Smart Specialisation in the Baltic Sea Region
– Learning towards Macro-regional Specialisation

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BSR S3 Ecosystem

Contents

ABBREVIATIONS

BSR	Baltic Sea Region
EC	European Commission
EDP	Entrepreneurial discovery process
ESIF	European Structural and Investment Funds
ETC	European Territorial Cooperation
EU JRC	European Union Joint Research Centre
EUSBSR	EU Strategy for the Baltic Sea Region
FDI	Foreign direct investment
IM	Industrial modernisation
I3	Interregional Innovation Investment
NSPA	Northern Sparsely Populated Areas
OP	Operational Programme
RDI	Research & Development & Innovation
R&D	Research and Development
RIS3	Research and Innovation Strategies for Smart Specialisation
S3	Smart specialisation
SMEs	Small and Medium-sized Enterprises

Executive summary

Introduction

Smart specialisation (S3) is said to be the European Union's most ambitious regional innovation policy programme with the aim to boost European competitiveness through innovation. The existence of a Research and Innovation Strategy for Smart Specialisation (RIS3) is a precondition for the European regions to receive European Structural and Investment Funds. Since 2014, over 180 such strategies have been developed at regional and national level across the EU.

This report is based on interviews with nine BSR regions that have been lead partners or partners in Interreg S3 projects: Central Finland, Hamburg, Helsinki-Uusimaa, Lithuania, Mecklenburg-Western Pomerania, Päijät-Häme, Tampere Region, Trøndelag and Västerbotten. The report describes their regional S3 process stories, good practices and interregional activities tested in S3 Interreg projects. The report aims to improve understanding of the status of S3 in the Baltic Sea Region and provide an overview of the potential and needed elements to enable the deepening of macro-regional S3. The report is written as part of the BSR S3 Ecosystem Platform project (2019-2021) financed by the Interreg BSR Programme.

The regional S3 process includes various stages from strategy design and selection of priority innovation areas to implementation, monitoring and decision-making. The basic idea is an interactive process, namely the 'Entrepreneurial Discovery Process' (EDP) in which public administrations, research, business and other innovation stakeholders co-decide the priority fields for the strategy based on the resources and capabilities in their territory. EDP should be seen as a continuous process.

During the current EU funding period (2014-2020) the regions have implemented various interregional activities in S3-focused projects financed by Interreg Europe and Interreg macro-regional programmes aiming to strengthen S3-related capacities and interregional partnerships. Simultaneously, the European Commission has launched several initiatives, such as 'S3 thematic networks' and the proposal of a new 'interregional innovation investment' instrument for post-2020 for the purpose of developing interregional, thematic European value chains. The Baltic Sea macro-region with the EU Strategy for the Baltic Sea Region as a supporting framework has a momentum to influence conditions enabling a highly tailored and place-sensitive approach for the development of interregional value chains for stronger and sustainable innovation performance.

Findings

All regions have their unique approach to S3 and EDP influenced by their historical backgrounds, economic structures and innovation policies. Some regions invest more time and resources including inclusive workshop processes, megatrend-analyses and external facilitators to the RIS3 design, while others tend to consult only a limited group of stakeholders. According to interviews, the practical utilisation of the quadruple helix principle - that adds civil society to public-academia-business triple helix - remains still vague and is adopted only in a few regions. Major practical challenges linked to EDP and stakeholder engagement are related to communication and ways of coordinating the interaction so that it brings concrete added value to involved stakeholders and to the region as a whole and so that one stakeholder does not dominate the whole process. It is also a fact that more complex EDP usually requires more resources.

The findings of this study indicate that the basis for the development of strategic interregional S3 is built on a successful EDP, good S3 governance, awareness of innovation ecosystems and sufficient flexibility to adapt to new developments at the regional level. It also requires political will and commitment.

The interviewed regions - like all EU regions - have updated or are currently updating their RIS3 strategies for the next EU funding period (2021-2027). The new strategies aim to be more future-oriented and cross-sectoral in their selection of S3 priorities with heightened efforts on better governance and monitoring. They emphasise more such cross-cutting issues as resource efficiency, carbon neutrality and social innovations in line with the EU Green Deal aims related to sustainable economic transition. The Covid-19 Pandemic and other global challenges force regions to foster regional mechanisms capable of foreseeing and reacting to rapid changes.

S3 Interreg projects have been a good way to strengthen S3 capacities, share and learn from other regions to support RIS3 implementation. The value of the good-practice exchange appears largely dependent on the components and design of the project consortia and activities. A few projects have built S3-related networks (RDI2Club and BIOREGIO), some have developed and piloted methodologies to strengthen regional S3 (LARS, EmpInno) and interregional S3 (GoSmart BSR), while others have focused on joint S3-releated challenges and organised well-prepared study visits and interregional innovation camps to find new perspectives and solutions to those challenges (SmartUp BSR and BSR Stars S3). There have also been projects which have adopted a strong influencing towards shaping future EU-level policies regarding interregional S3 (ClusterFY and S34Growth). The experiences from these projects linked with regional smart specialisation processes provide valuable knowledge for the future development of interregional S3 and offer rich learning insights for other regions.

