the largest employer. Wholesale and retail is another major employer; it is the largest employer in Hamburg and in the Baltic states.

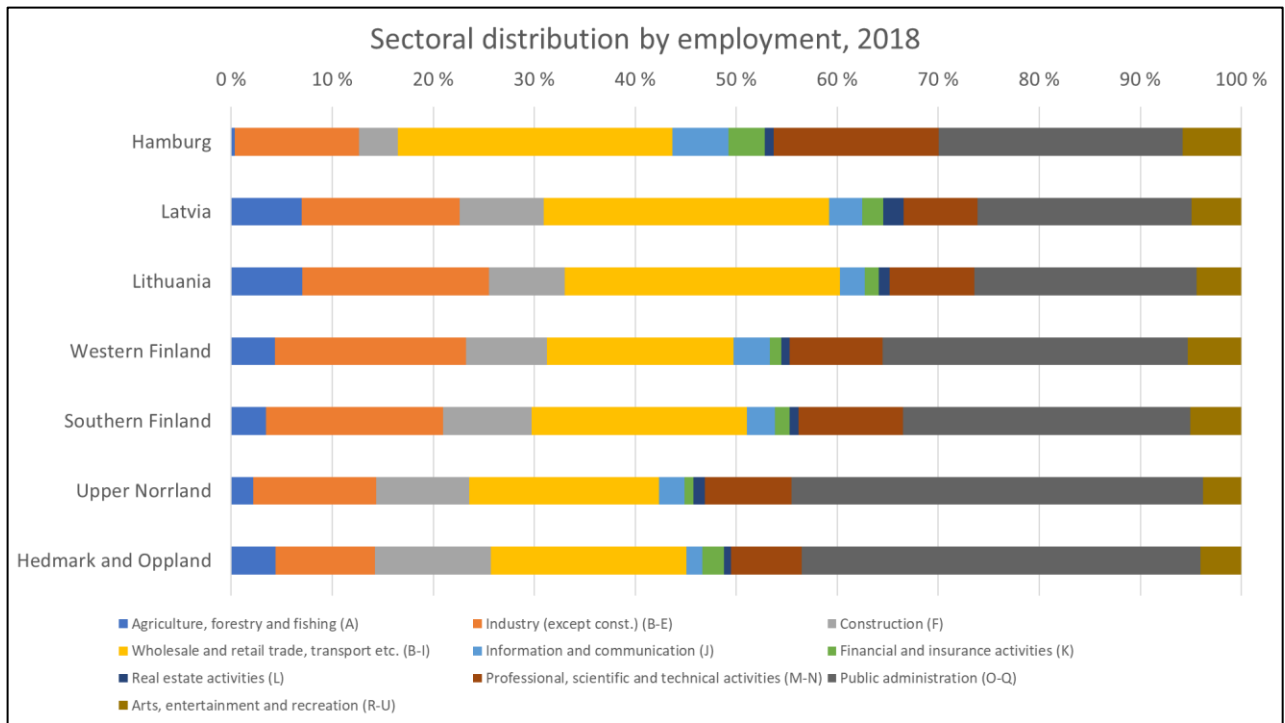


Figure 1.5. Employment in the areas by sector in 2018 (Eurostat 2019c).

Agriculture, forestry and fishing is especially strong in Latvia and Lithuania, as well as in Hedmark and Oppland, whereas it is almost non-existent in Hamburg. Industry is biggest sector in Lithuania and in both Finnish case regions, as well as in Latvia (to a little lesser extent). All case study regions have some industry, whereas Hedmark and Oppland has the lowest share of industry. Construction is significant in Hedmark and Oppland, as well as in Hamburg.

Information and communication is an important employer in Hamburg, which has twice as large share of overall employment than the next largest share (Western Finland). Similarly, financial and insurance activities employ more in Hamburg than in any other area, more than twice of the share compared to the second largest share (Hedmark and Oppland). Real estate activities employ relatively most in Latvia. Professional, scientific and technical activities employ most in Hamburg, followed by Southern Finland, Upper Norrland and Western Finland. Arts, entertainment and recreation employ quite similarly across all areas.

Industrial sectoral distribution of employment varies notably between the regions (see Figure 1.6.). Mining and quarrying is the largest industrial employer in area surrounding Västerbotten (Upper Norrland), whereas in other areas it is small or non-existent. Food, drinks and tobacco is the largest employer in Hedmark and Oppland, and also important in Latvia, Lithuania and both Finnish areas. It is

less significant in Upper Norrland and non-existent in Hamburg. Textiles, apparel and leather is significant in Latvia and Lithuania, and small or non-existent in other areas. Wood, paper and printing is the largest employer in Latvia and Southern Finland, and significant in all areas other than Hamburg.

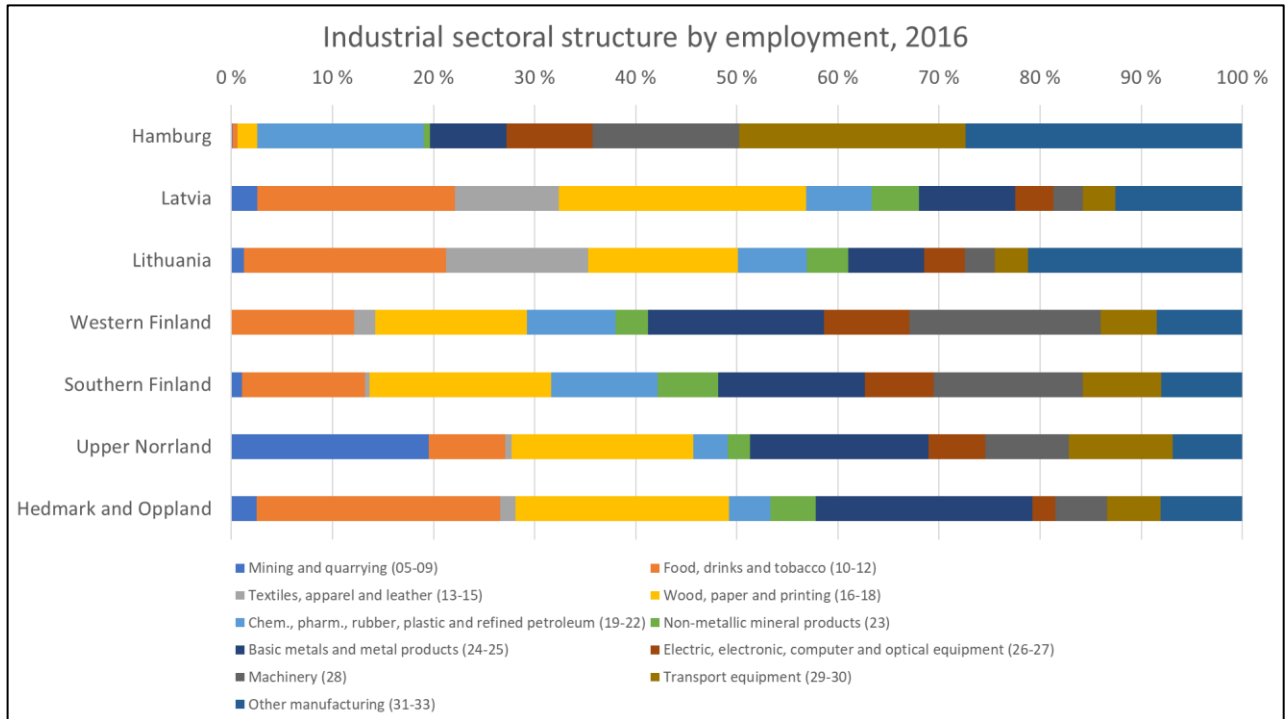


Figure 1.6. Industrial employment in the areas by sector in 2016 (Eurostat 2019d).

Chemical, pharmaceutical, rubber, plastic and petroleum is significant in Hamburg, and small in other areas. Non-metallic mineral products are small in all areas except Hamburg where it is non-existent. Basic metals and metal products is significant in Nordic areas and small in other. Electric, electronic, computer and optical equipment is largest in Hamburg and Finland, smaller in others. Machinery is the largest employer in Western Finland, and significant in Southern Finland and Hamburg. It is less significant in Upper Norrland, and small in other areas. Transport equipment is very significant in Hamburg, somewhat significant in Nordic areas, and small in Baltic states. Other manufacturing is the largest employer in Hamburg and Lithuania, and it is also varying significant in others.

We can lastly look at the international elements of the regions, especially regarding their export rates. This analysis has been done previously by Fraunhofer ISI and Orkestra, and data is available through S3 Platform (2019). As can be seen from Figure 1.7, total exports from the regions as percentage of the GDP are the largest from Lithuania, with 67 percent, Ostrobothnia is second with 51 percentage. Based on this value, it would seem that Lithuania, Ostrobothnia, Latvia and Hamburg have good

international connections, but the companies of Päijät-Häme and Oppland are directed more towards domestic markets. Unfortunately data is missing from Västerbotten.

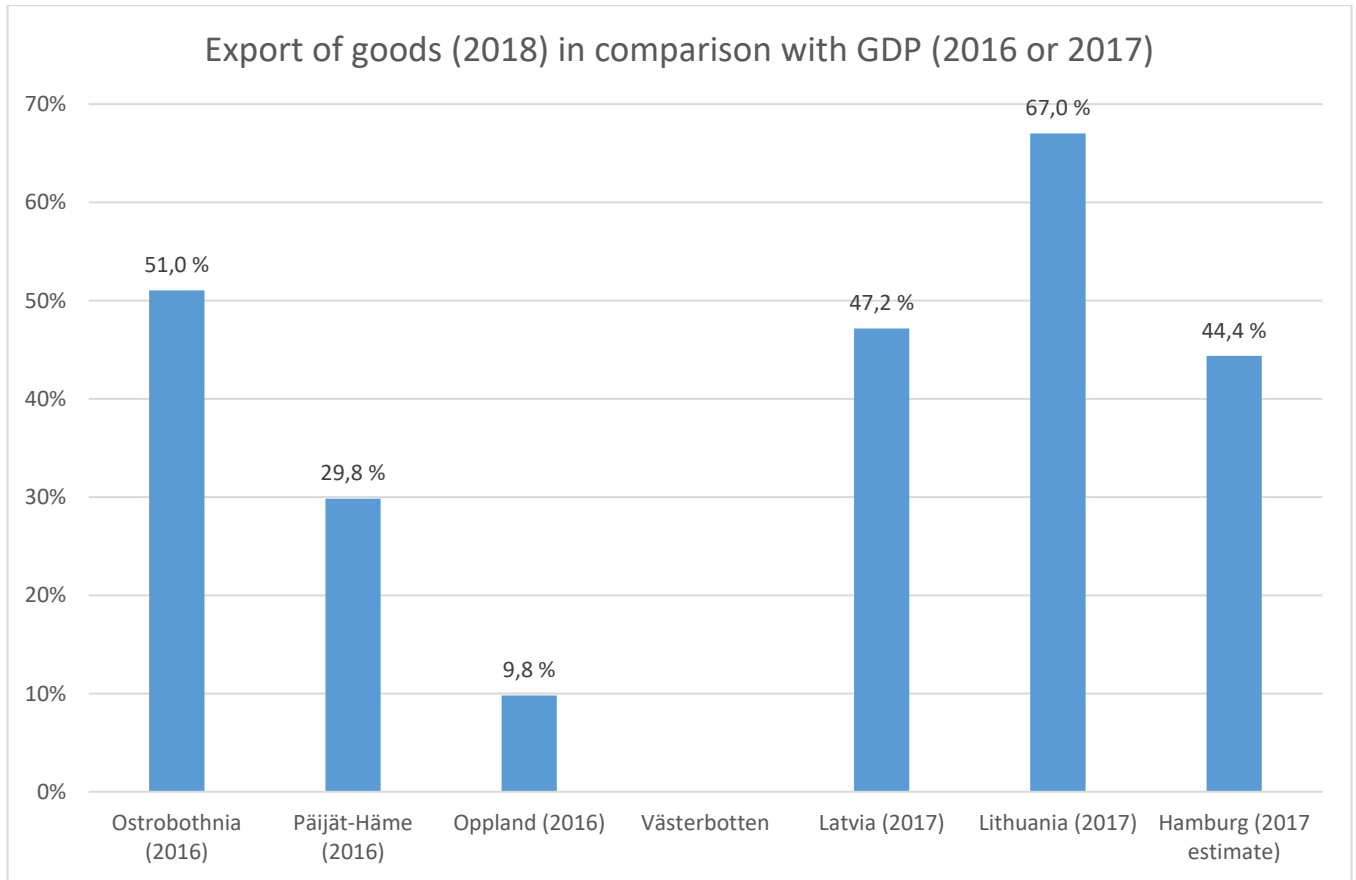


Figure 1.7. All exports from the regions as a percentage of GDP in 2016 or 2017 (Data accessed from national statistical centres).

This analytical regional comparison gives us an understanding of the regions and therefore prepares us for closer inspection of the innovation systems in the regions. However, before this there is a need to go through the process and methodology of the study, in order to explain our calculations and the process, which we used to gather them.

## **2. Good practices and gaps identified within the projects**

### **2.1. Päijät-Häme**

#### **2.1.1. Good practice: Grain Cluster**

In LARS project Regional Council of Päijät-Häme (RCPH) chosen an intervention area, Bio- and Circular Economy. Intervention area was selected via discussing with regional developers and university stakeholders. We recognized several Innovation processes and chosen the Grain Cluster, to be studied more in LARS project.

Finland's largest and most versatile cereal expertise locates in Päijät-Häme. Grain Cluster companies invests heavily in research and development. Cluster companies started cooperation in 2003 at their own will. Regional development company LADEC coordinates actions between the Cluster companies by arranging meetings and applying finance for common pre-studies.

Cluster brings together grain producers (farms), retail, large international companies (such as Fazer and Hartwall) and small local craft breweries and distilleries.

The cluster is divided into beer and beverage chain employing more than 1000 people and a breadboard employing nearly 1,200 people. At the beginning of the beverage chain there are about 450 farmers in the area and at the beginning of the bread chain 500 farmers of rye, barley and wheat. Together they have turnover over 800 million euro.

Companies are looking solutions about how to add more value on bio based side streams coming out from production. Resource efficiency and minimize carbon footprint are other targets. Now the side streams are used for soil improvement, fertilizer and feed production. Bioethanol is produced from bio based side streams. Common interest of these companies is to find innovations and solutions to use side streams more effectively.

The Grain Cluster has been a good practice in our region already 15 years. The cooperation of local grain industry based on their own initiative has played a significant role in shaping the industry of the whole area. It brings together all actors in the region, from grain producers to industry and retail, from large international companies to small craft companies, e.g. oat mills, breweries, a malt producer and over 1000 farms. The cluster companies look for synergies, product development and circular economy solutions from the side streams of cluster companies.

Main reasons why the Grain Cluster has been established almost 15 years ago was:

- education available at the schools of region was not met with the needs of grain industry

- as an employer grain industry was not attractive and
- grain industry and Lahti region is home to Finland's most extensive and diverse grain processing chain, but visibility in the strategy of the region was small before the cluster was established.

Collaboration has raised the profile of the whole industry and its actors regionally and nationally but also internationally.

Cluster is now looking for change and new ideas to develop its actions from cluster to ecosystem.

#### *2.1.1.1 The good practice story*

Over 15 years ago regional development company was supporting strongly companies to do more cooperation and gathered clusters in wood, furniture and mechatronics. Grain and beverage industry didn't get support from region then, so companies started to do cooperation themselves. There was a need to make grain industry more widely known. The common will and challenges; and urge to join forces to make grain industry visible, was strong then and still is. Other clusters haven't done so well.

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First common challenge for these companies was the waste of resources. Companies were looking solutions about how to add more value on bio based side streams coming out from production. Now the side streams are used for soil improvement, fertilizer and feed production. Bioethanol is produced from bio based side streams. Plant is located within one of the cluster companies, Hartwall Ltd.

Resource efficiency and minimize carbon footprint were other common targets and challenges. Companies have ongoing research and development projects to find solutions and innovations.

#### *2.1.1.2 What contributes to regional connectivity?*

Grain cluster has big role in developing and improving cooperation between food and beverage industry companies in Päijät-Häme. Cluster is company driven, so it has been easy to new companies to found cooperation interesting and useful.

Cluster companies has been a driving force to regional and national universities and research institutes to study the reuse of side streams and resource efficiency overall. Thru research projects and regional development (Ladec Oy) coordination, cluster have been able to use expertise and knowledge brokers, for finding suitable resources and funding for their RDI projects.

Company driven Grain Cluster has connected also other regional actors to development work. Cluster cooperation has improved region's image as a source of clean water and food internationally.

Other highlights about project's regional connectivity:

- Companies and grain producers are located close to each other. Collaboration is easier when the distance is short
- Companies operate in the same business area, but they are still different enough that the competitive position does not prevent cooperation.
- Cooperation projects are based on common challenges like resource efficiency, circular economy, carbon sequestration and energy
- Cooperation is voluntary. The strength of the operation is loose and free cooperation model between completely different independent companies and players with different sizes. All the members are equal, and everybody have "one vote" despite of the size of the company. Cooperation opportunities are searched and implemented within the rules of competition laws.

Each member can decide independently participation to the common projects and if/how much money and time they are investing to the joint projects. Membership doesn't directly obligate company to anything.

#### *2.1.1.3 Which regional or national factors enable the achievement?*

When cluster model was adapted as a development tool, over 15 years ago, regional development organisation was supporting companies to start cooperation and cluster work. Grain and beverage industry didn't get support from region, so companies started the cooperation themselves. The common will and challenges; and urge to join forces was strong then and still is. Other clusters haven't done so well.

Regional development company has been supporting by offering some coordination resources. National and regional funding has been offering funding for joint projects of company networks. Some funding required strongly cooperation.

Nevertheless, some factors that enable the achievement

- Support of regional development company – coordination and projects



- Regional and national universities and research institutes via development projects and project funding

- National funding - Business Finland BF (Finnish Innovation Fund). BF program funding is available especially for cooperation projects between companies and educational institutions.