1. Introduction

1.1 BACKGROUND

Smart specialisation (S3) is a systematic policy process with the aim to make European regions more competitive through innovation. The S3 approach to regional economic development was introduced to European regions by the European Commission (EC) in 2014. Since then, over 180 Research and Innovation Strategies for Smart Specialisation (RIS3) have been developed at regional and national level across the EU.[1] The basic idea behind the S3 process is to enable regions to identify and develop their own competitive advantages based on the resources and capabilities in their territory.

Regarding the European budgetary period 2014-2020, the EC established that the Operational Programmes (OP) for the European Structural and Investment Funds (ESIF) should support actions in the regional/national RIS3. This means that one implicit precondition for the EU member states and their regions to receive ESI Funds has been the existence of a RIS3. (Foray et al 2012). In practice, many regions and countries have integrated RIS3 into their national or regional research and innovation strategies, while others have prepared a separate RIS3 document to complement existing innovation policy frameworks.

Corina Crețu, the previous European Commissioner for Regional and Urban Policy stated in 2016 that

"Smart specialisation represents the most comprehensive policy experience on implementing innovation-driven progress in Europe. Thanks to this effort, for the first time, public authorities and stakeholders across an area of more than five hundred million inhabitants have crafted their innovation policy according to a common set of principles and methodologies."

In recent years, the S3 concept has evolved to adopt a stronger interregional focus. The S3 process enables the regions to identify their assets, global uniqueness, and further seek out other European regions with similar or related priorities, with the aim of joining forces and generating scaled-up innovation efforts and investments, for international competitiveness. Reflecting this, the post-2020 proposals for Cohesion Policy's European Territorial Cooperation (ETC) Programmes include an 'interregional innovation investment' (I3) instrument (previously called 'Component 5'), which is strongly linked to the EU's ambition to promote S3 interregional dimension and build European value chains for stronger international innovation performance.[2] In practice, the I3 instrument could support joint investment e.g. in RDI infrastructure and equipment in one region to be used by companies also from other regions. This requires a new approach to EU innovation-focused funding instruments, regional coordination, long-term trust building and (political) motivation through clear identification of mutual benefits.

There is significant scope for macro-regions, for example the Baltic Sea Region (BSR), to influence conditions enabling long-term strategic interregional S3. Offering a fertile testing ground for its regions to develop new and reinforce existing, industry-led collaboration efforts, the BSR can develop a highly tailored and 'place-sensitive' approach to S3. (Hunter 2019). However, there is a need to first identify and analyse the S3 methods, tools, practices and new models of collaboration tested in various projects to better understand how existing / emerging policies and practices can support this effort.

This report is written as part of the BSR S3 Ecosystem Platform project (see below) financed by the Interreg BSR Programme. The purpose of the report is to improve the knowledge and understanding of the status of S3 in the Baltic Sea Region and tested interregional S3 activities as well as provide an overview of the potential for strengthening macro-regional S3. The report is based on interviews with nine BSR regions that have been involved in interregional S3 projects.

1.2 BSR S3 ECOSYSTEM PLATFORM

This report is part of the *BSR S3 Ecosystem Platform* project[3] (2019-2021) that strives to support the building of an S3 ecosystem, where BSR regions (and their industries) can draw on their collective strengths to carve out new innovation-focused value chain opportunities. All involved project partners have been lead partners or partners in successful Interreg BSR and Interreg Europe projects with a focus on capacity building in smart specialisation.

The project aims to raise awareness and understanding of politicians, decision-makers and innovation actors - especially at regional level - of the opportunities and challenges related to S3. It contributes to realising a tailored policy framework, which supports the development of a macro-regional approach to S3, for use and further development beyond the project lifetime.

A key element of the BSR S3 Ecosystem Platform has been the set-up of a BSR Directors' Network[4]. This Network comprises a voluntary group of BSR regions, represented by senior regional Directors who have a key responsibility for overseeing strategic direction for S3 in their regions. Still in its

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[1] https://s3platform.jrc.ec.europa.eu/smart-stories

[2] https://ec.europa.eu/regional_policy/en/newsroom/consultations/interregional-innovation/

[3] The BSR S3 Ecosystem Platform is financed by the Interreg BSR Programme with the following partnership: Region Västerbotten (Sweden), the Baltic Institute of Finland (Finland), Aalto University (Finland), Lahti University of Applied Sciences (Finland), Hamburg Institute of International Economics (Germany), Agency for Science, Innovation and Technology (Lithuania) and Trondelag County Authority (Norway). Project platform is a project type that supports cooperation among partners of projects implemented in a certain thematic field, e.g. smart specialisation or clean shipping. Project platforms aim to increase cooperation between Interreg BSR and other EU-funded projects in a specific area as well as ensure better durability and transferability of already implemented projects' outcomes.

[4] The Directors' Network was initiated and coordination efforts are supported by Region Västerbotten.

infancy, this Network aims to strengthen collective capacity to share S3 and innovation knowledge and experience and to consider options and actions for joint S3 working across the BSR. The Network remains open to other interested BSR regions and plays a key advisory and decision-making role in supporting the development of the BSR S3 Ecosystem Platform.

At a practical level, the project has a special focus on developing a methodology and a manual to assist in mapping BSR interregional value chains. This aims to generate a stronger practical focus and roadmap for how BSR countries/regions can identify other regions across the BSR where there are related S3 priorities and to provide guidance on gathering evidence of mutual or complementary interests. The project will also design and deliver an interregional training programme on S3 and the value chain mapping methodology.

1.3 PURPOSE AND METHODOLOGY

The main purpose of this report is to increase understanding of the status of smart specialisation in the Baltic Sea Region and provide an overview of the potential, good practice tools and support, which BSR actors could apply in taking forward macro-regional S3 cooperation.

Specifically the report analyses:
1. RIS3 regional planning and implementation with a focus on the Entrepreneurial Discovery Process - EDP - in selected BSR regions
2. Interregional S3 activities that the BSR regions have developed and tested in various projects, namely Interreg Europe and Interreg BSR projects

The report is based on relevant literature sources and interviews with the seven BSR S3 Ecosystem Platform partner regions: Hamburg, Helsinki-Uusimaa, Lithuania, Tampere Region, Päijät-Häme, Trøndelag and Västerbotten as well as two additional BSR regions: Central Finland and Mecklenburg-Western Pomerania.. Two additional BSR regions were also included in the interview programme: Central Finland and Mecklenburg-Western Pomerania. The rationale for selecting the case regions is based on their involvement in interregional S3 projects. The case regions cover urban, rural and capital regions as well as the Arctic. The interviews were conducted via Teams during April-June 2020. Figure 1 shows the nine interviewed BSR regions on the map.

Figure 1. Regions interviewed for this study.

Source: Nordregio.

1.4 SMART SPECIALISATION AND EDP

According to Foray et al (2012), the RIS3 strategies do five important things:

- They focus policy support and investments on identified key national/regional priorities, challenges and needs for knowledge-based development.
- They build on each country/region's strengths, competitive advantages and potential for excellence.
- They support technological as well as practice-based innovation and aim to stimulate private sector investment.
- They get stakeholders fully involved and encourage innovation and experimentation.
- They are evidence-based and include sound monitoring and evaluation systems.

The findings of e.g. Teräs and Mäenpää (2016) point out that the S3 process is a challenging exercise for any region, because the process is based on the unique assets and innovation actors of each particular region. Each region has different challenges and unique abilities to solve them. Moreover, the key concepts associated with S3 are subject to different interpretations in different regions. Therefore, based on earlier studies, it can be stated that 1) the European regions have differentiated degrees of preparedness to embrace an S3 approach, 2) there is no exact model of S3 process suitable for all regions and 3) a successful S3 process cannot be copied from other regions. However, it should be noted that the regions can benefit greatly from learning from other regions regarding various S3 elements, such as governance, prioritisation, monitoring and evaluation (see e.g. Pellegrin and Catalano 2019).

S3 aims to be an integral part of regional development planning. The RIS3 process "*must be interactive, regionally-driven and consensus-based*". To achieve this, RIS3 strategies are organised through an inclusive and interactive bottom-up process, known as the Entrepreneurial Discovery Process (EDP) in which public administrations, research, business and other innovation stakeholders co-decide the priority fields for the strategy. (Foray et al 2012). EDP is a key element of S3 that enables innovation stakeholders to interact and collaborate during the whole S3 process.

Implementing Smart Specialisation Strategies Handbook (Gianelle et al 2016) is written based on practical experiences. It describes well the nature and challenges of the EDP: "*For successful EDP it is crucial to keep engaging stakeholders throughout the different stages of the policy-making process. The challenge is to maintain the dynamics generated during the elaboration of the national and/or regional S3 along the different stages of the policy cycle.*" (See Figure 2).