- Three of the cluster companies are big, global companies and have leading role in cluster

#### *2.1.1.4 Which are the activities that contribute to failure or success?*

- Circular Economy is one of RIS3 priorities in Päijät-Häme. It has been connective theme for grain cluster companies long before CE was chosen one of the regional strengths. First joint project on handling and utilization of by-products from industrial processes started over 10 years ago.

- Challenge is that regional universities do not offer the core knowledge that grain business needs

- Cooperation with universities is one of the important ways to fund innovations and research. Now grain cluster companies cooperate with national actors rather than regional -> that means less funding and expertise to our region

- New cooperation models are needed especially between educational institutes and universities.

- If the collaboration between universities and companies would be more intense, more funding could be directed to the region.

#### *2.1.1.5 In what degree the achievement is possible in the context of the other region?*

Transferability could be easier if it is possible to find common challenge or crisis that combines actors. Cluster cooperation is more fruitful if it is company driven. Companies must have developing oriented mind set.

### **2.1.2. Gaps**

Overall, our gaps in Päijät-Häme were small. Biggest gap in values was between public sector and NGO's. NGO's in this case are companies interest groups and farmers' union. Public sector is having big expectations towards NGO's. That's partly because of lack of knowledge, what can NGO's role be in innovation process? NGO's have expertise but they don't have resources to facilitate cooperation. When discussing with respondents this gap between public sector and NGO's didn't come out.

Instead gaps between universities and companies and gaps between companies and public sector were small, but many challenges were identified in discussions and in focus group meetings. When the gaps are very small, the change of “old habits” can be difficult to justify.

#### *2.1.2.1 University/ public sector – company cooperation*

Universities must be more active in contacting and communicating to companies about their research and development services. University and research institutes representatives must learn to use language that companies can understand. Companies also expect that project managers and researchers have done their homework about businesses and can provide focused cooperation that adds value. Silos identified in cooperation between regional universities must be dismantled. Now cooperation looks good in theory but in practice joint projects has difficulties with sharing trust and information. University units, also internal units, are fighting for same funding. This causes also mistrust and that ideas are not shared. That leads to situation that universities and universities of applied sciences are doing similar projects which is waste of resources in regionally.

Business environment changes fast, so educational institutes should provide flexible and rapid training and education that companies can get skilled workers fast. Research and development services of universities need to respond to companies' needs to some extent. Grain cluster companies don't get the expertise they need from our region.

Shared view was in this meeting that region needs more expertise and skilled workforce. Same things came up at the previous focus group meeting in January 2019. Companies in Päijät-Häme region are mostly industrial SME's and managers of companies are rarely highly educated either. Universities and public sector need to teach and encourage companies to use student projects and master thesis as a development resource.

It is important to start building new connections across territorial borders to bridge the gap of missing expertise and knowledge. Links need to be established between all actors widely, not just between single company and research institute.

Public authorities should be more proactive to companies and to universities and provide regularly up-to-date information about EU/national/regional funding possibilities and development projects.

## 2.2. Oppland

### 2.2.1. Good practice: Wood Cluster

The project Research-based innovation in the regions (FORREGION) is a three-year project and a collaboration between Hedmark and Oppland county authorities and the Norwegian Research Council.

FORREGION promotes a greater focus on R&D activities in businesses with little or no R&D experience in order to increase their internal capacity to innovate, create value and their competitiveness. By promoting research-based innovation and collaboration with researchers and scientists, we believe that the companies in the Inland region of Norway will enhance their innovation capacity and competitiveness by obtaining competence, knowledge and skills that separates them from their competitors and brings them one-step ahead of the competition.

The target group are SME's with little or no research experience. These companies might not be aware of the possibilities that lies in collaborating with a research partner or who need help getting started on a project. Many companies have challenges or a research question they need help with, but does not know where to start. This is where the FORREGION-program has its greatest benefits and stands out compared to other programs with one of the main activities, competence brokering.

#### *2.2.1.1 The good practice story*

FORREGION started as an initiative from the Norwegian Research Council with focus on research and innovation in Norwegian regions. There is financing from national level with co-financing from regional level.

The project is anchored in the regional R&D strategy and the regional plan for value creation. During the work with these plans we discovered a gap between the SMEs and the R&D institutions. To bridge this gap the regional authority and Innovation Norway started a project with competence brokers which works proactively towards the SMEs

The strategies and the financial instruments are anchored on the regional political level.

#### *2.2.1.2 What contributes to regional connectivity?*

The good practice contains trusted knowledge brokers who helps the companies identify their challenges and competence needs. The brokers are assisted by some financial measures for the companies to by R&D support.

### *2.2.1.3 Which regional or national factors enable the achievement?*

To achieve regional development and increased value creation we need more innovation. More interaction and cooperation is a crucial factor for success. This is therefore a key factor in our regional plans. These plans are in turn operationalized in different regional strategies and action plans.

### *2.2.1.4 What factors that can lead to failure of implementing this good practice in other regions?*

It is important to keep the development-focus on a realistic and relevant level. If the expectations from the R&D institutions and brokers are too ambitious the companies will be sceptical. According to the figure above the companies are often more concerned about development than research. And for them the project itself is not the goal, but the outcome. The levelling of expectations and ambitions are important from the start. If you don't manage this from day one, the whole instrument will get a bad reputation and become irrelevant for specially the SMEs.

### *2.2.1.5 What factors that can lead to success of implementing this good practice in other regions?*

The success depends on trusted brokers and additional financial support to ignite the process in the companies. This method must also be predictable over time so the measures can be known and recognized among the stakeholders.

### *2.2.1.6 In what degree the achievement is possible in the context of the other region?*

If you are aware of the fall-pits under section 6 this can be a very relevant instrument for many regions with gaps between the companies and universities/R&D-institutions.

## **2.2.2. Gaps**

There are large gaps between expectations and experiences between universities and especially the companies and in some degree to the public organizations.

This means that the universities' expectations for these helixes are not fulfilled. The companies view the universities as less important partners than the other way around. Nevertheless, there are small

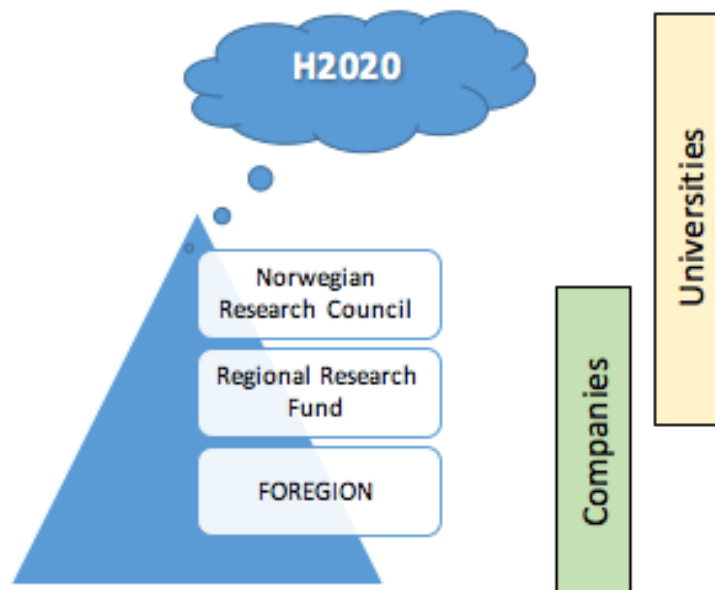
gaps between expectations and experiences on the part of the companies, but at the same time they consider the universities as less important and relevant.

### *2.2.2.1 Cooperation between Universities and Companies*

Several companies believe that the universities have little or no form of work adapted to the needs of the companies, and that they are too cumbersome and bureaucratic. They also believe that researchers do not understand enough that the companies' primary task is profit, and that research must have this in mind. The research communities, in turn, believe that the companies do not set aside enough time, or are patient enough with regard to the time it takes to plan and implement research projects.

It seems that the universities have an "image problem" and they realize that there are misunderstandings according to what the universities can offer and how they can contribute. They say that all the university's activities rely on cooperation and interactions with the businesses.

The universities are often too complicated and ambitious in their dialogue with the companies. While the universities are focusing on the desire for large international project the companies needs are often practically directed toward concrete need for further development and innovation. As shown in the figure below the companies are focusing on the lower side of the research hierarchy while the universities are aiming for the top. The first step seems to be levelling the expectations.



Another explanation is that the SMEs often lack capacity and competence in purchasing R&D. To establish relevant project the companies need some R&D competence in their own organisation.

The companies' innovation is often company-specific and often occur in their own value chain and in a customer-supplier relation. In this context, the universities are not considered relevant.

The Norwegian Wood Cluster have compiled a similar survey as this among their members, and the conclusion is that they need to be more involved in R&D, and they need a higher utilization of public schemes and funding. In their words, it is "a code that must be broken". They are aware of the need for a closer cooperation with the universities.

## **2.3. Lithuania**

### **2.3.1. Good practice: Advanced Manufacturing**

The manufacturing landscape has been experiencing steady growth combined with increasing complexity. In 5 years, the number of FDI manufacturing projects in Panevezys region grew by 316 million Euros. In comparison to 2010, average capital investment per project in 2015 has almost doubled (80% growth), whereas the average number of jobs created has increased more than 4 times.

Despite this growth, in comparison to traditional manufacturing markets, Panevezys County remains an unsaturated location. This means that there is still much potential that remains untapped. Thus, it was very important to identify areas where improvement is needed and set goals for the further growth. The main strategic initiative that drives the development of Panevezys county is the roadmap of Industry 4 Panevezys. The initiative that incorporates different activities aimed at the development of the Industry 4.0 in the region of Panevėžys.

Industry 4 Panevezys is driven by an established advisory board. It is formed of highly-qualified experts from the region's businesses, education and research institutions, the public sector, and independent experts in innovation, economic development etc. This initiative was caused by two important cultural factors: Panevezys alumni club (representing active Panevezys diaspora) are very open and active in transferring their know-how for local stakeholders: council members, business, NGOs etc. Also, region has a lot of expertise in engineering, therefore it is easier to develop new initiative using this knowledge and existing labour force.

The main actors who decided that such advisory board is necessary for the region are Panevezys alumni club and Lithuanian robotics association both of them are influential NGOs respected by local companies. Nevertheless, the most legitimate actor is Panevezys city municipality that could be considered as the most important in the region, because it has power and resources (that are limited) to foster the cooperation between other actors. Other stakeholders are also involved but their actions and co-operation are not strategically coordinated, the activities for the development of Industry 4.0 are

carried out in a fragmented manner, stakeholders are not provided with indicators, and the sustainability of their initiatives are not ensured.

The inception of this good practice was started by NGOs in collaboration with municipality which have organized annual regional forum which started the transformational process of the region strategy. These NGOs have created a new platform where experts from various fields discussed and presented economic trends in the region, urban development guidelines and opportunities, investment possibilities, urban marketing, emigration and migration, talent attraction and successful examples of innovation adaptability in business.

The purpose of the Advisory Board is to investigate changes in the development of Industry 4.0 in the Panevezys region, to identify challenges, to make proposals for solving them and to make other strategic decisions. The board helps to streamline the city's vision as a hub for industrial robotics and automation: from regional strategy to "learning robotics" in local educational institutions.

The answer to a natural question – why Panevezys should strive to become an internationally recognised robotics hub – is because Panevezys has always been an industrial city, especially lately with global engineering and manufacturing companies investing here (Schmitz Cargobull, AQ Wiring Systems, Roquette Group, etc.) – companies that have a vision to be ahead using sophisticated technologies, not least including the use of robotics. The city is rich with talent, engineering competences, scientific community that is very strongly focused on robotics and mechatronics – skills that can be applied locally, regionally and internationally. For Panevėžys here lies the opportunity to be ahead of the flow of the 4th industrial revolution and to become a recognised robotics hub in Europe.

### *2.3.1.1 The good practice story*

The process of building Panevezys county as a regional robotics centre started from the broader national and international initiatives. The economic environment suggested that Lithuanian need to start some structural changes in order to stay a competitive market in the fast-growing economy. Lithuania is no more a low-cost manufacturing country, thus companies needed to find ways to lower its costs in order to remain competitive. Also, there was an opportunity window as the whole Europe were targeting into the technologies that could improve companies' performance in industry 4.0 economy. Lithuanian Robotics Association (LRA) were the main drivers that took a role of the leader in this field and started to act as a regional influencer and an international collaborator.

LRA had an opportunity to join several European initiatives where they had a chance to participate in the international debates, get some mentorship and find examples how to "glue up" local ecosystems and deliver complex solutions.

Inspired by these learnings, in the autumn of 2017 LRA held a regional debate on engagement of regional authorities to support building ecosystem with policy decisions. The debate helped the industrial city of Panevėžys to streamline the city's vision as a hub for industrial robotics and automation: from regional strategy to "learning robotics" in local educational institutions. Discussions revolved around global robotics trends, Industry 4.0 challenges and opportunities and how Panevėžys could take the lead and become a recognised hub of robotics in Europe. It was decided that for Panevėžys here lies the opportunity to be ahead of the flow of the 4th industrial revolution and to become a recognised robotics hub in Europe. In addition to this, that year every Lithuanian region had to select their priority area. Panevezys County selected advanced manufacturing and robotics as their main regional priority and their goal is to concentrate their resources, policy, entrepreneurial and innovation capacity into development of this strategic area.

Later the strategic advisory board on Industry 4.0 strategy was established which aimed to bring together the different actors involved in the digital transformation of Panevezys County, namely companies, research and technology organisations, Digital Innovation Hubs and policy makers. The advisory board makes strategical decisions how to address big impact industry areas in the regions, facilitate a faster transition and contribute to the key value chains of strategic importance to Europe. The approach targets manufacturing SMEs who are still struggling to close the digital gap. They need less "breakthroughs" and more help in reskilling of people, prototyping new products, reframing their factories to meet digitalization requirements, adopting new business models and improving their processes. Following to this, the main regional problems were identified which affected the effectiveness of Business and public institutions and quality of educational system. Specific actions were identified in order to target each of these problems.

#### *2.3.1.2 What factors that can lead to failure of implementing this good practice in other regions?*

- Lack of skilled talents: There is a high demand for IT specialist, employees that has a background in engineering those specialists are necessary to create, implement and operate automatization and robotics technologies. If companies wouldn't have a possibility to employ this kind of employees, they would regret to start any kind of changes.

- Support from decision makers: Politicians who have power and legitimacy to implement changes in the region should be convinced that long-term strategic vision is necessary and regional government should dedicate a reasonable budget for the implementation of different activities.

- Leadership should be distributed in order to sustain the strategy for a longer time: A region should secure that there would be more than one person or organization that has KPIs related with the



implementation of a new strategy. The change or a retirement of one responsible person should not withhold the whole implementation process.

- Change of the government: If newly elected government comes with their own agenda than long-term strategy like Industry 4 Panevezys could be withhold.

#### *2.3.1.3 What factors that can lead to success of implementing this good practice in other regions?*

- Local Culture and knowledge: Industry 4 Panevezys initiative was caused by two important cultural factors: Panevezys alumni club (representing active Panevezys diaspora) are very open and active in transferring their know-how for local stakeholders: council members, business, NGOs etc. Also, region has a lot of expertise in engineering, therefore it is easier to develop new initiative using this knowledge and existing labour force.

- Communication: There should be a clear communication strategy for different target groups: young children, students, business owners, foreign investors and general public.

- Budget: The good practice is financed by local municipality as well NGOs should think about EU projects that would allow to add additional budget.

#### *2.3.1.4 In what degree the achievement is possible in the context of the other region?*

The composition and organisation of the working group, as well as the method used for the engagement of the most important regional actors for constructive discussion are really easy to learn and transfer, however there could be cultural and motivational constraints as each region should find their own ways and factors that could motivate their stakeholders. There is also a learning potential in relation to how to start the transformation of the regional strategy in whole innovation ecosystem: starting from primary schools and informal learning and continuing with the R&D institutions that develops solutions for local companies. This sequence could be change in accordance to regional circumstances, but it is important to see the whole picture of all ecosystem – education, business support services, living conditions, perception of the region, talent pool – all of these variables should be taken into consideration and some kind of action should target each of these factors. Of course, everything could be successfully implemented if sufficient financial and human resources are allocated for these tasks, therefore one of the main conditions for transferability is the establishment of digital innovation hub with sufficient resources.

### 2.3.2. Gaps

Empirical research results suggest that business actors are disappointed in cooperation partners from other helixes either on national level. Entrepreneurs that took part in the study indicated that, in order to maximize their efficiency and improve their products they have used most of the support instruments available on the market which encourage cooperation with universities or public organizations. However, according to one of the respondents not all of this support measures are very effective, cause usually public institutions are very passive and do not react as quickly as business entities need. Also, another respondent mentioned that their company tries to do everything on their own without any external private or public support, however there were few emergency cases when they were looking for an external support. These answers suggest that companies are tend to use their own resources and develop products on their own using internal resources and start to look for partners from other helixes just in case of emergency if some kind of solution could not be found within business companies.

The respondents have stated that their partnership with universities in R&D was not satisfying. Even though, in most of the time results were achieved. but the process of cooperation was clumsy. In respondents' opinion it is much easier and more efficient to work with business companies while executing R&D projects. Business entities complained that universities lack of the understanding of what is the main drivers of the private companies: companies need to come up with useful solutions that have a demand in the market, while research institutions usually create semitone solutions that needs further development, but are not ready to go into market. This is the main gap that was identified in cooperation with universities that should be target in order to strengthen Lithuanian R&D capacity.

From the other side, to the question whether entities are satisfied about the cooperation with universities in education, most of the interviewees responded that they are happy with the results that Universities are achieving in this field. Education is the area where all other entities have high expectation on universities, because education plays a vital role in developing the entrepreneurial and cooperative culture also provides labour force with essential skills which are needed while entering the labour market. For instance, informants from business sector have reported that "the high expectations are supported by constant messages from local business companies that our region needs to have access to best students and research, because there a lot of manufacture companies around with such need." Companies are usually trying to establish connection with different universities in order to acquire the most skilled young talents. Companies together with universities are creating student internships programs also invites researchers to work with the projects that they are developing. These are the main

means how companies try to attract talented young people in to their teams. Still, business owners had some proposals how study programs and education could be improved. They feel the need of more entrepreneurial and cooperative skills and universities should step up to resolve these issues. Another great gap was identified among companies and public institutions, as companies usually have very high expectations, however, public organization struggle to meet those needs, especially on a national level. Empirical research also reveals that companies view public organizations as vital players in developing the innovation ecosystem. As consequence, public organizations must direct their resources to create an entrepreneurial and cooperative culture among all innovation actors. Nevertheless, business tries to adapt to the situation and find the way to cooperate, because they need to get a public financing for their R&D projects. It was suggested that business should not be the only one that tries to adapt to current situation, in order to move forward public organizations also should listen and respond to business needs.

<b>National</b>			
Companies	1.23	0.78	Universities
1.63	0.73	0.00	0.00
0.25	1.33	0.25	1.11
Public	-0.25	0.63	NGO's

*Table 1 Quadruple helix cooperation – national expectations – experience gaps*

## 2.4. LATVIA

### 2.4.1. Good practice: Metal Industry

In the first step, several good practices were found during the analysis. Three good practices were found during interviews with stakeholders – companies, universities, public organisations, and NGOs. In order to find exact good practices, it was important to gather together all the information that we had from interviews and try to find common ideas/words/initiatives which were mentioned in answers from more than one partner.

To verify the chosen practices and in order to choose one practice which later can be used as a good example for other partners, we organized a focus group meeting in January. During focus group meeting all good practices were presented and the feedback was provided. After that, a detailed analysis of all three good practices was made. In this analysis, such factors were analysed – drivers, main actors, connectivity, the importance of involved stakeholders, first mover, main learning, etc. The three good practices were – NGO as a cooperation platform; Specific projects from companies to universities;

Internships between universities and companies – but not only for students but for academic personnel and employees of a company. After analysis and comparing all practices, one good practice came out as the best example – a business NGO as a cooperation platform.

MASOC – the Association of Mechanical Engineering and Metalworking Industries of Latvia is a voluntary non-governmental organisation that was founded in 1994 as the industry-informative Advisory Centre to promote the development of the sector as well as to facilitate mutual cooperation and professional development of specialists in the sector.

At present, the Association brings together around 165 leading engineering and metal processing companies, as well as companies of related industries. MASOC companies together employ around 12 000 employees, the aggregate turnover of companies in 2017 was more than 730 million EUR.

The Association's mission is to represent the members' interests and to conduct joint activities and projects that contribute to the development of members' competitiveness and the development of the sector. The main activity types include:

- **Education, human resources development and youth attraction.** Cooperation with all major professional and higher education institutions and the Ministry of Education and Science is organized, as well as activities for attracting young people to studies of engineering sciences and industry related occupations are being implemented;

- **Representation of interests.** Cooperation and dialogue with public administration institutions is provided constantly in order to contribute to solving the issues important for industry development;

- **Mutual cooperation and collaboration.** Mutual cooperation and collaboration is promoted through the implementation of joint projects and activities, as well as by providing the necessary exchange of information;

- **Marketing and export promotion.** Products, technological capabilities and cooperation offers of the association members are promoted at international exhibitions, visits and trade missions;

- **Information.** The development trends of the industry both in Latvia and in the main export markets are constantly analysed;

- **Research and innovations.** The development of new products is promoted within the competence centre. Students are involved in the development of new products, attracting them to constructor, design and product development activities defined by the companies within the Student Design Office.

As we can see, the area of MASOC is quite large but from the point of RIS3 and quadruple helix model, the last activity is the most important.

After the one good practice was chosen we verified it with different stakeholders during the transnational learning seminar. Stakeholders admitted that good practice is well chosen.

#### *2.4.1.1 The good practice story*

As MoEPRD is not involved in our own good practice story, in order to understand the story behind it, we visited the association once more (the first visit was during interviews on last year) and had a conversation with the chairman of the board and chairman of the council of the association.

MASOC as NGO was established in the year 1997. But the routes of this organisation started even some years before but at those times there were just two options to establish an organisation – either private limited company, either joint-stock company. There wasn't such a type as NGO, so at first, it was founded like a non-profit private limited company.

The starting point was very trivial. 30 years ago Latvia wasn't an independent country, it was a part of the USSR. During those times the metal and machinery industry in Latvia was a very well developed industry. But as we know the economic system in the USSR was completely different than nowadays. At those time everything was controlled by socialism. After the collapse of the USSR at the very beginning of 90ies, a lot of things changed in a very small time span. Also, the economic system changed from socialism to capitalism and it meant that the thinking, approaches, markets, etc. need to be adjusted to the new system.

Owners of companies working in the industry understood that they don't have any more ways to communicate, phone lines are not working properly, Internet doesn't exist but the companies need to work, to pay salaries, to sell their products. So one day a group of owners came together and addressed one person – can you help us. Of course, they didn't address just some random person. They addressed the person who previously was working in the public sector (nowadays we would call it – ministry of economics) and especially with these companies. After some conversation, they understood that they need to move forward with this idea and established an organisation.

At the very beginning, they had a lack of knowledge and experience on how to work in the world of capitalism. So they went to several visits to Germany where the traditions of this industry and cooperation models have a much longer history.

If nowadays MASOC has several functions and it has developed the scope a lot (more description could be found in the first section), at the starting point the aim of the association was only to work as consultation/info centre. They helped companies to find new markets (because the existing one collapsed), to visit international exhibitions, etc. So the first drivers (movers) were companies with their need to find new markets and information. If before 90ies we had a deficit of all sorts of products, then after 90ies it was in a completely opposite way – there was a product but nobody wanted or was able to

buy it because together with the USSR collapse the financial market collapsed as well and nobody had money.

As a partner, we could mention Riga Technical University which helped with their knowledge. The common goal was to establish a system for cooperation because the old system wasn't working anymore. As helpers, we could mention public organisations.

We could state that the gap at the starting point wasn't even between different actors of the Q4 helix model. The gap was within one stakeholder – companies. If we compare gaps now and gaps 25 years ago we can see that initial gaps have been bridged but other gaps have appeared. So it means that MASOC needs to work further and to continue their activities.

Associations itself admitted that not all the companies from the industry are members of the association. The explanation is that nowadays companies can find information, organize events, trips to exhibitions and establish international connections by themselves. The important factor for changes was the change of generations. Nowadays heads of companies are with completely different mind-sets as those 25 years ago. So the association needs to find their new niche and new gaps which they can bridge.

As their future association sees that main directions will be the same – long-term activities such as monitoring the industry at global level, lobbying, representation of interests, education, cooperation activities and short-term activities – projects from companies to universities, for example in the field of digitalization and robotization. The representatives of the association said that in their mind the role of universities will not disappear. Even more – the role will be even bigger so this will be the field where MASOC could take bigger role. Cooperation with universities is seen more like in engineering not so much at the professor level. The development of new products and new technologies together with other stakeholders is another direction association could take their place.

#### *2.4.1.2 What factors that can lead to failure of implementing this good practice in other regions?*

For mostly every good practice factors that can lead to failure in implementing it in other regions will be different and they depend on specific situations but we can see some common factors which other regions probably will face if they will want to implement this practice:

- State changes the rule of the game. As one of the main tasks for NGO is to represent the interest of companies it takes some time to find some common sense and agreement between different companies. Once the position of the industry is set, the next step is to address issues and recommendations to policymakers. But if the state actors are weak and they lack strategical view, there

can be situations that policy has changed comparing the moment when it was started and the moment NGO addresses the public organisations;

- **Crisis.** As this NGO represents certain industry they are very dependent on the situation in global markets. Of course, NGO by itself cannot affect crisis in the global economy, but this type of cooperation relies on the stability of internal and external markets;

- **Companies lack involvement.** For this type of cooperation it is very crucial to have the relevant stakeholders on board. If companies with high power, legitimacy and urgency are not members of the association, the question – what do this association represent – could arise. It isn't an issue of money because member fees are relatively small comparing to the revenues of companies. It is more about how to show for companies who are left outside that they also can get some benefit if they will be a part of the organisation;

- **Lack of common goals and leaders.** As this type of cooperation is based on voluntary principles it could fail if stakeholders won't have a common goal and there won't be strong leader which on one hand is competent about the industry but on the other hand, is neutral - that he or she is seen as a representative not for one company but the industry in general.

#### *2.4.1.3 What factors that can lead to success of implementing this good practice in other regions?*

As well as with factors for failure, for factors for success – they depend on the situation but we can find some overall factors:

- **No actors at the moment.** If at the region the industry has power but for some reasons, companies haven't managed to create a cooperation platform (maybe because companies see other companies as rivals, not partners and they lack trust among each other), the idea of NGO as an intermediate could be useful;

- **No internationalization.** Let's say there are companies, they cooperate with each other at the local level but the international part is missing. The level of internationalization is so low that companies would like to be more connected at international level but they don't know where to start, what to do etc.;

- **Lack of competence.** As the goal for association is also to promote R&D among companies, this good practice could lead to success if at the region these skills are missing. The strong point for this and the previous factor is that employees of the association (comparing with employees of companies) have more time to spend on making international contacts, getting new competences and skills which can be later spread among the members of the association.

Overall we can say that this practice will lead to success if there is a need to bridge the gaps which this good practice can cover – the gap between companies and NGOs at first and with other stakeholders as well.

#### *2.4.1.4 In what degree the achievement is possible in the context of the other region?*

The degree of transferability could be divided into two parts and two cases – if there is an association and if there isn't such type of association.

If the association exists then the good practice is easy to transfer because it doesn't need many resources. The things which are needed are the willingness and common goals. Actually, what the receiving region should do – organize an exchange trip/study visit to learn more about what association is doing, how do they communicate with members, how they spread the information, etc. The strong points of this practice are that companies feel the urgency to be more involved and connected and NGO represents not only the interests of one company but the interests of the industry. Also, the strong point is that public organisations work as support partners and as financial resource contributors.

But as already mentioned, the situation and transferability looks different if the receiving region needs to start everything from zero. In this case, transferability is low because the starting point for creating NGO was the collapse of the USSR and all events which followed later. As the situation in 30 years has changed a lot and the environment as well, there is basically no point to try to transfer this good practice using a historical perspective. Anyway, the idea to bridge the gaps by the help of NGO is good but then the receiving partner should try to find some example of association with a similar starting point as nowadays.

Overall we can conclude that practice is quite easy to transfer with one crucial factor – receiving region wants to bridge the gaps between companies and other stakeholders, especially NGOs. If that is the case and with NGO we understand the same type of organisation, there is a big potential to transfer this good practice. Of course, the success of transferability depends on many more factors – right stakeholders, support from public organisations, common goals, resources, drivers, etc. – but the main idea is transferable.

### **2.4.2. Gaps**

One of the aims of the transnational learning seminar was to discuss where are the gaps in our region, where are the biggest problems. As described in the comparative analysis made in WP3, we have more than one gap and they exist both at the national and international levels. But in order to later choose



good practice from a partner country and to make a pilot for implementing it, we need to choose one gap which we want to bridge because it is impossible to bridge all gaps by transferring just one good practice. One of the biggest weaknesses in Latvia is the poor availability of cooperation and information in the regions. There are almost no or few organisations that work with RIS3, innovations and development issues at the regional level. Mostly everything (especially public organisations that can support the business with specific needs) is concentrated in the capital city Riga.

It is often impossible for a business person to go to a professor/research centre or university in Latvia and to clearly define a need for research or technology. We have a quite big gap between companies and universities at the national level. There are just some opportunities for entrepreneurs to meet with universities/research institutions. Universities and research institutes are not located so close to each other, the density of companies, R&D institutions and universities is quite low; they are not so densely at each other to share the experience. So the fundamentals of clusters are missing. But clusters are very important in order to make innovations, value chains, products and services with higher added value.

On the one hand, universities would like to cooperate more with companies and to have common benefits but there is one big problem. There are companies in Latvia that have a large amount of foreign investment (and in this particular field there are many such companies) and the main problem there is that foreign investors do not want to invest in R&D because they believe that all investments should take place in the country of investors. Here in Latvia, they want just to make the product with no or low added value and later to export this product to their own country and continue to develop it there. As labour force costs compared to Western Europe are still lower but the qualification of the workforce is at the same level, so for companies, there are big benefits to use it.

But also for the companies which are owned by local capital, the involvement is currently lacking. One more problem arises with the companies which are state-owned. On the one hand these companies have resources, power and urgency to innovate but on the other hand they are afraid to risk and to fail because society doesn't tolerate failure in the public sector. But it is practically impossible to innovate without taking risk and admitting that you can fail.

As mainly cooperation between companies and universities is established on project basis (EU funds, national budget), often, when a project ends, the accumulated expertise, knowledge and experience is not further developed, many ideas disappear with the project's end date. Also, this happens because the systemically approach is missing. It is hard for companies to establish cooperation with universities on a regular basis.

## 2.5 Lithuania

### 2.5.1. Good practice: Bioeconomy

Joint efforts of a number of Lithuanian institutions and other relevant stakeholders put bio-economy among the key priorities of Lithuania's Smart specialisation strategy. Biogas production is found as a prospective activity for Lithuania aiming to reach sustainability goals. The projected benefits of biogas production as Smart specialisation development in Lithuania include climate change mitigation and reduction of CO<sub>2</sub> emissions, as well as generate additional income for independent biogas producers. Hence, developed agricultural sector in Lithuania proposes sufficient amounts of biomass and agricultural residues to be used as raw materials for biogas production in farms.

One of the key players in Lithuanian biogas production sector is Alanta School of Technology and Business (further – Alanta STB). Its main activity is professional education and research for future farmers, including teaching “zero-waste agribusiness”. Initial technical school was established in 1959 in Alanta Manor House. In 2003 Alanta STB became Public Institution for professional education. Practical research and learning basis was first reconstructed in 1973. Major modern reconstruction was done throughout the years 2011-2013. Currently the school counts over 300 students and 80 direct employees. It generates about 6% annual turnover from own services.

More precise, Alanta STB provides general and vocational training. Students without basic education can acquire such specialities as joiner, ecological farm worker. Students, after basic education can become car mechanicals together with driver's licenses), waiters – barmen, decorators. Those who have a certificate of secondary education can study further at our school such specialities as accountant-cashier, horse breeding business employee, security guard, and waiter-barman. There work qualified, experienced and loving one's job teachers, who constantly search for innovations and apply them in the educational process. Students have good conditions to apply theoretical knowledge practically. Teachers and students take part in different international projects and have their work placements abroad in such countries as Italy, Spain, Germany, Bulgaria, Norway, Turkey. Teachers deepen their knowledge and share their experience in different conferences and seminars. Students from other basic schools and gymnasiums visit Alanta STB where they learn more about different specialities and how to choose one's career path. There are a lot of events at this school. Every year they organize speciality weeks and competitions, such as “The best accountant – cashier”, “The best decorator” and etc. Students take part in many actions such as “Action week against bullying at school”, “The solution of youth problems” and others. Students eagerly participate in different sports competitions; basketball and table tennis are the most popular ones.

The mansion building, which is currently heated with produced energy from biogas, was built in the middle of XIX century. In the XX century the buildings were for several times reconstructed and restored. Now the palace is newly painted, the tin roof is changed, the paths are paved, the park and ponds are restored as well. In 1940-1946 in the mansion there was the Lower Agricultural School. In 1959 the Agricultural Technical school was established, which prepared agronomists and zootechnicians. In 1960 a building in Alanta town was given to the technical school and in the former inn school's workshops were established. In the end of 1973 the students began studying in the new school building. There were new classrooms and laboratories, new equipment – strong material technical basis was created. New complex, where now there is a gym and concert hall, was built according to individual project. In 2002 the school changed its name into Alanta STB and in 2003 it became the Public Institution Alanta STB.

Biogas plant is an additional activity for Alanta STB. It was established in 2013 and counted 1,2 MW (Megawatts). Main reason for establishing biogas plant was teaching and experimental basis for “zero-waste agribusiness” for future farmers.

Collaboration for smart specialization both nationally and internationally plays very important role for the vitality of such science and education public institutions as Alanta STB in Lithuania. In this case biogas plant is a completely unique initiative to serve the public interest. It was developed and promoted by the leader - director of the school which is a total innovator. This biogas plant does not hold any commercial interest. It was built aiming to educate future farmers of core principles of circular and bioeconomy in actual practise to run “zero-waste agribusiness”. Overall collaboration experience regarding innovation in biogas was identified as very valuable by school's leaders.

Alanta STB is among key players in the game from the very beginning of biogas plants establishment and biogas production initiatives in Lithuania. At the same time it holds high legitimacy, urgency and a bit less but even sufficient power to interact biogas sector in Lithuania. It was identified as a perfect case to investigate the issue, since this institution represents one of the actors of Quadruple Helix (academia), has relations with the rest of helixes (government, business and NGOs) and at the same time it holds all relevant information regarding the biogas production development in Lithuania from the very beginning up till now.

#### *2.5.1.1 The good practice story*

Why this process was started?

Alanta STB decided to start the initiative - construction of a biogas recycling tank and a cogeneration power plant in Alanta STB Campus, Naujasodis village, Molėtai district, Lithuania in 2013. The biogas plant establishment was initiated due to the several reasons. First, Alanta STB should

effectively manage the outcomes of multiple activities, performed by the school as general and vocational education provider for future farmers and household workers. The school holds big experimental basis for training agricultural specialists of various specialties. It has a good material base for apprenticeships: cattle farms, a training farm, occupying almost 100 ha of their own land and about 300 ha of leased land, and workshops. Part of this consists of about 250 cows and cattle, which are kept on the Alanta STB experimental barns.

The main raw material for biogas production is organic waste of various origins. Some wastes are difficult to decompose and produce less biogas, others are lighter and result in higher biogas content with higher methane concentrations. Organic waste from agriculture, livestock farming, part of urban municipal waste, sludge from urban water treatment plants and process waste from food processing plants (unless used for feed or other purposes) is used for biogas production.

The Alanta STB base therefore was seen by school's director and administrative team being in a favourable position to install a biogas plant that uses livestock manure and pig slurry as raw bio material, as well as various animal waste, by-products and other agricultural waste not used from the slaughterhouse. The distance from the biogas plant to the source of raw bio material for the biogas plant was minimally short. The existing capacity was decided to be used to store the recovered biomass. The tanks were enclosed so there were no new potential sources of odour diffusion. The installation of biogas plants was seen as one of the means of combating negative odours. Recycling of biomass had to reduce the number of unpleasant odours, thus reducing the local community's dissatisfaction with experimental activities, performed by the school.