European regions started working with S3 in 2014, and the nature of EDP varies significantly between the regions. Some regions have engaged only a limited group of key stakeholders and other regions have adopted a more open approach from the very beginning. Now the regions are preparing for the next EU financing period, and have updated or are updating their RIS3. One of the current key topics of discussion is how to develop new ways in which also citizens, social entrepreneurs and NGOs can cooperate to tackle complex societal challenges, and to generate stronger, collective innovation capacity across regions. This *quadruple helix* approach to S3 differs from the traditional public-academia-business *triple helix* approach with inclusion of a fourth helix - civil society - into the RIS3 design and implementation.

Figure 2. The EDP cycle.
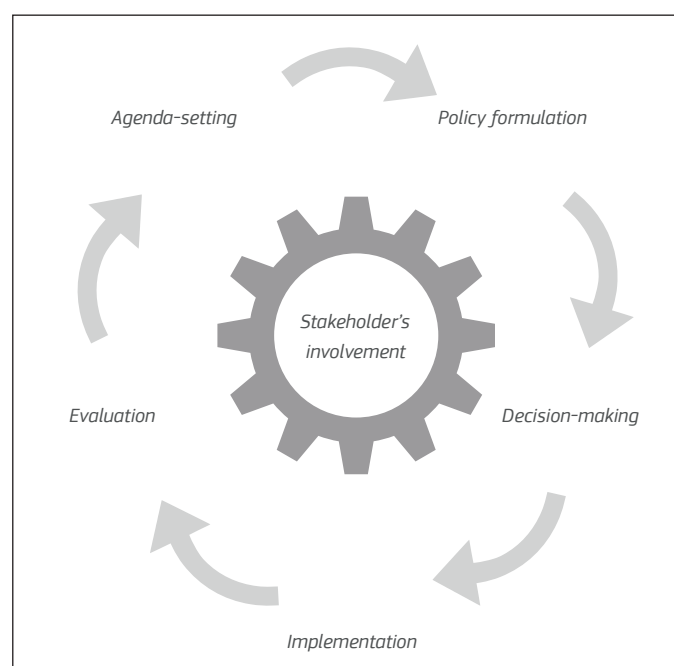
Source: Kyriakou and Periañez-Forte (2016), based on Lasswell (1956).

2. EU level approaches to interregional cooperation

2.1 EU S3 PLATFORM

The S3 Platform[5] maintained by the EU Joint Research Centre (JRC) provides support for the regions in their RIS3 planning and implementation. The EU S3 Platform provides information, methodologies, studies and guidance to national and regional policy makers. The S3 Platform is also a significant enabler of interregional learning. There are currently 19 EU countries and 177 EU regions as well as 7 non-EU countries and 30 non-EU regions registered in the S3 Platform. However, there are huge differences between the regions in how actively they participate in the activities organised by the S3 Platform.

2.2 THEMATIC S3 PLATFORMS

Starting in 2015, the EC launched altogether three 'thematic S3 platforms': Agri-Food, Energy and Industrial Modernisation that include various specific areas. In particular, the thematic S3 platforms support the building of interregional partnerships across the EU through the involvement of industry and clusters. These collaborative networks have the ultimate goal of connecting European ecosystems to transnational and interregional collaboration in regions and countries with similar or complementary S3 priorities. Some of the partnership activities are further supported by Interreg Europe.

The EC has recently prepared a manual that documents several good interregional practices observed during the past few years. For example, the Thematic S3 Platform for Industrial Modernisation (IM) has supported over 20 interregional partnerships based on shared S3 priorities related to IM. Four EC Directorates General (REGIO, GROW, RTD and the JRC) support this action. Thematic areas of the IM partnerships include Artificial Intelligence and Cybersecurity, Innovation Textiles, 3D Printing, Advanced Manufacturing and Non-Food Biomass. As of January 2019, stakeholders from over 100 European regions were involved in the activities of these IM partnerships. They are working together towards achieving a shared objective of fostering innovation, creating new value chain linkages and developing joint innovation investments. (Rakhmatullin, Hegvi et al 2020). Based on the growing demand for and success of this type of activities, interregional S3 cooperation is now also part of the enabling conditions for ERDF Operational Programmes in the 2021-2027 programming period.

2.3 EU MACRO-REGIONAL STRATEGIES: S3 IN THE EU STRATEGY FOR THE BALTIC SEA REGION

The Baltic Sea Region has a long tradition of cooperation that has generated multiple networks and organisations in the region. Based on this tradition, in 2009 the EU Member States in the region decided to start a new type of transnational cooperation by creating a macro-regional EU Strategy for the Baltic Sea Region (EUSBSR). Today there are altogether four macro-regional EU strategies (BSR, Danube, Alpine as well as Adriatic & Ionian Region).

The EUSBSR is divided into three objectives, which represent the three key challenges of the BSR: saving the sea, connecting the region and increasing prosperity. The new updated EUSBSR Action Plan will be approved in autumn 2020[6], and it comprises 14 Policy Areas (PAs) which represent the main areas where the EUSBSR can contribute to the three main objectives. The concrete implementation of the Action Plan takes place in joint transnational actions, projects and processes.