According to the environmental effect assessment, the planned economic activity by Alanta STB did not contradict the solutions of the master plan of Molėtai district municipality, the regulations of Land use and protection, the protection of the natural landscape, the territory of natural and cultural heritage, the development of tourism, as well tourism, engineering infrastructure and communication system.

The project itself, i.e. the biogas plant for processing manure and slurry, green pulp, milk whey and slaughterhouse waste from the Alanta STB was focused on saving resources, reducing environmental pollution, and using renewable energy sources for power generation. Biogas production and organic waste shall reduce fossil fuel consumption. The biogas is burned in a cogeneration, i.e. in an internal combustion engine. Cogeneration is one of the most efficient ways of producing energy. The overall utilization rate of primary energy is 85 percent, while in thermal power plants it is only 40 percent. The heat generated in the cogeneration was planned to be used to maintain the required temperature in the bioreactor and to maintain the temperature in the pasteurisation vessel.

Manure and slurry was before stored in open tanks. Manure and slurry are subject to aerobic decomposition of organic matter, which releases methane into the environment. Methane contributes

about ten times more to the 'greenhouse effect' than its carbon dioxide (CO<sub>2</sub>) produced during combustion. Thus, biogas combustion is one of the measures to reduce global warming and greenhouse gas emissions.

The processed biomass was planned to be used as fertilizer for field fertilization. During the cold season, recycled biomass is currently stored in new designed tanks. Its export to the fields is performed only during the warm season according to the requirements of the laws and regulations of the Republic of Lithuania. It also limited the amount of biomass spilled per unit area of soil. Fertilizing the soil with recycled biomass reduced the use of mineral fertilizers.

Processing the resulting liquid manure and slurry into biogas reduced the number of odours released in the area. Anaerobic digestion of organic waste in bioreactors first breaks down the most easily decomposed hydrocarbons into biogas, i. those substances which emit unpleasant odours in open manure storage areas. Only part of the most difficult-to-decompose organic matter is left in the processed mass, which has a negligible number of unpleasant odours. Also, the release of odours into the environment during the irrigation of waste fields was reduced. It can be argued that the construction of a biogas plant was one way of combating unpleasant odours. High-noise equipment was installed indoors, insulated with noise-absorbing materials. The surfaces of tanks and pipelines with a wall temperature greater than 45°C are insulated with special insulating materials. Localized collection and exhaust ventilation systems are installed where hazardous materials are spilled.

Who were the actors?

All four helixes took part in the establishment of good practice in Lithuania, in Alanta STB.

The key player in the good practice and the initiator of the good practise is the director of Alanta STB Vidas Puskas. He was highly supported by the administrative team of the school and other so-called profession-addicts: head of specialty teaching Mr. Stasys Skebas and operator of biogas plant Petras Zenevicius (*academia-driven* team).

*Government helix* actors consist of field-specific ministries of the Republic of Lithuania: Ministry of Energy, Ministry of Environment, Ministry of Education and currently - Ministry of the Economy and Innovation. At regional level, Alanta STB hold good relations with local municipality and acts as part of Molėtai municipality waste management system.

*Business helix* takes part in this good practice from two perspectives. One perspective is related to the technical establishment of the biogas plant. Thus the key installation of the biogas plant was subcontracted by joint stock company "Mafula", which does not exist anymore. Hence, JSC "Mafula" should provide technical assistance for the gas plant. Currently these functions are mainly performed by the operator of biogas plant, who is an expert and extremely keen on all technical issues of the biogas plant and energy productions process. He acts as intermediary now searching for necessary information

and technical assistance needed to make the biogas plant work properly. Another perspective is related to necessary bio material provision for the biogas plant operation. Thus Alanta STB holds contracts with regional milk processor JSC “Rokiskio sūris” branch “Utenos pienas” and some smaller catering service providers which provide additional necessary amounts of bio waste from meat production and unused food for biogas plant proper operation.

*NGOs or society helix* actors are mainly related to local community. Local community takes part in the process as it resides in local environment, which is currently protected from bad odours from experimental basis of cattle at the Alanta STB. Community members take working positions at Alanta STB, volunteer and also, on demand, acquire necessary professional education on “zero waste agribusiness”. Environmental organizations are happy about the activity taken by the school due to environmental protection.

Which events/processes leads to success?

There are several key events/processes which lead the good practice to success:

- clearly identified need for the establishment of a biogas plant;
- precise and deep analysis of environmental, economic and social factors, that are relevant in the close and remote Alanta STB environment and clear statement of current situation;
- well-planned processes of biogas plant establishment;
- successful overcomes of institutional and legislative barriers due to the restrictions in regulatory basis due to the managerial excellence of school's director and team.
- continuous monitoring of biogas plant operation, performed by Alanta own internal expert (biogas plant operator), who was in process from the very beginning.
- continuous exploitation of innovation - education on using biogas plans for “zero waste agribusiness” for future farmers and other interested parties.

#### *2.5.1.2 What contributes to regional connectivity?*

The Alanta STB contributed to the regional connectivity in several aspects:

- Networking was accelerated among all for helixes of academia (university), government, society and business, which was necessary to establish the innovation in bioeconomy and circular economy. Biogas plant establishment was accelerated by scientific technical investigations, which built the background of biogas production from manure and wastes technically. Government institutions should network to create favourable environmental and economic conditions to ensure the biogas production and consumption via grids. Business side was put into network when building the equipment and ensuring the sufficient amounts of bio wastes to be supplied to make biogas plant work. Alanta STB acted in

network as basis provider and connector of society to learn the innovation to be spread in “zero waste agribusiness” practices in future farms. Societal side acted as consumers of favourable environment clean with unwanted odours.

- Knowledge brokers in this case arise from Alanta STB management body and graduates, which serve as multipliers of good practise to be used in future “zero waste agribusiness” farms, run by school’s graduates.

- Institutionally, Alanta STB established unique experimental basis of biogas production plant, which might be used at the same time not only for practical reason – biogas production from bio wastes in school, but also for teaching and demonstrative purposes. Institutionally, Alanta STB acts as initiator and mediator for accelerating regional connectivity due to the established good practise which united all helixes to act for common goal of the state and region in the field of smart specialization in circular and bioeconomy.

#### *2.5.1.3 Which regional or national factors enable the achievement?*

The Alanta STB context of the good practice takes into account several important regional and national factors.

First, there were particular barriers set by government regulation in the fields of energy and environment, which were not aligned together for reaching the common goal of smart specialization in circular and bioeconomy. Alanta STB pushed forward the alignment of necessary government regulation to make biogas production from manure and bio waste into action. Thus necessary regulation from government side in the field of biogas production from manure and bio waste stands for crucial success factor.

Crucial role in accessing external funding is played by the government, which compose possibility to access public funding through bio energy and similar programmes for innovation - biogas plant establishment.

Existing experimental and training basis at Alanta STB provided sufficient infrastructure and resource conditions for starting the innovation, ensuring its durability and multiplication of good practices.

Excellence of human resources, field-experts and so-called ‘addicts’ of their professions ensured this innovation to become live practise. Big will and high ambitions helped overcome the existing barriers and reach favourable results.

#### *2.5.1.4 What factors that can lead to failure of implementing this good practice in other regions?*

In other regions implementation of Lithuanian good practice based on Atanta STB biogas plant experience may fail due to the following factors:

- Someone left behind – some relevant parties of the helix of other important environmental, social and economic circumstances may be not be taken into account.
- Overspending – too high costs of the project, unexpected additional spending during the project development, further exploitation problems (impossible to enter the existing electric or gas grids).
- Expectations are too high – expected effect may not satisfy calculated benefits.
- Lack of human competence – good practice will not go properly without idea-addicts, who are ready to devote their time and heart to the operation of the biogas plant.
- Different cultures – people may not accept the necessary processes of the biogas plant establishment and operation due to cultural differences.
- Distrust – it is a complex project which needs to ensure keeping initially dealings among helixes properly. Rapidly changing economic viability of subcontractors and/or core changes in legislative basis may result in project failure.
- Quickly changeable goals – no durable direction of the state vision on bioeconomy, including biogas production and consumption.

Common understanding – all helixes involved, as well as all actors in helixes should agree and believe the success of the innovation.

#### *2.5.1.5 What factors that can lead to success of implementing this good practice in other regions?*

In other regions implementation of Lithuanian good practice based on Atanta STB biogas plant experience may succeed due to the following factors:

- The right people – there should be support to become right people; the initiators of the project should be able to connect all helixes together and make them act towards the same goal; special attention should be given to idea-addicts, who are able to devote their time and heard both for technical issues and for further assistance; educational possibilities of using the innovation further would be appreciated.
- Drivers with power and legitimacy – key actors should hold sufficient power and legitimacy due to the innovation argumentation, establishment and ensuring proper operation and continuity.
- Common goal – all helixes should work for the same goal, which connects the understanding, believes and expertise to make the innovation work and remain durable.
- Resources – necessary resources should be planned in advance, using possible external and internal funding. It is worth using external support schemes for cleaner energy of something similar for



establishing the biogas plant. Necessary to hold availability of accessing and ensuring sufficient amounts of bio wastes and other materials to make the biogas plant work.

- Communication – communication about the innovation – biogas plant establishment benefits is necessary to make the innovation acceptable. It is important to keep in touch with local people, broader society, government, academia and business representatives regarding the benefits they receive from the innovation.

- Trust – the key bound that ensure project success is trust among helixes in all processes of innovation. There should necessarily be a leader who connects all and ensure trust.

- Openness – innovation should be open to society and should be employed for multiplying by providing educational possibilities. Openness to broad society ensures continuous confirmation of societal benefits received by operating biogas plant without any direct without focus on profits.

- Crisis, needed to overcome – new opportunities come in line or just after the crisis. Due to difficult economic situation, in this case – huge expenses for heating and electricity in public institution's teaching basis, continuous expenses for waste management – accelerated to think positively regarding prosperous innovations which fully constitutes to circular and bioeconomy principles.

#### *2.5.1.6 In what degree the achievement is possible in the context of the other region?*

The achievement is possible to transfer into any region, which is interested in circular or bioeconomy in the field of biogas production from manure, crops and other bio residues and are interested in green energy. This good practise does hold several critical specific features. Biogas plant may be built in any region, which holds sufficient amounts of bio waste, which might be used for biogas production as raw bio material. Taking into account the specific university-driven case of Alanta STB, which processes unite all four helixes at different degrees, the achievement is possible to transfer to some regional farmer's education school, where experimental basis holds necessary physical, intellectual, financial and social resources to be put into the implementation of this good practice.

### **2.5.2. Gaps**

Empirical research results suggest that collaboration for smart specialization in biogas, which is listed among the priorities of Lithuanian Smart specialization strategy 2020 and approved by the government of the Republic of Lithuania, is performing greatest difficulties because of passive and isolated role of government institutions itself, as well as civil society representatives (i.e. NGOs) – expectations are much greater from all quadruple helix actors than actual situation, especially at national,

but also at international level, especially in university (i.e. public institution Alanta STB) collaboration with governments in the field of innovation in biogas (see picture 1).

National				International			
2,11			7,67	0,00			4,67
Comp anies	1 ,83	2 ,11	Univer sities	Comp anies	1 ,25	3 ,33	Univer sities
2,58	1 ,75	1 ,00	3,78	0,33	1 ,50	6 ,11	3,89
2,11	1 ,78	5 ,33	7,67	0,00	0 ,00	5 ,00	4,67
Public organisation s	2 ,44	6 ,56	NGOs	Public organisation s	0 ,00	5 ,44	NGOs
0,00			0,00	0,00			0,00

Picture 1. Lithuania (LloAE) – Gaps in helix

When measuring summarized expectation-experience collaboration gaps, at national level greatest gaps were found among NGOs and all three other actors: public organizations and universities (huge gap), companies (medium gap). There exist also medium gaps among companies and public organizations (2.58) and universities and NGOs (3.78).

At international level there does not exist significant differences among expectations-experiences from public organizations towards the rest three actors. This means their expectations meet actual practice: no need and no will to collaborate for innovation in biogas. Greatest average gaps were observed among NGOs and the rest of actors when compared collaboration expectations to experiences. Besides, exceptional average collaboration mismatch among expectations and experiences was observed by universities towards public organizations.

In the particular case of academia(university)-driven good practice, Alanta STB, greatest problems regarding collaboration for biogas production as innovation was observed by school's leaders in collaboration with public institutions, whereas, general national situation is not favourable at all for such public-interest-servants as Alanta STB. They hold bad collaboration experience with national government, good - with local and regional administrative units and international partners.

The overall actual need was recognized to accelerate Lithuanian government institutions to be more open for collaboration regarding innovations, since its primary role is to serve the public interest and should be focused on wealth creation for general public, which might be easily accessed through acceleration of smart specialization in biogas, accumulated in livestock farms.

Greatest collaboration gaps are tightly related to the isolated position of Lithuanian NGOs regarding collaboration for innovation in biogas, which is recognized as non-existence of appropriate representation of public interest from third parties which primary mission is to do so. Towards all quadruple helix actors NGOs highlighted dissatisfaction regarding collaboration. This might be aligned towards one of the characteristic features of immature democracy, where the role of NGOs is still a resting potential. However, further in-depth research is on demand to explain the exact reasons for that more precise.

## **2.6. Hamburg**

### **2.6.1. Good practice: Circular Economy**

Resource efficiency and waste management is a matter of growing concern in European countries. Consumption and the quantity of municipal waste has increased along with the rise in population and improved living standards. However, the existing solutions to consumption and waste management in European urban and peri-urban areas do not quite meet the challenge of circular economy. To shift from the current linear economic model of take - make – dispose to circular economy where products or their components are reused and more material, energy and labour inputs are restored, innovations are necessary to transform economy and society. To promote innovation processes beneath companies, public institution and NGOs knowledge-producing organisations play an important role in this transformation. We identified European funded projects for research and innovation as good practice in Hamburg to promote the development of the circular economy.

In particular we identified a HORIZON 2020 innovation project, funded by the EU where different actors from the helices cooperate to improve the circular economy for electronic and electric equipment in Hamburg as a good practice on how to start an initiative for connectivity between the different helices. According to a value chain partnership approach, identification and involvement of stakeholder from different value chain levels was initiated in the project. Stakeholder from different levels of the value chain from public institutions, universities and companies are cooperating.

#### *2.6.1.1 The good practice story*

Germany as a European country and the city of Hamburg like all European cities has to fulfil the requirements of European laws connected to recycling quotes and waste reduction. For waste of electronic and electric equipment (WEEE). The European WEEE directive sets targets for collection, recycling and recovery rates. Since 2006, Germany has been required to submit such rates to the European Commission. Since 2016 the WEEE directive sets relative collection rates, whereby from 2016 to 2018 the target rate was 45 percent of the average weight of electrical and electronic devices that were placed on the market in the prior three years. From 2019 onward, this target rate will be 65 percent. Germany's collection rate in 2017 was 45.08 %. Having those collection rates in mind a group of stakeholders from Hamburg decided to take part at a call for proposals from the European research-funding program HORIZON 2020 in cooperation with the cities of Copenhagen, Genoa and Lisbon. The approach was to develop a cooperation between stakeholders from different parts of the value chain to improve waste management and recycling in those cities. In Hamburg the Hamburg waste management department (Stadtreinigung Hamburg), the Senate Chancellery, the recycling company Aurubis AG, the software company Consist ITU, the HafenCity University and the Hamburg University of Applied Sciences cooperated to develop the proposal for the WEEE stream in Hamburg. The objectives in Hamburg were to reduce the amount of waste, to improve the collection of WEEE, to increase the possibilities for reuse and repair and to analyse the possibilities for an intensified recycling. The proposal was successful and the project was funded by the EU with more than 9 Mio Euros. The project started in September 2016 and will end in August 2020.

Since than a baseline study was undertaken to collect and analyse data about the status quo about WEEE. Workshops for business stakeholders were organize to attract and inform external stakeholders from the value chain. For the optimization of the collection system several different pilot trials were performed. To inform the public a city-wide publicity campaign on waste collection vehicles, in newspapers, magazines and public transportation was organized. The Decision Support Tool (DST) [cycl.de](http://cycl.de) was developed and publicly advertised. A second-hand centre and iconic second hand shop was established, where electronic and electric devices were collected, repaired and sold. A PopUp-Store opened on 1st November 2017. The opening time will be extended over the project end. This shop has about 1.000 visitors per day and sales up to 200 pieces 2nd hand EEE items per day. Many activities to inform and involve stakeholders from companies, public institutions, universities and the public were organized to raise awareness. Developed value chain partnership in the project can act as an example how to improve the regional connectivity.

### *2.6.1.2 What factors that can lead to failure of implementing this good practice in other regions?*

- Competition between research institutions;
- No research institutions with the corresponding topics available;
- No public institution with high power and legitimacy;
- Companies cannot be motivated, because there are no benefits for them or the benefits are not communicated adequate.

### *2.6.1.3 What factors that can lead to success of implementing this good practice in other regions?*

- Strong research institutions with good cooperation to other helices;
- Public institution with power and legitimacy leading;
- Identification of advantages for companies, short-term and long-term;
- Communication about advantages for companies is sufficient funding.

### *2.6.1.4 In what degree the achievement is possible in the context of the other region?*

The Hamburg good practice should be transferable to every region with research institutions or good connections to research institutions with the needed expertise.

## **2.6.2. Gaps**

The gap-analysis undertaken in WP3 showed, that the innovation network is still fragmented and needs development. The motivation for cooperation of companies is very low, overall expectations on a regional level are low, therefore the gaps are relatively low as well, and the highest gaps appear for the cooperation of NGOs with companies on a regional level and for universities on national level with other universities, public organisations and NGOs. In detail the results for the different helices are:

- Companies: For companies' cooperation are not so important than for other organisations. They have low expectations about their cooperation and there are only small gaps below 1.50 between experiences and expectations. Small gaps exist only on regional level for some aspects of cooperation.
- Public organisations: For public organisations other public organisations are very important as partners and there are also the biggest gaps to find. Cooperation in regional development and innovation networks as well on regional as on national level show the biggest gaps. Cooperation with companies on an international level show a big gap as well as cooperation with NGOs regarding regional development

on an international level, as well as regarding product and service development on a national and international level show higher gaps.