The EUSBSR Policy Area Innovation (PA INNO) promotes a globally competitive position within innovation for sustainable economic growth in the BSR. Earlier PA INNO experiences and results on transnational S3 are providing strong evidence and a good basis for the next wave of S3 in the next EU programming period. Therefore, the new PA INNO Action Plan underlines a challenge-driven approach to innovation and further development of interregional value chains in key BSR S3 fields, such as circular and bio-economy, blue growth, digitalisation and health. The aim is to support the development of interregional value chains across the strongest S3 areas in the BSR through various financing instruments.

2.4 S3 IN EU INTERREG PROJECTS

The 2014-2020 ETC Programmes include the Interreg Europe programme and four macro-regional Interreg programmes[7]. These have supported S3 capacity building and implementation during the current funding period. Interreg projects have played an important role in fostering the interregional discussion and learning related to S3 as well as enabling pilot activities towards interregional S3 actions.

The Interreg Europe (IE) programme has supported projects in which interregional consortia from different parts of Europe develop a set of peer-learning activities, followed by action-plans, aimed at concrete improvements in policy instruments. The IE programme has given priority to projects focused on instruments in ERDF Operational Programmes that have a direct link to S3. Altogether 65 financed projects have resulted in regional action plans e.g. within similar or related S3 priority fields and identification of interregional cooperation opportunities based on shared priorities.

The Interreg Baltic Sea Region (BSR) Programme is one

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[5] https://s3platform.jrc.ec.europa.eu/

[6] https://www.balticsea-region-strategy.eu/news-room/news/591126-eusbsr-action-plan-approved-by-the-national-coordinators-group

[7] https://www.europarl.europa.eu/factsheets/en/sheet/98/european-territorial-cooperation

of the four transnational programmes that are linked to European macro-regional strategies. This means that projects financed by e.g. the Interreg BSR Programme need to show their connection to the EU Strategy for the Baltic Sea Region. One of the BSR Programme sub-priorities has supported projects aiming for S3 capacity-building through transnational cooperation. Altogether 37 projects with an aim to enhance S3 implementation in the BSR have been financed by the Interreg BSR Programme.

The next chapter provides an overview of the status of S3 and approach to EDP in the interviewed BSR case regions. The chapter includes also descriptions of the interregional S3 activities of Interreg projects that have been implemented by the case study regions.

3. Smart Specialisation in the Baltic Sea Region

3.1 OVERVIEW ON THE INNOVATION POLICY OF THE INTERVIEWED COUNTRIES

The interviewed regions are from Finland, Sweden, Germany, Lithuania and Norway. Each country has a different economic structure and background of innovation policy, and therefore different positioning regarding S3.

In **Finland** the 19 regional councils have the responsibility to conduct the RIS3 process. The S3 approach was familiar to the Finnish regions as it has similarities with the programme-based regional development policy (Regional Center of Expertise Program) that started in 1994. A national level approach to S3 is the so-called 'Six City Strategy' that has channeled part of ESI-funds to the smart city cooperation between the six largest cities: Helsinki, Espoo, Vantaa, Tampere, Turku and Oulu.[8] The strength of the Finnish innovation system is its long tradition of good connections between the triple helix actors and high levels of investments in RDI. Currently Finnish innovation policy focuses on multidisciplinary innovation ecosystems that are based on the idea of evolving and integrating key players according to market demand (Ministry of Economic Affairs and Employment of Finland 2020).

In **Sweden** RIS3 is conducted at the regional level by 21 regional councils. The Swedish innovation system is largely based on cooperation between state, big industrial firms and labour unions as well as national funding programmes for strategic areas. This has resulted in a strong export-oriented business sector with high capabilities in RDI. The start of S3 was challenging for some Swedish regions, as there were

initially no national coordination mechanisms to support regional work on RIS3. This caused different interpretations of S3 and the development of RIS3 was mainly based on the individual capacities and ambitions of the regions. In 2016 the Swedish Agency for Regional and Economic Growth started to promote interregional learning and cooperation between Swedish regions in their work with S3. Since then many non-capital regions have established networks with other regions with the aim to initiate S3-related joint projects and join forces at the international level.

In **Germany** the 16 federal states are responsible for RIS3. Notable is that the approach to S3 in different states varies significantly. Some federal states already had extensive strategies underpinned by RDI, while other states had to work much more in creating RIS3. National and regional support to clusters play a key role in German innovation policy since the 1990s. Therefore, in many states, RIS3 priorities are similar to those formulated in the regional cluster strategy.