- Universities: for universities the highest number of bigger gaps were identified. Gaps could be found at cooperation with companies regarding future ventures on national and international level, cooperation with public organisations in regional development on national level, on cooperation with other universities on national level regarding all three aspects education, development and research, and on cooperation with NGOs regarding regional development and product and service development on regional and national level.

- NGOs: for NGOs gaps can be found on cooperation with companies regarding production networks on a regional level, and regarding innovation networks on regional and national level.

Besides looking on the calculated gaps it makes also sense to look at the expectations and experiences institutions have with their cooperation in detail. On regional level companies have low expectations towards all other partners in the helix, universities have the lowest expectations according to their cooperation with companies and NGOs; public organisations have the highest expectations according to their cooperation with other public organisations. In general expectations are lower on national level compared to regional level, companies have the lowest expectations in cooperation with universities and NGOs, universities and NGOs have the highest expectations in cooperation with public organisations. In general expectations on international level are lower except for universities. Expectations of universities are in parts higher than expectations on regional or national level and very low for companies. On regional level: companies in general rank their experiences in cooperation as bad, especially with universities, and vice versa (experience in cooperation with companies are ranked as bad by universities). Universities have good experience in cooperation with public organisations, public organisations' experience with such kind of cooperation are not as good, but on an average level. Universities have also very bad experience with cooperation with NGOs, but the NGOs on the other hand ranked their experience with these cooperation as average; NGOs ranked their cooperation with companies as bad, all other cooperation were ranked average. Public organisations ranked all other cooperation as average as well. On national level all organisations ranked nearly all their experience with cooperation as bad, only NGOs ranked their experience in cooperation with universities, public organisations and other NGOs as average, only cooperation with companies are ranked as bad. On international level nearly all experience with cooperation are ranked as bad or even very bad, only universities had average experiences in cooperation with other universities or public organisations. By comparing expectations with experiences on regional level: there is one gap at this level regarding the cooperation between NGOs and companies, there is also a small gap with cooperation between public organisations. On national level there are several gaps according cooperation on national level.

Cooperation from universities with other universities show a big gap; cooperation between NGOs and companies show a gap as well as cooperation between public organisations. There are no big gaps according cooperation on international level.

## **2.7. Västerbotten**

### **2.7.1. Good practices: Sustainable Energy and Environmental Technology**

Increased use of forest biomass can contribute significantly to meeting EU and Swedish climate and energy targets. Increased use of bioenergy was the most important factor enabling Sweden to reduce CO<sub>2</sub> emissions between 1990 and 2014 by 25% while increasing GDP by 60%.<sup>1</sup> In this period, bioenergy use doubled.

Currently, several of the largest investments in modern history are being made in the forestry industry of northern Sweden. There are four universities, research centres, and clusters of leading-edge competencies and research in bioenergy. There is significant interest and potential for investment in northern Sweden regarding R&D in advanced biofuels. However, progress is slow due in part to conflicting signals from Brussels on the future role of bioenergy, creating market uncertainty. For northern Sweden to fully exploit our potential, we need to create more synergies and partnership opportunities in the EU to support sustainable research, develop new products and methods to create new jobs, new innovations, and a Europe that benefits sustainable development. For this to be possible, EU regulatory market frameworks must be certain and long-term, especially to facilitate necessary investment in innovative technology.

In Västerbotten we have a stable innovation system and cooperation through the Qudrophelix.

#### **Bioendev: Company driven together with university**

Bioendev is an innovative technology development company founded by Professor Anders Nordin and Doctor Ingemar Lindh in 2007. The company develop and supply torrefaction technology for production of black pellets, that enables the most cost-effective use of biomass in heat and power generation.

Based on over ten years of cooperation with the Universities in Västerbotten, Bioendev provide the world with a smarter substitution for fossil fuels and today the company have more than ten patents. One of the company's keys to success is creating an opportunity for sustainable change with low thresholds that is easy to adapt.

Combined with an effective value chain and low investments costs, the Bioendev technology provide owners of fossil coal plants and builders of plants an alternative to coal that significantly reducing their carbon footprint. Bioendevs industrial demonstration unit with 16 kton annual capacity was commissioned in 2016 and is now up and running. We also offer conversion of white pellets plants to torrefaction.

### **The Cluster of Forest Technology**

Increasing competitiveness through technological development is the guiding principle of Skogstekniska klustret (The Cluster of Forest Technology). The supply of skills, industrial research and collaboration between business, society and the economy are the key task of the work. The cluster consists of 10 companies in northern Sweden.

The members of Skogstekniska klustret are located in northern Sweden and consist of forestry machinery and direct-supply component manufacturers. The guiding principles for the cluster are to be business-driven, innovative and non-bureaucratic.

The companies in the cluster employ 1,100 people. Hence, the cluster accounts for half of the jobs provided by forestry technology companies in Sweden. The cluster companies also engage around 1,000 subcontractors from other industries.

### **A successful example of cluster formation**

In Sweden, cooperation between contractors, researchers, manufacturers and forestry companies has led to Sweden occupying a leading position in the world market.

A recent survey of the Swedish forestry machinery industry emphasises that all parties must work together to bring new products to market. Innovations and ideas grow best in smaller companies and structures. However, they then need an infrastructure for developing products, as transforming a concept to a finished product can be a tortuous process.

Innovation is massively enhanced when users, researchers, manufacturers and forestry companies interact in a productive environment. Skogstekniska klustret provides such an environment.

### **Projects, research and development**

The cluster is currently running more than 20 projects with a view to driving forestry technological development and creating ideal conditions for acquiring key skills.

The projects can be implemented thanks to co-funding, mainly from the EU's Regional fund and the Swedish Innovation Agency, VINNOVA. County councils and municipalities are also involved in financing. In-house funding of projects is possible through a significant financial commitment from the



Swedish state forestry company; Sveaskog and private forest owners; Holmen skog and SCA skog. In addition, the member companies contribute their own time, personnel and resources.

No direct compensation is paid to the companies for their contributions to development projects and test beds, but they receive other potent benefits from the cluster in the form of competitive advantage. Sveaskog, Holmen skog and SCA uses their commitments to promote systems development and thinking, thereby boosting profitability and productivity in the industry.

In the “R&D for systems development” project, the cluster has created innovative environments for linking research and business. This increases the industry’s ability to absorb research findings, and reduces lead times for new systems solutions, innovations and products.

### **Swedish Regions for a bioeconomy - NGO and public institutions**

The network today includes 14 of Sweden's regions with the goal of creating regional cooperation in the area of bioeconomy, which in turn will result in more bioeconomic investments in Sweden's regions. In the long term, it will generate greater opportunities for Sweden to achieve set climate and renewability goals.

Through increased political focus on reducing the climate impact and the use of fossil raw materials, sustainable use of bio-based natural resources has become a high priority issue and increasing demands on policy making. The network was initiated to strengthen the regions' and the general public's knowledge of bioeconomics in order to enable the regions to carry out regional development work that strengthens the industries concerned. Through the increased focus on bioeconomics in the policy processes collaboration, the regions become stronger and are given more opportunity to influence the political processes that are going on in the EU and in Sweden. Together have the network made common initiative to lobby the politician, events to gather strengthen cooperation companies, university, public sector and citizen. The network has been the first in the world with regional statistics for bioeconomy.

#### *2.7.1.1 The good practice story*

### **Why bioeconomy?**

Growth in the bioeconomy needs to be largely based on specific regional conditions. Through sustainable use of bioresources, EU regions can help solve global challenges such as a growing population, over-exploitation of resources, environmental pollution and climate change. The potential of Swedish regions to contribute to the bioeconomy needs greater emphasis.

### **The forest is important for Sweden and for EU**

The forest industry is one of Sweden's most important export sectors with great significance for the international trade in forest products such as pulp, paper and sawn timber. About 70 percent of Swedish exports of forest products goes to other EU countries. This means that there is a mutual dependency between the Swedish forest sector and the EU, which indicates the importance of finding forms to promote the continued positive development of the Swedish forest sector. It is therefore important to find ways to promote its continued positive development Swedish forest sector. Both for Sweden, which is a small, open and export-dependent economy, but also for the EU, which is a large importer of Swedish forest products.

The EU has high ambitions for climate and environmental work where the forest and bioeconomy are important for the circular economy of the future. To make it possible to achieve regional, national and European sustainable economic development, regions development must be placed in a wider context as well as development work (including legislation) at both national and EU level must be placed in a regional context.

In this light the Bioeconomy network started to take its form. The seed for the network was sown when the European Bioeconomy Panel started 2015. There, EU representatives stressed the importance of setting up national and regional networks.

- We have now done so and are proud to showcase what we do, says Magnus Matisons, project manager for Bioeconomic - regions in collaboration.

Region Västerbotten together with BioFuel Region (a NGO for 4 northern regions in Sweden) and region Värmland took the initiative for the project to better support the bioeconomic development in Sweden's Regions. By strengthening regional development in this area, the regions also contribute better to Sweden's climate policy goals. Regions in collaboration are a bioeconomic network for Sweden's regions. The network exists to develop and facilitate the regions' work on bioeconomy, but also to influence policy both nationally and at EU level.

### **How can we better support a bioeconomy, i.e. an economy where production is more bio-based and circular?**

Common to all regions is the need for regional strategies, such as food security and forestry. Here, the national food strategy has already been strengthened through collaboration with more regions are those included in the network. Next in turn is the forest strategy. This is something that all regions in Sweden benefit from. Regions are developing strategies for both developing the food industry and the forest industry in Västerbotten and the idea is that strategy work should contribute to accelerating development. We have a responsibility for future generations to help provide us with sustainable forest and soil products. The network has been able to join forces and connect actors to exchange valuable

lessons learned in the region. By fiscal meetings they have been able to get better insights what is needed for developing the bioeconomy in the regions but also the opportunity to meet with national and EU policy developer to get new insights and better monitoring the process. The structure for the meetings is to have one part internal and the other part is to invite key actors for bioeconomy.

### **Better results through collaboration**

Decisions that promote development of the bioeconomy require knowledge of each region's potential. This knowledge exists but must be communicated both in Sweden at large and throughout the EU. Many of Sweden's regions are already monitoring bioeconomic policies and stimulating development locally. The bioeconomy network can increase the effectiveness considerably through collaboration. Current issues in the EU, such as upcoming regulations affecting how forests and other bio resources can be used, are something regions and bio-actors need to pay more attention to. Collaboration is also important for developing regional food strategies.

The network has now compiled regional bioeconomy statistics for all of Sweden's regions. This is to give the regions better tools to support and develop their bioeconomy based on their specific conditions. The aim is to lay the foundation for a new national standard and to continuously make comparable analyses. The tool has been launched and is a good example of the results of the collaboration that has already received a lot of national attention and in Europe.

From the first meeting in 2017 a lot of joint activities has been carried out. The bioeconomy network have through it's collaboration been successful gathering actors, knowledge sharing.

The bioregions network success factors:

- strengthen regional and public awareness of the bioeconomy as a way to support regional development efforts and thus strengthen relevant industries.
- through collaboration, been heard and participate in the political processes underway in both Sweden and the EU.
- helped Swedish companies within the bioeconomy to achieve greater potential for continued profitability, a faster pace of innovation and increased investments.
- First in the world with regional statistics for bioeconomy
- The regions' work on bioeconomy is set as a good example in Brussels where the EC wants more regions to work in a similar way
- The network with collaborative regions have come to be an obvious interlocutor for bioeconomic processes both in the EU and at national level

### **Important activities**

October 23-24, Bioeconomic Day, Gothenburg (Leading organizations, key individuals and decision makers from both companies and academia and the public to drive bioeconomic development forward)

2019-01-30 First in the world with regional statistics for bioeconomy

2018-11-28 The regions work on bioeconomy is set as a good example in Brussels

2018-08-16 Debate with key actors in the bioeconomy: Fossil freedom - with or without palm oil?

2017-11-23 Positive feedback in Brussels when presenting the network for the EU expert panel

2017-11-15 Bioeconomic network meeting with EU-policy makers in Brussels

2017-09-14 11 regions come together for a fossil-free Sweden

#### *2.7.1.2 What contributes to regional connectivity?*

In Västerbotten we have dominant actors that have their own R&D units, and the smaller SMEs can be lost in the process. Therefore, it is interesting to learn how the public organisations act as intermediaries to connect companies with little or no R&D capacity with universities or other research and science institutions to push innovations in the FORREGION project in Oppland. Also, it is interesting how the public organisations have set up the grants due to the experience from Sweden that the grants it's difficult in practise due to state aid rules.

The Industry 4 Panevėžys approach to NGOs to facilitate meetings where experts from various fields discuss and present important regional trends was very interesting creating a knowledge sharing. To strengthen collaboration between different stakeholder to foster the innovative ideas generation, knowledge sharing and ensure the continuous flow of the investment in the region was seen as interesting.

University of Vaasa initiative to provide a platform and to lower the boundaries though the contact point was seen as a good approach to better connect regional stakeholders. Often the researcher and companies don't have a common meeting point where they can meet to discuss the vision and the development of the regions

#### *2.7.1.3 Which regional or national factors enable the achievement?*

In all three examples of good praxis that Västerbotten has identified, the regional actors have together joint forces for development. Through this place-based approach that targets an entire community and aims to address issues that exist at the regional level that leads to gaps a joint approach can avoid duplication of effort, create critical mass and a vision to create economic opportunities.

#### *2.7.1.4 What factors that can lead to failure of implementing this good practice in other regions?*

- Vague definition about the bioeconomy definition – the bioeconomy goes into various political areas and if the network has not a common understanding of the definition it can be too wide risking the network doing everything and achieving nothing.
- Too high expectations – Expectations are unavoidable and will impact upon projects in various ways. Proactively managing expectations leads to successful projects, satisfied stakeholders, and engaged teams. This involves addressing expectations during project planning and execution, frequent communication, and a focus on realistic goals
- Red tape – it can be difficult with the administrative hinders for setting up the consortia and project partners have different administrative routines.
- Joint positions without a message - taking joint positions is a strength but must be balanced so the message is not watered down to please everyone
- No political support – if the sustainable development is not a priority for the region/nation the development can go slow and the partnership can lose the momentum
- Not enough resources

#### *2.7.1.5 What factors that can lead to success of implementing this good practice in other regions?*

- Drivers that have the have a good network and can facilitate the coordination of the actors
- Strengthen regional and public knowledge of the bioeconomy to support regional development efforts and thus strengthen relevant industries.
- Matchmaking – different actors can meet to create a common language for bioeconomy and exchange knowledge
- Efficient use of resources by build a knowledge bank for bioeconomy that can be used by all the actors
- Strengthen collaboration and connectivity between actors in the bioeconomy sector,
- Through collaboration build larger investment that can't be achieved in isolation
- Be visible, heard and participate in the political processes at national and the EU to contribute to future policy that benefit the regions
- help companies within the bioeconomy to achieve greater potential for continued profitability, a faster pace of innovation and increased investments.

#### *2.7.1.6 In what degree the achievement is possible in the context of the other region?*

The Swedish Regions for a bioeconomy was picked as the good practise due to its transferability and the added value for the whole BSR to strengthen the bio actors' collaboration and was defined in the collaboration between NGO and public institution was defined as a gap for all the partners in the LARS-project.

By a strong commitment and anchoring of common goals for the network, the transformation is relatively simple. It is important to locate key actors that are willing to be leaders / drivers. The facilitator should have a large network to be able to connect different actors and handle the contacts with etc. Managing authorities so the process can go smoother to find financing. By being inclusive but also having strong leadership, activities can be planned that add value and gather capacity for the regional development.

### **2.7.2. Gaps**

Västerbotten is performing well in the Gap-analyses overall but there are also areas that could be improved, such as

- Companies (regional, national and international) cooperation with public organizations regarding regional development;
- Cooperation between NGOs on regional development (regionally and nationally) as well as cooperation in between them on development of service/products (nationally and internationally).
- In addition, impediments to cooperation between companies and universities could be noted in relation to education, research and development (internationally);
- Public organizations' future ventures with companies (regionally) also appear to face hurdles as well as NGO's future ventures with public organizations (regional and international);
- There also appears to be obstacles in the cooperation between public organizations (nationally) on innovation networks. Thus, there could be further improvements.

Sustainable energy and environmental technology companies in Västerbotten have good connections to universities and even consider them to be more important innovation partners than other companies. This can be explained by our three Universities in the region.

Companies are more internationally oriented than actors in other helices and their international contacts are the route to connect the cluster globally. Companies have gaps towards public organisations regarding collaboration in regional development and have also gaps in their relations to international universities, due to high expectations. Some of these issues were noticed to relate to time issues as well as living in “different worlds” to some point.

Universities in the region have no major gaps and are mostly cooperating with regional partners, with the exception of national public organisations, which were more important than regional public organisations. Universities seem to be very important partners to regional companies.

Public organisations are overall strong regarding their power, legitimacy and urgency, but actors in other helices consider national and international level public organisations to be more important than regional public organisations. One exception is NGOs, which do not consider international public organisations to be more important than regional ones. Public organisations have some gaps regarding future ventures with regional companies, as well as with national public organisations regarding innovation networks.

NGOs are not considered to be very important innovation partners by other helices. However, NGOs consider actors in other helices at regional and national level to be important partners for them, Universities and public organisations are the most important partners for NGOs. Most of the gaps are related to cooperation with other NGOs in regional or product/service development. There is also one positive gap between NGOs and international NGOs regarding future ventures.

Regional				National				International			
-0,53			0,8	0,87			0,40	1,13			0,40
Companies	-0,13	0,53	Universities	Companies	0,40	0,20	Universities	Companies	1,80	0,13	Universities
0,60	-0,40	0,93	0,00	1,07	-0,47	0,27	0,00	1,47	0,07	0,53	0,00
0,83	0,58	-0,11	0,22	0,58	0,58	-0,11	-0,11	0,83	0,17	-0,56	1,00
Public organisations	0,17	0,67	NGOs	Public organisations	-0,17	0,56	NGOs	Public organisations	0,00	0,89	NGOs
0,92			1,56	1,17			1,78	0,58			0,00

## 2.8. Energy technology cluster in Ostrobothnia

### 2.8.1. Good practice: InoLab

Based on stakeholder interviews (collaboration regarding the good practises were mentioned in some of the interviews) and discussion among the project team members in Ostrobothnia, we were able to identify 4 good practises: University platforms, Digitalisation Academy, Connectivity analysis and

introductory videos. These presented different good practises from different helices; universities, companies, public organisations and NGOs.

When deciding among the four practises, which was chosen as a suggestion to be presented in learning seminar, we chose university platforms, because we felt that they were the most original solution to problems and connectivity analysis was already in effect in the partner regions (used in LARS). Emphasis was put on the transferability of the good practise, as platforms could be organised by anyone, not just universities and they were, by nature, not tied to a specific industry and therefore could be applied anywhere.

During the learning seminar, the stakeholders recognised the good practise and considered it a good solution to transfer. They also mentioned about similar activity, Wärtsilä's Smart Technology Hub, which is company driven innovation platform. However, we did not choose this one, because it is not open for everyone, but is based on partner-agreements and it also has not been properly established yet.

#### *2.8.1.1 The good practice story*

It is difficult to say some certain starting point for the development of platforms, as Ostrobothnia has had a good collaboration happening for several years and especially regarding its energy technology cluster. Even when University of Vaasa was just a business school, the role of technology was acknowledged in the region and this lead to the establishment of Technobothnia technology research centre in 1996. In Technobothnia the regional universities combined their resources with willing companies and were given the latest tools from the field. This also helped the companies, as they received workers, which already knew the companies' equipment very well. Companies also were able to use the facilities to show their products to their customers and this arrangement was very beneficial for all parties. Originally, University of Vaasa was lacking faculty for technical studies and technology was taught mostly in local universities of applied sciences. Eventually and thanks to the pressure from local companies and policymakers, University of Vaasa was able to receive rights to issue master's degrees in technology after 2004 and technology became integral part of university teaching. Therefore, it could be said that history of co-operation paved the way for new establishment and allowed to initiate new issues There was built-in trust between local companies and the university.

Pressure from society has since then increased even more and new development ideas have emerged. On the other hand research field has changed, as societal challenges have pushed universities towards more "hands-on" approach and cuts from basic funding has forced universities to apply for more external funding, which is linked to the aims and wishes of the funding associations. This has slowly but surely led to increasing consideration of "customer experience" and thus more practical



approaches from universities overall. As local companies have become more accustomed to the researchers, they also understand better, what can be accomplished together and who to approach with ideas. This has earlier been possible only for the biggest companies who have been able to have mutual dialogue with the university thanks to their long history together. Companies' needs have been directing the research alongside the wider claims from society.

Research field has also changed as researchers have seen that phenomena-based and multi-disciplinary research opens new avenues for research. The times of doing research alone have changed into international networking and wide research consortiums. Of course, funding instruments have also guided the researchers for establishing these networks. In addition to the changes of mind set, new ideas for collaboration have also emerged. One of the ideas has been a platform, which is organised on a specific theme and often have an organisation, which is establishing as well as promoting the topics.

At the University of Vaasa the idea of establishing platforms to aid in organising and opening up research for the whole society was probably due to several incidents which occurred at the same time; i.e. a window of opportunity. First, the newly elected vice rector of the university in 2015 and current rector, Jari Kuusisto was an innovation researcher, who has worked in MIT (Massachusetts institute of technology), where platform-concept has been previously utilised. Second, the Finnish Ministry of Education asked all universities for more strategic research focus. Because of the decreasing state budget for higher education cuts had to be made in the university sector. The University of Vaasa i decided to transfer language studies to the University of Jyväskylä and based on this, the University of Vaasa received strategy funding from national budget. University board then decided that they would use this funding to establish new type of research platform, based on the idea of phenomena based, multi-disciplinary and open approach to research. It was natural to test platform idea with energy technology focus, especially as local companies were keen to participate on this new arrangement.

First of the platforms was called VEBIC (Vaasa Energy Business Innovation Centre) and a motor engine and fuel laboratory was built in order to establish a platform in the university campus area in 2016. After this first visible establishment and collaboration, university decided to found more thematic platforms. Idea was to establish platforms, which might encourage the whole university into wider collaboration with surrounding society. After some discussion with university professors and leaders, the idea of focusing on digitalisation and innovation emerged and this was transformed into Digital Economy and Innolab -platforms. Digital Economy platform was response to the societal challenge of digitalisation. It focuses on new technology like artificial intelligence and machine learning, and digitalisation as well as their impact on individuals, organisations and society. Innolab platform focus on open and user innovation, entrepreneurship, and public sector innovation and renewal. InnoLab also encourages the application of citizen science, open science, and design thinking. The goal of InnoLab is to create

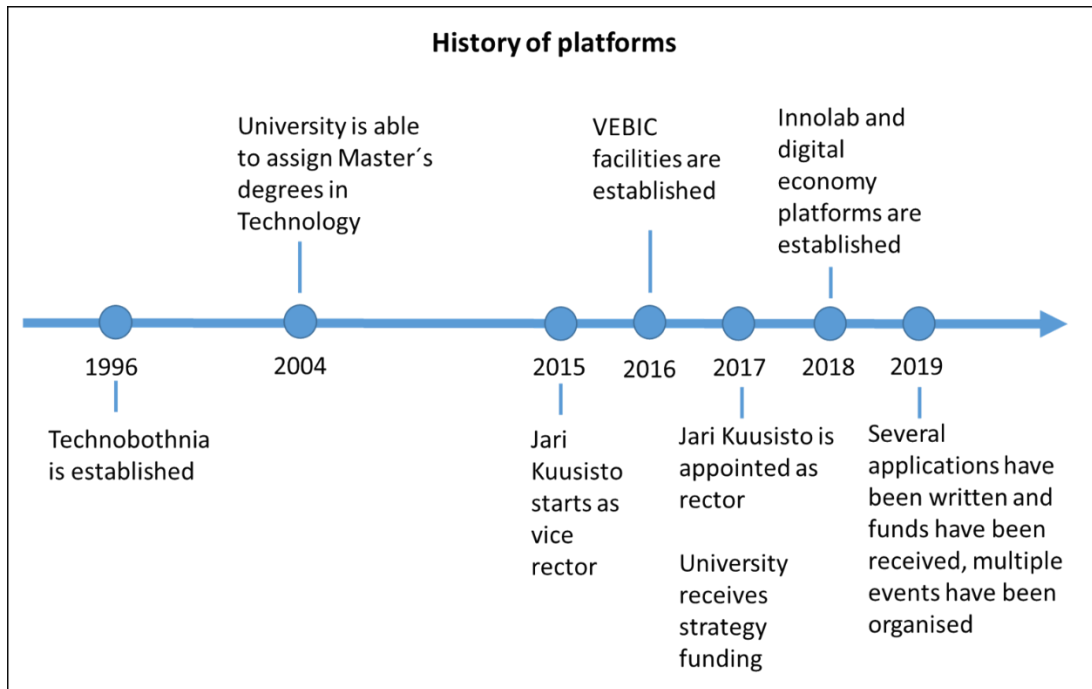
innovative and unique research and to promote new ways of doing science. The combining factors on the background are inclusion, creativity, reduced hierarchies, and active citizens.

In 2018 the two other platform leaders and several thematically related tenure-track researchers were hired. The former secretary of VEBIC started working as mutual secretary for all platforms. The platform leaders work only for the platform, and their salary is paid by the university. Tenure-track researchers are working 50% for the platforms and 50% for the Schools of university, so they are partly part of these “organisations without walls” and partly part of more regular teaching and research activities. However, platforms are expected to gain external funding and this means that researchers who are partly working for platforms are constantly applying funding for the platforms. Their salary comes from university, but continuation of the tenure is tied to performance indicators, which means that tenure-track researchers need to be able to gain funding if they wish to continue their work.

All of the platforms have been active collaborators in the region, they have organised many event, and they are well known in the region. Several research applications have been written and they are opening up the university towards society. Platforms collaborate especially with the companies of the energy technology cluster, which is widened into new themes and thus to wider society.

#### **Brief summary of the good practise:**

- The starting point
  - There was a history, which was backing things up, when window of opportunity arrived
- The heroes and helpers
  - local companies and related university researchers established the collaboration, which was a good starting point for the rector and the university board.
- Timeline, tasks and resources
  - timeline is hard to define, as some sort of history of collaboration is in the very least, helping in establishing the platforms. After establishing the platforms, it took around 1 year before they had leaders and started operating as they currently are. Some time is needed to allow the leaders to become accustomed to their theme and possible actors which are linked to it.



-Main task of the platform leader is to connect the different research fields at the university, as well as connect the university researcher into wider society. Then he/she also needs to use these contacts and turn them into external funding for the university. In this work it is useful to have some platform team members, which add experts in writing applications, otherwise the platform leader is busy doing either or but not both at the same time.

-Resources need to be quite high for hiring the platform leaders and recruiting staff, but one is also probably able to add staff gradually, as has been done in University of Vaasa. Theoretically the platform leader might be hired to start things off, especially if his/her performance is evaluated by the funding, that she receives. In this case one year is required for him/her to make contacts beforehand, as it is impossible to do for a complete outsider. There needs to be time for networking before applying for funds.

- Challenges and difficulties on the way

-biggest gaps and challenges were probably happening inside the university, as the role of the platforms was not clear in the beginning of the process. Many researchers were reluctant to collaborate with the platform, as many had already established research networks, which they favoured over the "newcomer". It was unclear whether one had to collaborate with platforms and some people thought that this would be the end of the freedom of research. Also, the deans of schools, as well as, unit leaders and professors did not like that platforms were recruiting people to write applications, as the platforms did not pay for this contribution and thus were utilising their staff for the platforms purposes.

How to bridge the gaps

-University made it more clear how the platforms work and highlighted that staff can freely choose to collaborate with the platforms or not. Tenure tracks' role was clearly defined to the 50/50% mix so that they also contribute to university basic research and teaching contribution; as this is generally seen as important skill to have as a researcher.

-Platforms have gained funding and are constantly applying for more together with those researchers who want to be involved. Platform leaders are well known and this hopefully helps in contacting the University for more mutual projects, also in the future.

#### *2.8.1.2 What factors that can lead to failure of implementing this good practice in other regions?*

Platforms require right people and support from the organization, which governs them. At the university of Vaasa, the platforms have developed through long term-activities, pressures from the society and by the support of the rector. This pressure to act and possibility to test the platforms with open – minded stakeholders has been important in their establishment. Also the platform leaders need to be good communicators and connectors; either by making connections and building networks easily, or by having vast amount of connections already. If this model is applied in public sector, there is a challenge to appease different political parties etc. It also might be difficult for public organization to participate in the innovation network. For public sector, this is especially challenging, as they need to take central stage, when other societal actors do not necessarily very well know them. Company-driven platforms may also suffer from the possible bias towards the organizing company, as they have a more central role than some other partners do and this may hindrance the will to cooperate with such an actor. NGOs might be good platform organizers, but they may not be well known or lack resources to make the platform known enough. It is possible that platforms will fail, if collaboration culture is not strong enough. Platforms also need visibility; otherwise, they do not reach different stakeholders, which limits their potential. Interestingly, all of the mutually determined challenges apply to this good practice, such as:

- Lack of trust
- Lack of partners and cooperation
- Different Cultures
- Insufficient communication
- No common goal
- Backward-looking view

### *2.8.1.3 What factors that can lead to success of implementing this good practice in other regions?*

Platform is both a symbol as well as a tool for enhancing collaboration. Platform is a message of willingness to change and discuss. This requires that there is some form of mind-set, which favours collaboration or at the bare minimum; change. It also requires resources in at least one person, who is able to contact different types of people. This cannot happen without wide support and this needs a powerful organisation, which is officially governing the platform leader. Resources and mental support are needed from the “parenting” organisation in order for this to happen. It also requires interested stakeholders, who welcome this new attempt to open sectoral borders and who are curious enough to try some mutual collaboration. This willingness to cooperate might happen through participating in mutual events or by visiting the local actors and thus letting them know that the platform is there for them. It is important to participate in different activities thorough the society. Interestingly, all of the mutually determined success factors apply to this good practice, such as:

- Having the “right” persons in the right place
- Support for persons to become the “right” persons
- Drivers with high power and legitimacy
- Common goal
- Resources
- Identification, explanation and bridging of gaps
- Learn from others
- Trustful and open communication

### *2.2.1.4 In what degree the achievement is possible in the context of the other region?*

Stakeholders were positive towards the identified good practice and felt that it is transferrable to other regions. They also highlighted that some adjustments are probably needed in order to make it work in other regions and industries.

## **2.2.2. Gaps**

Ostrobothnian innovation can be considered company driven. Biggest gaps were on regional and national level, between public organisations towards companies, as well as public organisations towards universities. Some major gaps also existed between NGOs toward universities on regional level and

between public-public collaboration on national level. On international level the biggest gaps were NGOs towards universities.

Out of these gaps, the project team members decided to focus on the biggest gaps on regional level, since this geographical level can be considered to be most important (biggest expectations and experiences overall, when compared to national or international level). Out of the three biggest gaps (public-company (1, 93), public-uni (2, 13), NGO-uni (1, 89)) focus was given on public sector collaboration, since it clearly has challenges regarding collaboration with two other helices. This meant that focus was given on public collaboration overall.

The biggest collaboration issues were identified based on stakeholder interviews done during WP3. These were presented instead of concrete gaps in the learning seminar. However, it was mentioned that gaps could also be looked upon in the meeting, if anybody would be interested to see them, which wasn't the case. The three challenges were identified and presented as:

- strategic collaboration of public organisations with companies and universities
- student engagement in public organisations
- SME participation in development and talent shortage

Strategic collaboration was found lacking in the region and means that companies and universities do not inform public organisations enough about their long-term plans. Even though it is understandable that companies cannot share all their business secrets, there still should be some form of communication between the helices regarding strategic development issues. It is difficult for public organisations to develop the region if they do not know what is happening within it.

Student-based engagement is really working well in the region, inside companies. They are able to constantly gain new talent from students and even apply this help strategically, where individual thesis and project work is coordinated in order to develop larger entities. Public organisations, on the other hand, really lack this capability and have not been able to utilise students in their development work in such comprehensive manner.

SME participation was also clearly present in the collaboration between public organisations and between universities. SMEs are not simply present enough in order to get their voice heard and this creates situation, where larger companies are only heard off. SMEs also suffer from talent loss, since they are not that well known, which creates a situation, where students and researchers look more towards collaborating with larger companies.

The biggest challenges were also presented in learning seminar and stakeholders considered them to be relevant for the region to focus upon. Discussion was focusing on talent shortage and student utilisation in particular. It was considered crucial that region is able to obtain international students and

should help in training of new talent. Lifelong learning was mentioned as one important issue to look upon in order to keep the region competitive in the future.

### 3. Reports on Transnational Learning Seminars

The following table lists the Transnational Learning Seminars, their dates, where they took place and information about the stakeholders that attended them.

Region	Date	Stakeholders	
Päijät-Häme, Finland	August 28 <sup>th</sup> 2019	12	
Lithuania (LIC)	26 <sup>th</sup> September and 21 <sup>st</sup> November 2019	More than 30	
Latvia	16 <sup>th</sup> October 2019	5	<ul style="list-style-type: none"> <li>• MoEPRD</li> <li>• Employers' Confederation of Latvia (LDDK)</li> <li>• Vidzeme planning region (regional level actor)</li> <li>• Ministry of Economics</li> <li>• Ministry of Education and Science</li> </ul>
Lithuania (LAEI)	14 <sup>th</sup> November 2019	20	
Västerbotten, Sweden	26 <sup>th</sup> November 2019	8	
Hamburg, Germany	27 <sup>th</sup> November 2019	3	
Oppland, Norway	15 <sup>th</sup> December 2019	6	

*Table 2 LARS Transnational Learning Seminars*

### 3.1. Identified matches

#### 3.1.1 Päijät-Häme

##### 3.1.1.1 Vision

Päijät-Häme's vision isn't clear yet. It should be created in close collaboration with all members. Grain cluster companies are the main actors to create the vision and define goals how to be a part global value chain. Coordinating organisation, Regional Development Company, and RC Päijät-Häme have planned to make a questionnaire concerning Grain cluster future expectations and vision. Regional Council just started a process to update the regional strategy of smart specialisation. Process is planned with 4helix actors and it will give common goals for our Regional Innovation Strategy.

An enlightened guess on the vision could be "The world's most innovative grain cluster and ecosystem".

### *3.1.1.2 Good practices that can be used for overcoming the gaps in the region*

Some good practices for bridging gaps between companies and universities.

#### **InoLab – Ostrobothnia**

University of Vaasa initiated different platforms to lower boundaries for companies, NGOs and public authorities to get in contact with universities (open-door policy). It offers wide research networks with experts from different fields. The platform leaders act as contact points and constantly search for options/institutions where scientific research might be needed outside university. This good practice is based on good relations among helixes' actors, and thus might become powerful to close the gap between companies and universities, since it has evident strengths like:

- ✓ new discoveries can often be found through the combination of different mind-sets and disciplines (cross-sectoral approach);
- ✓ lowers the organisational barriers and opens doors for wider society;
- ✓ the platforms allow for implementing the open-science concept, a rising trend in the global research field.

It is good practice to learn from and the timing is perfect because of fusion of Lappeenranta University and Lahti University of Applied sciences. Lappeenranta University has its own research platforms and it would be interesting to compare differences and confluences of these platforms. Open platform might provide more especially for SME's than pure scientific research platform.

#### **Industry 4 Panevėžys – Lithuania (LIC)**

Good practise is an initiative that incorporates different activities aimed at the development of the Industry 4.0 in the region of Panevėžys. Päijät-Häme region is interested in the composition and organisation of the working group, as well as the method used for the engagement of the most important



regional actors for constructive discussion. There is also learning potential in relation to how start the transformation of the regional strategy in whole innovation ecosystem: starting from primary schools and informal learning and continuing with the R&D institutions that develops solutions for local companies.