In **Lithuania** the RIS3 is conducted at the national level. The Ministry of Education and Science and the Ministry of Economy and Innovation play the key role as institutions responsible for the S3 process. On a practical level the state-owned Government Strategic Analysis Center (Strata, previously MOSTA) is an advisory body responsible for continuous analysis, monitoring, interim and final impact assessment of the RIS3 implementation. Lithuania still faces a number of challenges, which derive from the soviet past and the neoliberal period after that. Key challenges are low-performing RDI, low productivity and the decision-making system that is still learning the core lessons of governance. Prior to the RIS3, Lithuania had no clear policy focus on innovation and EU structural funding was scattered among various institutions without sufficient coordination. (Lapienis and Reimeris 2016). For Lithuania RIS3 has provided the motivation and methodology to analyse the innovation challenges, identify strengths and start a comprehensive reform of the innovation support system, which is expected to foster economic transformation towards higher value added.

Norway has one of the world's highest incomes per capita, due to its rich endowment of oil and gas, fisheries and aquaculture. However, as a result of a recent decrease in economic growth and rise in unemployment, Norway is now facing the need for structural transformations towards a more diversified and robust economy. In 2014 the Norwegian government launched a comprehensive strategic plan to enhance the contribution of the research and higher education system to boosting innovation and tackling major societal challenges. (OECD 2017). Norway is not an EU member, which means that S3 is not an ex ante conditionality for receiving EU funding. Nevertheless, Norway has adopted the S3 approach in some of its regions. Five regions have also registered on the EU S3 Platform. This could be interpreted as a way of recognising the benefits of S3 as a tool to renew innovation policy and strengthen competitiveness in the regions. (see also Kristensen, Teräs et al 2018).

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[8] https://6aika.fi/en/six-cities/

3.2 SMART SPECIALISATION AND ENTREPRENEURIAL DISCOVERY STORIES OF THE CASE REGIONS

3.2.1 Central Finland

S3 in Central Finland

Central Finland is well-known for a long tradition in forest-based bioeconomy and related research and education. Knowledge in agriculture and forestry, sustainable use of renewable raw materials and the technologies enabling this are identified as the core strengths of the region. Bioeconomy has also the leading role in exporting. Other S3 priorities are knowledge economy, digital economy, wellbeing and tourism with internationalisation as a cross-cutting theme. The RIS3 encourages interaction between the priority areas to create interdisciplinary solutions. (Regional Council of Central Finland 2017).

Central Finland's RIS3 is included in the Regional Programme 2018-2021. Five S3 priorities were selected in an inclusive process with the key stakeholders: e.g. cities, municipalities and research institutions. RIS3 is implemented in close cooperation with these key actors and a clear focus is on bioeconomy. The business sector has been involved as a target group in several projects. The Regional Council is well aware of the projects and participates actively in the project-level discussions. This has resulted in a good awareness of, and connections with, the regional innovation ecosystem and its players. The Regional Council supports also the building of interregional partnerships related to S3 priorities.

RIS3 update

The RIS3 update process will start in autumn 2020. It is foreseen that the priorities will be specified more during the process to strengthen regional identity. There is also a need to improve especially the S3 monitoring and communication of the overall development to the stakeholders. The Biobord Platform (see below project case) will be used to support the RIS3 implementation as well as the interregional cooperation in the field of bioecoomy.

S3 project case 1

RDI2Club: Biobord - Network of Bioeconomy Regions and Innovation Hubs

The BSR Interreg project *RDI2Club*[9] (2017-2020) was designed to boost smart bioeconomy development in the rural areas of the Baltic Sea Region through enhancing the knowledge on bioeconomy strengths and actors of the project partner regions. The five regions of the RDI2CluB partnership are leading bioeconomy regions in their countries: Central Finland, Inland (Norway), Świętokrzyskie (Poland), Vidzeme (Latvia) and Estonia. The project has followed the triple helix approach by involving from each country a public, a research and a business organisation.

RDI2Club-project started by mapping the partner regions and developing their bioeconomy profiles (see Figure 3) including related statistical data (production, employment, turnover, etc.). This required a lot of work from each partner to enable a comprehensive picture of each region's bioeconomy performance, which helps to identify development needs. Based on bioeconomy profiles and SWOT analyses of the regional innovation ecosystems, the partners elaborated regional action plans and a joint action plan.

The collected data from mapping and action plans was fed into the prototype of a webtool called the 'Biobord Platform'. Biobord is a forum that connects bioeconomy business and research actors in the BSR, and provides them with matchmaking services, online events, closed and open groups for project development and news from the network members.

The Biobord has currently 250 registered users (business 23%, public sector 24%, researchers 40% and other representatives 14%). So far the platform has been used for regional and inter-regional project development, planning of study visits, partner search and business matchmaking.

The Biobord has proved to be a very useful tool in RIS3 implementation in the field of bioeconomy, and it is transferable to any other fields. The key requirement is a good groundwork, a committed main coordinator and sub-coordinators in each region. Jyväskylä UAS (Institute of Bioeconomy) is responsible for the overall Biobord coordination and facilitation until 2025. After that the platform and related BSR bioeconomy network would be maintained for example by a license fee for the users.

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[9] http://www.rdi2club.eu/

Figure 3. Regional bioeconomy profile.
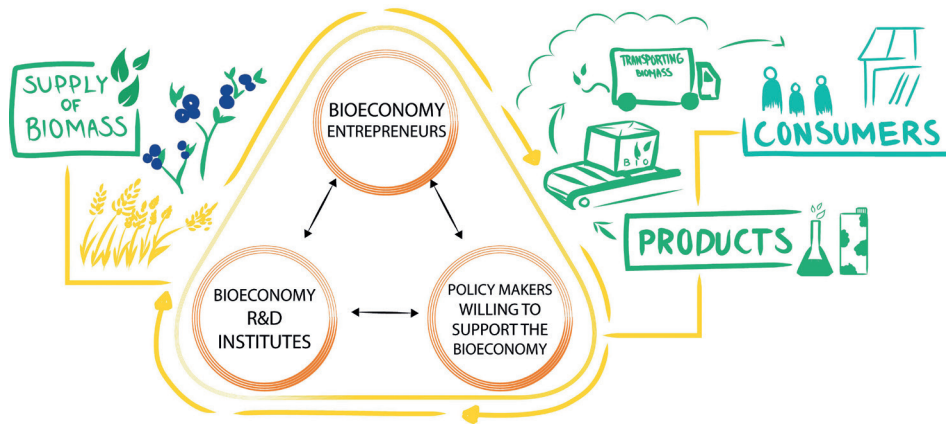
Source: RDI2Club project, Diana Pitkänen 2019.

3.2.2 Hamburg

S3 in Hamburg

The federal state of Hamburg has a strong economy with highly developed clusters. Historically, the economy relied mainly on logistics and trade. Hamburg harbour is still one of the largest employers in the region. Compared to other metropolitan areas in Germany, Hamburg has a comparatively high share of smaller firms and low level of RDI expenditure. The economic development challenges include low labour productivity and a relatively low level of skilled human capital. (OECD 2019).

The innovation policy of Hamburg is based on the 'Hamburg Innovation Alliance' . The Innovation Alliance is a voluntary association set up in 2008 under the coordination of the Ministry of Economic Affairs and Innovation and the Ministry for Science, Research, Equality and Districts of the City of Hamburg. The Alliance has the responsibility to develop and implement a holistic innovation strategy and policy for Hamburg. Currently more than 160 innovation actors are involved including representatives of industry, start-ups, science, NGOs, social entrepreneurs and the administration of Hamburg. Hamburg's Regional Innovation Strategy 2014-2020 was made in line with the eight most important clusters in the fields of life sciences, logistics, aviation, media & IT, renewable energy, healthcare, creative industries and maritime economy. These areas have also functioned as the RIS3 priorities.

RIS3 update

The current updating of Hamburg innovation strategy has involved about 150 stakeholders representing the quadruple helix. The process coordinated by the Innovation Alliance started in September 2019 with a kick-off that provided various stakeholders with the possibility to participate in group discussions on global challenges and their impact on Hamburg's economy and innovation activities. The kick-off was followed by four structured workshops related to education & research, clusters, communication & transparency and funding as well as four actor-specific workshops for industry, science and education, start-ups and the social sector. Several expert interviews, an online survey and a benchmarking study have also influenced the strategy.

The RIS3 updating process has been more complex and time-consuming than the earlier processes, but good planning and professional facilitators have enabled highly valuable interactions between various stakeholders, elaboration of new perspectives on innovation and above all, development of a more cross-sectoral and future-oriented innovation strategy.

The new innovation strategy including RIS3 will be based more on cooperation between the clusters. The RIS3 priorities will be five strategic future fields: health, mobility, energy & climate, new materials and data science & digitalization. The cross-cutting elements include future-oriented investments, skills development and social innovations. The involvement of the social sector is seen as highly important.