Päijät-Häme Grain Cluster and Mechatronic Cluster are interested in developing their actions and visions for the future. Both clusters operating model are based on free will, but they are considering more formal model for several reasons like joint development projects and applying funding.

### **3.1.2 Oppland**

#### *3.1.2.1 Vision*

An enlightened guess on the vision could be “Adventurous opportunities”.

#### *3.1.2.2 Good practices that can be used for overcoming the gaps in the region*

##### **InoLab – Ostrobothnia**

Establish platforms to lower boundaries for companies, NGOs, authorities and civil society to get in contact with universities (open-door policy)

##### **Industry 4 Panevėžys – Lithuania (LIC)**

Establish a platform where experts from various fields discuss and present important regional trends. To help regions and sub-regions to transform and be more innovative with basis in their strengths

##### **Cluster of Forest Technology - Västerbotten**

The Cluster of Forest Technology. Increasing competitiveness through technological development - supply of skills, industrial research and collaboration between business, society and the economy. In Oppland we are struggling a bit with establishing a strong cluster for the wood value chain. Hopefully we can get some good practise to solve this from Västerbotten.

### 3.1.3 Lithuania (LIC)

#### 3.1.3.1 Vision

The main goal in Panevezys County is to ensure the development of the highly competitive value-added Industry 4.0 ecosystem that would rely on the close collaboration between business, education, science and public sector representatives. In regards to this vision LIC will cooperate with regional stakeholders to initiate, strengthen and consolidate the collaboration between different stakeholders, including business, education, science and public sector representatives in order to foster the innovative ideas generation, knowledge sharing and ensure the continuous flow of the investment in the region. Our goal is to contribute to the development of Panevėžys region as the innovative manufacturing centre.

#### 3.1.3.2 Good practices that can be used for overcoming the gaps in the region

LIC together with the main stakeholders identified 2 good practices that could be transferred into Lithuanian innovation ecosystem with an aim to close the existing gaps:

#### **Lahti Regional Development Company (LRDC) – Päijät-Häme**

Lahti Regional Development Company (Finland) could contribute to Panevezys County in establishing a new institution that would coordinate all relevant actors that should be involved in the development of advanced manufacturing value chain.

LRDC Develops the conditions for business growth and competitiveness in addition to marketing the region as an attractive business environment. LADEC is helping entrepreneurs and businesses in founding, growing, networking, developing and locating a business, in addition to internationalisation. Advisory services are free of charge. Activities are led by the board of directors that has its members from regional companies, municipalities, local authorities and universities. LADEC coordinates three local business networks that are based on developing business operations and joint marketing: the Maritime Cluster, Mechatronics Cluster and the Grain Cluster. LADEC advise companies on all types of things related to finance and funding, including:

- Planning development projects and investments, budgeting and obtaining the necessary funding.
- Planning and monitoring finances.
- Helping to find capital funding and venture capitalist

As it was mentioned in Lithuanian stakeholders meeting that Panevezys County needs some sort of coordinator between business, education and public authorities to get the answer that companies might

have regarding innovative partnership etc. Thus, the good practice identified in Lahti region could be a perfect guide what kind of services regional development agency might offer for regional actors.

Lahti Regional Development Company is the main coordinator in the region which works as a one-stop-shop for companies that want to cooperate with other actors and need any kind of support: from funding to internationalization issues. Päijät-Häme region is a good evidence how companies can initiate cross-sectoral collaboration projects, nevertheless those projects won't be possible if Lahtis Regional Development company would not exist, as it provides valuable contacts also important information about funding for innovation projects that could encourage the cooperation. This kind of actor that would coordinate all regional stakeholders is necessary for Panevezys County as the region is full of potential, however regional companies are not sure where they can get the information they need.

### **InoLab – Ostrobothnia**

Vassa initiated an interesting practice where university platforms offer their knowledge and services for innovative businesses. The platforms are cross-sectoral collaboration institutions designed to lower boundaries for contacting universities. Because of these platforms collaboration between business and universities is more visible and this creates more opportunities for both researchers and companies. When people know who studies and what, then they are more prone to contact the personnel. Platforms have gathered external funding, but are still at a very early stage (all personnel have not been recruited yet, etc.). However, platforms have already managed to develop two new forums for discussion (Space Economy Forum and Wasa Future Festival), which have gathered wide interest. The idea of an “institution without walls” is the key organizational feature, which is made into practice by being present and by utilizing both existing and new networks.

InoLab in Ostrobothnia (Finland) shows how open doors policy in Universities could create new networking opportunities for all innovation actors and spark new project ideas in the specific fields. By taking into account these learning Panevezys could establish more active relations between research institutions and entrepreneurs.

The university-driven good practice in Ostrobothnia shows that various actors should be open and dedicated to initiate collaboration among different helixes. The good practice indicates that one the main features of success is the willingness of universities to participate and some sort of willingness to do things together in the region. Otherwise works in any field, as platforms may have different themes. This practice suggests, that research institutes and universities (KTU, Mechatronic centre) should open their doors and initiate new activities that would attract business attention. As in Ostrobothnia collaboration has been improved mostly because of the publicity of the platforms and their experienced leaders, who

have wide networks. One might say that the idea of an “institution without walls” is the key organizational feature, which is made into practice by being present and by utilizing both existing and new networks.

### **3.1.4. Latvia**

#### *3.1.3.1 Vision*

Overall we can say that the vision for our region lies in the regional level. It is not so important which sector or field it will be but the most important thing we need to try to promote is – power a legitimacy of regional actors and stakeholders. It is clear that they have urgency but power and legitimacy are missing. So the chosen good practice should be used in new ideas and approaches how to strengthen the regional level.

#### *3.1.2.2 Good practices that can be used for overcoming the gaps in the region*

During transnational learning seminar with stakeholders, all good practices were presented but the chosen practice was discussed a little bit more detailed and with a focus on how this particular practice can be transferred to our region.

For the discussion to be more productive and framed, several questions were discussed – what activities promote the cooperation at the regional level? What activities lead to success? What leads to failure? Who should be the driver? From which other good practice can we learn from? What experience do we need? How to implement it our region?

Other regions offered such good practices which can bridge the gaps:

- The University of Vaasa – a platform for cooperation (gap: universities-companies);
- Oppland – contact point between entrepreneurs and scientists (gap: universities - all);
- Hamburg – the university as project promoter and implementer (gaps: universities – public organisations/NGOs; NGOs - companies);
- Paijat Hame — grain cluster (gaps: companies – regional universities; public organisations - companies);
- LIC – NGO led expert cooperation platform (gap: companies – public organisations);
- LloAE - Introduction of the principles of circular economy in school (gaps: NGOs - all);
- Vasterbotten – cooperation between regions (gap: public organisations - NGOs)

As the analysis in WP3, focus group meeting and transnational learning seminar showed, the gap which should be bridged at first in our region is the gap between companies and universities (including research organisation). So the good practice from all presented good practices to work further with should be chosen in the way that this practice could help to bridge gaps in our region.

As we can see the best match for our gaps are the examples of the University of Vaasa and Oppland because these practices can bridge our gaps. Despite the fact that in both good practices we can see useful elements for our region, in order to proceed further the best practice to choose is the University of Vaasa cooperation platforms.

### **3.1.5. Lithuania (LAEI)**

#### *3.1.5.1 Vision*

*Lithuanian is an open region with collaborating helixes for smart specialization in bioeconomy.* Lithuania has ambition to accelerate smart specialization in bioeconomy with particular focus of closing the gap in the field of isolated role of government institutions in smart specialization development. It aims to make Lithuanian government institutions (as key players) more open for collaboration regarding innovations with the rest of stakeholders.

#### *3.1.5.2 Good practices that can be used for overcoming the gaps in the region*

Good practices from other regions had been identified in two stages, taking into account:

- what area of intervention good practice belongs to;
- what actual examples seems to be promising for closing the observed gaps in Lithuania.

The two good practices were identified to be promising for closing the Lithuanian collaboration gap for innovation in bioeconomy:

#### **FORREGION – Oppland**

In the area of forest-based bioeconomy – with a focus on the value chain of wood constructions. Public institutions provide support (financial and knowledge) toward concrete needs and challenges for R&D of businesses, especially SMEs. They bring together scientific institutions and SMEs with the help of dedicated *competence brokers*. Despite the fact, those universities see big gaps towards all actors of the helix (company, NGO, public organisation) these gaps are too small to be taken into account in Lithuanian case. Thus this good practice was selected to learn from.

The observed strengths are related to the action of public organizations which is relevant to learn for Lithuanian institutions. Public organisations act as intermediaries to connect companies with little or no R&D capacity with universities or other research and science institutions to push innovations. Also public organisations can provide grants to foster the collaboration. It is a successful innovation as stakeholders (public institutions and universities) have high legitimacy.

### **InoLab – Ostrobothnia**

University of Vaasa initiated different platforms to lower boundaries for companies, NGOs, authorities and civil society to get in contact with universities (open-door policy). It offers wide research networks with experts from different fields. The platform leaders act as contact points and constantly search for options/institutions where scientific research might be needed outside university. This good practice is based on good relations among helixes' actors, and thus might become powerful to close the Lithuanian gap, since it has evident strengths:

- new discoveries can often be found through the combination of different mind-sets and disciplines (cross-sectoral approach);
- lowers the organisational barriers and opens doors for wider society;
- the platforms allow for implementing the open-science concept, a rising trend in the global research field.

It is good practice to learn from since it is a successful innovation - stakeholders (university) have high legitimacy and power. At the same time it requires willingness of universities to participate and collaborate in the region and outside the purely scientific field.

## **3.1.6. Hamburg**

### *3.1.6.1 Vision*

Instead of throwing materials 'away' to landfill or incineration, a new distributed system of resource management, nutrient flows, and reverse logistics makes the return, sorting, and reuse of electronic and electric equipment possible. Materials stay in use. The amount of waste and CO2 emissions are reduced.

A low-environmental-impact economy promotes new forms of production and consumption, as well as sociability, while opening up avenues for the creation of sustainable jobs.

Products are designed in value chains and maximal level of product transparency for reuse and multiple cycles. The contribution of the specific good practice to the regional connectivity (networking, knowledge brokers, institution etc.).

Universities, companies, public institutions and NGOs work together to support and to incentivize new business models and enable local material loops.

### *3.1.6.2 Good practices that can be used for overcoming the gaps in the region*

During the transnational learning seminar in Hamburg these chosen good practices were discussed with the stakeholders. We discussed also the gaps of these good practises the regional connectivity, enabling factors for this connectivity and in general the factors for failure and success.

The following table lists the good practise from other regions with examples how to bridge gaps in the innovation system in Hamburg. What is missing in Hamburg's innovation system is the commitment from companies. The main task for improving Hamburg's innovation system is to involve more companies. The analysis shows no big gaps in cooperation with companies. There are no big gaps because already the expectations from companies according to cooperation with other actors are rather low. Therefore bad experiences will not lead to big gaps, nevertheless companies' involvement in the innovation system and their cooperation with other actors are low. We choose good practise from other regions, where the involvement of companies is quite good and companies are drivers of innovation and very much motivated to cooperate.

<b>Good practice</b>	<b>How can this practice bridge gaps in Hamburg?</b>
Grain Cluster, Päijät Häme	This practice connects industry companies and universities, research institutes and NGOs, fostering circular economy for more efficient and innovative use of resources.
	Common goals lead to strong commitment of all actors
	Companies can engage seeing some short-term business advantages coming from joint the projects.
Metal industry, Lithuania	Business NGOs (acting as an intermediate) – associations, clusters – are providing a platform for cooperation.
	They offer knowledge and information sharing to interested stakeholders, especially companies

	Public organisations can work as a supporting actor, providing financial resources
Wood cluster, Oppland	Interaction between SME, bigger companies, public institutions and scientific institutions.
	Public institutions provide support (financial and knowledge) toward concrete needs and challenges for R&D of businesses, especially SMEs
	Public organisations act as intermediaries to connect companies with little or no R&D capacity with universities or other research and science institutions to push innovations
Energy cluster, Ostrobothnia	University platforms, which are cross-sectoral collaboration institutions designed to lower boundaries for contacting universities
	University leadership initiated a cross-sectoral research idea, which started the platforms
	How to engage the wider society and how to open doors for cross-sectoral collaboration

*Table 3 Hamburg matches*

### 3.1.7. Västerbotten

#### 3.1.7.1 Vision

Västerbotten has a vision to accelerate smart specialization in bioeconomy with focus of better connect the Quadrophelix to create sustainable innovations that are ready for the market.

#### 3.1.7.2 Good practices that can be used for overcoming the gaps in the region

#### **FORREGION – Oppland**

In the area of forest-based bioeconomy – with a focus on the value chain of wood constructions. Public institutions provide support (financial and knowledge) toward concrete needs and challenges for R&D of businesses, especially SMEs. They bring together scientific institutions and SMEs with the help of dedicated *competence brokers*. Despite the fact, those universities see big gaps towards all actors of the helix (company, NGO, public organisation) these gaps are small to in Västerbotten case. Thus, this good practice was selected to learn from as it is a straightforward approach to foster new R&D cooperation that is needed for the SMEs. In Västerbotten we have dominant actors that have their own R&D unites, and the smaller SMEs can be lost in the process.



Therefore, it is interesting to learn how the public organisations act as intermediaries to connect companies with little or no R&D capacity with universities or other research and science institutions to push innovations. Also, it is interesting how the public organisations have set up the grants due to the experience from Sweden that the grants it's difficult in practise due to state aid rules.

#### **Industry 4 Panevėžys – Lithuania (LIC)**

Industry 4 Panevėžys is an initiative that incorporates different activities aimed at the development of the Industry 4.0 in the region of Panevėžys. It's interesting for Västerbotten to see how the initiate, strengthen and consolidate the collaboration between different stakeholders, including business, education, science and public sector representatives in order to foster the innovative ideas generation, knowledge sharing and ensure the continuous flow of the investment in the region.

Companies and the public sector were one of the gaps that was lifted as an important gap at the transnational seminar and the Industry 4 Panevėžys approach to NGOs created a new platform where experts from various fields discuss and present important regional trends was seen as very interesting.

#### **InoLab – Ostrobothnia**

University of Vaasa initiated different platforms to lower boundaries for companies, NGOs, authorities and civil society to get in contact with universities. Västerbotten stakeholder saw the approach of the University as contact points and constantly search for options/institutions where scientific research might be needed outside university as a good initiative to help Västerbotten to lower the gaps between companies and Universities in the regions (an is the significant biggest gap in the analysis for Västerbotten).

### **3.8. Ostrobothnia**

#### *3.1.8.1 Vision*

Stakeholders had no interest to define a vision for the region, as this has been done in regional strategy document. Ostrobothnia's current vision is: "Ostrobothnia of New Energy: Energy from talent, multiculturalism and communality".

### *3.1.7.2 Good practices that can be used for overcoming the gaps in the region*

Good practises were introduced in the learning seminar one by one as follows: Ostrobothnia (University platforms), Oppland (FORREGION), Päijät-Häme (Grain Cluster), Hamburg (FORCE), LIC (Panevezys 4.0), Latvia (MASOC), LIAE (Biogas), Västerbotten (Bioeconomy-network initiative). They were organised in three broader categories: New ways of collaboration (Ostrobothnia, Oppland, Päijät-Häme, Hamburg), NGO driven industrial awakening (LIC, Latvia) and Circular economy (LIAE, Västerbotten).

During the presentation, it was mentioned that Oppland's FORREGION –project might be useful in order to bridge the gap within SME and university collaboration, as it is based on this idea. Stakeholders agreed with this view. Other interesting cases were mentioned to be Hamburg's FORCE-project, since circular economy was identified as important future focus for the region and LIAEs biogas-based activities, which could be compared with similar activities in the region. Overall, the cases were considered interesting, although some of them were similar to some existing activities in the region, similar to network building in Västerbotten and cluster collaboration in Päijät-Häme.

The three chosen good practises were discussed upon, but no conclusion was drawn which one the region should focus on. FORREGION was however discussed the most. The stakeholders suggested that project team should look for more information of the presented cases and after inspection that is more thorough decisions could be made. It was also mentioned that probably none of the presented good practises would work in a very similar manner in the region, but would need to be adjusted to meet the regional needs.

Based on the interest of the stakeholders and the overall discussion, the project team has decided to look more into FORREGION project, as this is verified by stakeholders and is addressing a clear gap in regional development. It is also easily transferrable into energy technology focus, which is the focus for the region.

FORREGION good practice is enhancing collaboration and knowledge brokering by connecting SME's with universities. At the very least, it provides a good case to look upon and make it possible to have a dialogue between similar partners from other European regions.

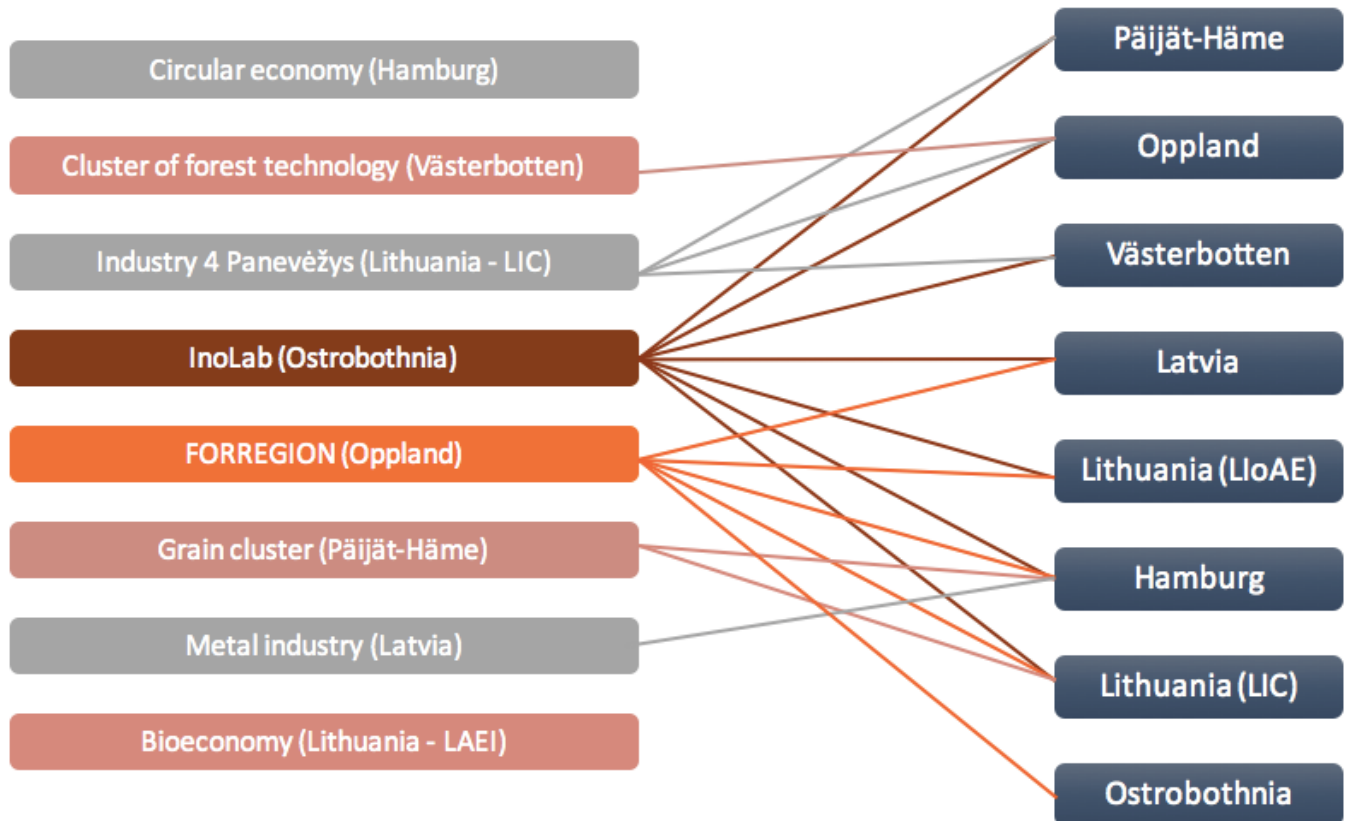
FORREGION is driven by public institutions in Norway, but development agencies might be other solution in Finnish context. Funding might be an issue and needs to be looked upon.

### 3.2. Summary

Through the Transnational Learning Seminars with stakeholders, each region could identify and select at least one good practice from other LARS regions that can help them to overcome the gaps they have. The following table and figure show the good practices and their matches, as well their driver (university, public organisations, companies or NGOs).

Driver	Region	Good practice	Matches
University-driven	Ostrobothnia	InoLab	Oppland
			Lithuania (LIC)
			Latvia
			Lithuania (LAEI)
			Päijät-Häme
			Hamburg
			Västerbotten
Public organisation-driven	Oppland	Forregion	Latvia
			Lithuania (LAEI)
			Hamburg
			Västerbotten
			Ostrobothnia
Company-driven	Päijät-Häme	Grain cluster	Hamburg
			Lithuania (LIC)
	Lithuania (LAEI)	Bioeconomy	-
	Västerbotten	Cluster of forest technology	Oppland (cluster of forest technology)
	Latvia	Metal industry	Hamburg
	Lithuania (LIC)	Industry 4 Panevėžys	Päijät-Häme
			Oppland
			Västerbotten
NGO-driven	Hamburg	Circular economy	-

Table 4 Summary of good practices and their matches



The most popular good practice is InoLab from Ostrobothnia region, a university-driven practice that was selected as benchmarking for all partners. This initiative consists in different platforms to lower boundaries for companies, NGOs, public organisations and civil society to contact universities. This policy based on good relations among helixes' actors allows to open doors for cross-sectoral collaboration and it is considered powerful to close regions' gap, since new discoveries can often be found through cross-sectoral approach, it lowers the organizational barriers and opens doors for wider society and it allows for implementing the open-science concept, a rising trend in the global research field.

Forregion in Oppland is another popular good practice and five partners (Latvia, Lithuania – LAEI, Hamburg, Lithuania – LIC and Ostrobothnia) selected it as a possible initiative to overcome their gaps. It is public organization- driven that promotes research-based innovation and collaboration with researchers and scientists for businesses with little or no research and development experience, increasing their internal capacity of innovation. Forregion allows the interaction between research and scientific institutions and business (SME and bigger companies), as well public organisations act as intermediaries, providing support (financial and knowledge) to push innovations, involving the helixes' actors.

Industry 4 Panevėžys is a company and NGO-driven initiative that incorporates different activities aimed at the development of the Industry 4.0 in the region of Panevėžys and it establishes a platform where experts from various fields discuss and present important regional trends, helping regions and sub-regions to transform and be more innovative with basis in their strengths. This practice allows lower collaboration boundaries between different stakeholders, including business, education, science and public sector representatives in order to foster the innovative ideas generation, knowledge sharing and ensure the continuous flow of the investment in the region.

Some regions believe Industry 4 Panevėžys, as a benchmark, can teach how start the transformation of the regional strategy in whole innovation ecosystem: starting from primary schools and informal learning and continuing with the R&D institutions that develops solutions for local companies.

Grain cluster was selected by two regions as a good practice that can bridge their gaps. This is a company-driven practice that connects industry companies and universities, research institutes and NGOs, fostering circular economy for more efficient and innovative use of resources.

## **4. Steps toward the implementation of good practices in the regions**

### **4.1. Päijät-Häme**

- Clarified VISION: “The world's most innovative grain cluster and ecosystem”;
- Questionnaire to cluster members about future vision, internationalization and cooperation with other industries and how they see the potential of Circular Economy innovations and business in future;
- Aims for implementation project from companies’ perspective.

The next concrete step is to gather future prospects from grain cluster companies and goals related to the development of the cluster and change the mind-set from cluster to ecosystem. Regional Council is interested to make some comparison between Vaasa Innovation platforms and research platforms of Lappeenranta University of Technology. Päijät-Häme and Lithuanian Innovation centre is having also similar interests to developing cluster models and structure. Lithuanian Robotics cluster and Päijät-Häme Grain and Mechatronics cluster can learn from each other.

It is also necessary to update the existing regional good practices that has been already done to develop university – company cooperation.

- Lahti Venture Program, LADEC
- Lahti Master's Degree Accelerator (Gradu kiihdyttämö), Yliopistokampus
- Universities as drivers of innovation – DYNAMO, LAMK, TwinInno

Benchmark: Vaasa Open Innovation Platforms and Lithuanian Robotics cluster

- Workshops with regional stakeholders and matching partners

## 4.2. Oppland

• **Step 1.** The Planning strategy for the new region. This is the overarching policy document which points the direction for the next period. We are currently working on the priority themes, and one is Innovation. Here we see Smart specialisation as crucial to succeed with increased value creation. Cooperation between the different helixes and stakeholders will be the basis for this work. The criteria for success is Cooperation, Trust and Competence.

• **Step 2.** Different regional plans and strategies on the priority areas defined in the planning strategy.

- **Step 3.** The regional plan and/or strategies must be followed by financial measures.

## 4.3. Lithuania (LIC)

Panevezys County has made their own digitalisation of industry strategy that allows them to better understand and define what kind of steps are needed and who should be involved in this process. The regional focus group meeting has an opportunity to reflect on these steps and rethink what kind ideas could be transferred from the practices identified in LARS project.

These are the steps that region should take in order to successfully implement regional strategy, some of those actions have been already taken:

- We held a regional debate on engagement of regional authorities to support building ecosystem with policy decisions: the debate helped the industrial city of Panevėžys to streamline the city's vision as a hub for industrial robotics and automation: from regional strategy to "learning robotics" in local educational institutions. (Results: robolabas, steam centre)

- Currently the main object is to create a structure of a regional development agency which would have clear role and objectives to help for business entities. The main focus should be put on help in reskilling of people, prototyping new products, reframing their factories to meet digitalization requirements, adopting new business models and improving their processes. The following steps will be taken to establish a new organization:

- Decisions on structure and main functions of regional development agency.

- Decisions and negotiations on the budget of regional development agency.
- Creation of network: international companies, universities, national support agencies etc.

#### **4.4. Lithuania (LAEI)**

• Firstly, strengths, weaknesses and opportunities of bioeconomy (biogas) sector in Lithuania were prioritised that were identified at the 1<sup>st</sup> Focus group meeting of stakeholders that took place in Vilnius on 15 November 2018.

• Secondly, actions to be taken to overcome existing gaps were discussed.

• Thirdly, good practices from partner regions in RIS3 strategies were presented and selected for learning and adaptation for improvements in bioeconomy (biogas) sector in Lithuania.

• Finally, policy recommendations with proposed actions based on selected good practices from partner regions will be prepared and submitted for the Ministry of Agriculture of the Republic of Lithuania aiming to include it to the RDP of Lithuania for 2021–2027.

#### **4.5. Latvia**

As we have chosen the good practice, the next step is to make policy transfer and implementation after that. Despite the fact that policy transfer will be the main activity of WP5, some starting points will be given in this paragraph.

The first thing that should be done is to make a more detailed analysis of the chosen practice. This will be done using the partner reports that contain the story behind good practice but it is possible that it's not enough with provided information so a study visit to sending region could be useful. Of course, the possibilities of organizing such a visit depends on the budget and other resources of every partner. The idea of this visit is to have more inside information and the opportunity to ask relevant questions.

After the outlook of good practice will be clear and detailed analysis will be made, the next steps will be taken in the WP5 – description of strategies of change and mapping the barriers. Report on this will be made in WP5 as well as focus group meeting in order to get feedback from relevant stakeholders. At the implementation phase, the idea is that the adoption of chosen good practice will be included in policy paper/strategy for the future work for MoEPRD.

## 4.6. Hamburg

The next steps for the implementation in Hamburg should be taken to increase the connectivity in the helix of universities and research institutions. To enhance the collaboration a platform for all research institution doing research in the field of circular economy should be initiated. Regular meetings and the development of a platform for research in circular economy will be planned to increase collaboration and create opportunities for more projects and more funding by joining forces and networking. When the cooperation between universities is developing, a partner with high legitimacy and power from a public institution should be found to cooperate and lead the action. The next step would be to engage other institutions like companies, public administration and NGOs into projects for cross-sectoral collaboration.

## 4.7. Västerbotten

- Locating important actors
- Finding the drivers
- Agree on the vision
- Setting realistic project expectations and adjust expectations as soon as necessary
- Finding resources
- Having a flexible system that can meet the demand of the actors
- Communicate, communicate, communicate
- Hold productive meetings

## 4.8. Ostrobothnia

Next step is knowledge gathering of the FORREGION good practise. After hearing the full story behind the practise, project team can once again ask for stakeholder's opinion. In this second meeting there should already be decision making regarding the practicalities for its implementation. This discussion of practicalities should take into consideration which of the identified gaps it is bridging, who should be involved and what should be done, as well as possible resources, which might be offered for a pilot project. One also should consider how to evaluate the pilot in order to verify whether it is a success or not.

As has been expressed by our stakeholders, the focus should not be in copying a good practise directly, but instead the idea of a good practise should be transferred into regional context. This action



requires solid planning but also eager stakeholders who are willing to participate in the experimentation. Therefore, it is important for the implementation that the stakeholder's views are respected and they are involved even more in the second round of discussion.

One concrete suggestion for implementing the FORREGION-good practise was related to international students, as was suggested that there would be a development day, where SMEs could bring their challenges and international and native students, who are eager to show their knowledge in practise, might solve these. This suggestion might perhaps be widened to public sector as well, so that public organisations might bring their own challenges with them to be solved by students. This would create interaction between the entities with the biggest gaps and it might improve the regional collaboration activities. This is one concrete suggestion that can be presented in the second meeting with the stakeholders as well.

## 5. Conclusions

From Päijät-Häme's conclusions, the practices presented did not bring much debate from our stakeholder's side. Based on earlier experiences on EU joint projects, expectations were not very high. In principle collaboration and exchanging information interested them but the benefits that are expected must be concrete enough. Companies representatives did not have much to say or comment for transnational benchmarking. They expect that intermediary organisations, like regional development company and universities, will bring and apply good practices to the region as appropriate, focused on the needs of the company as much as possible.

Regional development company who coordinates cluster cooperation in Päijät-Häme wants to learn more from other cluster models. Grain Cluster companies discussed about expanding the group and necessity of "out of the box thinking" and reorganization and a more formal, focused approach. In Grain Cluster board meeting, representatives wanted a presentation and suggestions about the possibilities of how to develop cluster further.

For Päijät-Häme, challenge is that regional universities do not offer the core knowledge that grain business needs. Can idea of Open innovation platform create possibilities to build new kind of research collaboration? Cooperation with universities is one of the important ways to fund innovations and research. Now grain cluster companies cooperate with national actors rather than regional that means less funding and expertise to our region. New cooperation models are needed especially between educational institutes and universities. If the collaboration between universities and companies would be more intense, more funding could be directed to the region.

Oppland region concluded that better triple-helix connectivity is important for future development. It is very important to showcase the importance and relevance for the SME to involve in R&D. Public sector must identify targeted instruments/measures to bridge the gap between the businesses and R&D institutions.

The focus group meetings conducted among quadruple helix actors (enterprises, research institutes, public institutions and NGOs) in Panevezys County, Lithuania indicated that cooperation among those partners is crucial and that is the reason why Panevezys region developed its own regional strategy to facilitate the cooperation among all innovation actors. However, regional development strategy raises a lot of challenges and it is very important to select priority areas where changes are needed the most and create the roadmap how to deal with those challenges.

The participants that took part in the focus group meetings in Lithuania (LIC) indicated a number of barriers (gaps) that hamper or even make it almost impossible to establish regional value chains. The most important one was identified between business entities and other quadruple helix actors mainly public institutions (ministries and municipalities) and universities. The latter provide just a few R&D services or the quality of these services is unsatisfactory. Also, business entities would like to increase the prestige of local universities cause today very few graduates choose to stay in Panevezys county for their bachelor degree. In addition, business owners expressed their opinion that public organizations must direct more resources to create an entrepreneurial and cooperative culture among all innovation actors.

In Lithuania (LIA), all these problems and needs related to quadruple helix collaboration mentioned by the participants were taken into consideration, in response to these gaps several good practices suggested by LARS project partners were presented. Local stakeholders emphasized the most important features in those practices and admitted that learning from other regions could help to overcome existing gaps. The main focus will be put on the discovery of main regional development agency functions and facilitation of local research institutes.

Overall Latvia concluded that the approach chosen for the project and especially the idea of transnational learning seminars works very well. Transnational learning seminars provide an opportunity not only to discuss the good practice in this region but to tell about the good practices from other regions. In such a way it was possible to make some initial benchmarking (which will be continued in WP5). If there wouldn't be any good practices from partner countries to speak about, the concept of Latvia's good practice wouldn't be sufficient.

During transnational learning seminar, Latvia region could understand that from every good practice they can take and adopt some elements and it is only up to them – how do they use them in our regions. If the good practice in the sending regions works well it doesn't mean that the same result will

be in the receiving region. If the homework at this stage (the story behind the good practice, factors for success and failure, etc.) won't be done adequately, most probably even the best practice will face failure. Also, one important conclusion appeared in the learning seminar – in this case, there needs to be someone in public administration to motivate, to push forward. It doesn't definitely mean that the public sector should be the driver (but the question of who needs to be the real driver is still debatable), but it definitely means that the public sector should support new ideas and activities because otherwise, it will be hard to implement them.

In Lithuania (LAEI) region, results of focus group meetings confirmed that using of Quadruple helix model with involvement of 4 types of stakeholders (private sector, public sector, universities and research institutes and NGO's) are good tool for improvement of gaps that are identified in selected areas for RIS3 implementation within partner regions in LARS project: in bioeconomy (biogas) sector.

The biggest challenge (gap) for Lithuania was identified between public institutions (ministries that are responsible for bioeconomy sector in Lithuania) with other stakeholders of Quadruple helix. Continuous work of the LARS project with public institutions (Ministry of Agriculture, Ministry of Energy and Ministry of Environment of the Republic of Lithuania) helped to get positive results and to make these institutions more open for work and discussions with other actors of this helix and this was confirmed at the 2<sup>nd</sup> Focus grouped meeting when representatives of the ministries reflected to the process on bioeconomy (biogas) in Lithuania and shared their vision.

For Lithuania (LAEI), transnational learning of good practices identified by the LARS project partners play an important role for potential improvements in selected area by pilot actions implementations. For Lithuanian case the focus will be based on policy recommendation aiming to close collaboration gaps for smart specialization development by including the necessary measures into the RDP programme for Lithuania for 2021-2027 to support smart specialization in circular and bioeconomy.

The HORIZON 2020 project FORCE was identified as a good practice in Hamburg. The project helped to intensive the regional connectivity for the circular economy for WEEE. The project is an example and a first step to improve the still fragmented regional connectivity. Examples and other good practices from other regions in the project helped to develop a plan how to further improve the regional connectivity and to bridge the existing gaps in the innovation network. As next steps, the involved research institutions will reach out to other universities working with circular economy. To intensify, the cooperation between research institutions it is planned to develop a knowledge platform. This platform should help to join forces for more research, projects and funding. Stakeholder from all other helices shall be involved and attracted step by step in the following years.

In Västerbotten, the transnational learning was a good way to get new ideas how other region has been working to accelerate their innovation development. To be successful it is important that the actors

have time to go through the best practices and that we make it “our own” so it can be transferable in the regions and our own development. It was difficult to get the actors to define one good practice to committee to, this can be explained by the various interests in what areas the stakeholders represent. From Region Västerbottens perspective we see that it's very important to join forces with the different processes that is ongoing and strengthen the dialog and the input with the LARS-perspective to get the most value.

For Ostrobothnia's conclusions, all of the presented good practices were considered to be relevant and useful approaches to regional development. Stakeholders were interested to learn more about the good practices and project team has decided to focus on FORREGION in the next phase. Some of the identified good practices were similar to existing activities in the region, despite having different types of actors and industries as basis. Overall, the learning seminar was a very positive experience, as several stakeholders were present and there was great discussion happening around the good practices, as well as general development challenges in the region.