Figure 4: One result of an inclusive workshop related to Hamburg innovation strategy and RIS3 update process.
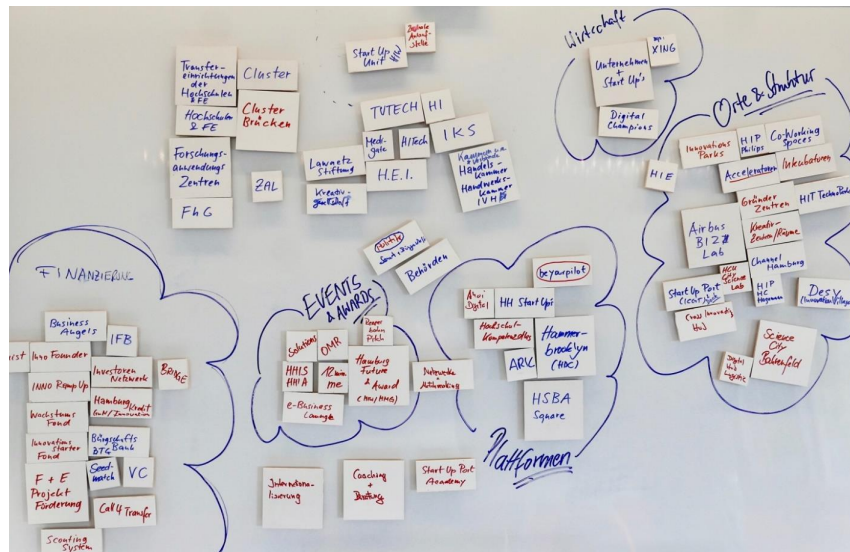
Source: www.da-vinci-team.de

S3 project case 2

GoSmart BSR: Trans-S3 methodology

GoSmart BSR[11] (2017-2021) project with seven partner regions from Germany, Denmark, Poland, Baltic states and Finland is financed by the Interreg BSR Programme with the aim to combine an international dimension with the S3. The project developed a methodology 'Transnational Smart Specialisation Strategy' (Trans-S3)[12] in order to identify common S3 areas with high innovation and internationalisation potentials in different regions and countries. The main idea is to build a basis for smart policy support targeted at the key economic actors, particularly the business sector.

A major challenge in developing interregional cooperation based on RIS3 is that the regional approaches to S3 are policy-driven, limited only to a certain region and not always up-to-date. The Trans-S3 methodology helps to identify objectively shared S3 areas beyond the RIS3 and expand the focus to groups of regions in different countries.

The methodology is based on an exercise of selecting common S3 priorities and refining this selection through appropriate further analyses with participation of the various stakeholders. The process includes five steps:

1. Identify a common set of S3 areas in target regions/countries mainly based on their RIS3
2. Analytical review and profiling of the target territories based on regional/national statistics
3. Market and technology trends review based on statistical data and forecasts, qualitative analysis etc.
4. Assessment of internationalisation potential of priority areas refined during earlier steps based on quantitative and qualitative data.
5. Broad stakeholders consultations according to quadruple helix

The Trans-S3 methodology is considered as one useful tool to develop interregional cooperation within the framework of S3. It is totally transferable across Europe (for those that have RIS3 and related statistical data) and can be adapted also outside Europe. The methodology will be developed further in the recently approved Interreg BSR extension stage project 'GoSmart&Excel BSR' (2020-2021). The purpose of the new project is to produce a transnational S3 document for the Baltic Sea macro-region - to support the BSR strategic framework and BSR regions and innovation actors in prioritising common actions.

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[11] https://gosmartbsr.eu/

[12] https://gosmartbsr.eu/publication/methodology-for-transnational-smart-specialisation-strategy-policy-paper/#more-1339

3.2.3 Helsinki-Uusimaa

S3 in Helsinki-Uusimaa

Helsinki-Uusimaa Region is one of the fastest growing metropolitan areas in Northern Europe. Helsinki-Uusimaa is known for its high level of education, innovative SMEs (high share of patent applications) and investments made in research and development. The utilisation of ICT in completely new sectors is one particular strength of new businesses. In 2019 the European Commission ranked the region in its Innovation Scoreboard study as the most innovative region in the EU.

Smart specialisation is considered as the most important driver of innovation in the region. A high emphasis is put on co-creation, good governance and strategic EU cooperation. The previous RIS3 had four multidisciplinary S3 priorities: 1) urban cleantech, 2) health and wellness, 3) digitalising industry and 4) citizen city. For example urban cleantech includes energy efficiency, circular economy, bioeconomy and consumer cleantech. Citizen city includes wellbeing and participation of citizens. (Helsinki-Uusimaa Regional Council 2015).

RIS3 update

The new RIS3 (2021-2027) titled 'Resource wise Helsinki-Uusimaa' was finalised in April 2020 after a one-year process including regional analysis and workshops with key stakeholders. The key drivers of the RIS3 process were analyses of major megatrends (ageing population, climate change, globalisation, digitalisation) and the UN goals for sustainable development that have a strong influence on current EU policy priorities (e.g. EU Green Deal, carbon neutrality goals). The new S3 priorities are three broad themes 1) carbon neutrality (e.g. circular- and bioeconomy), 2) city of people (e.g. smart mobility and living), 3) renewing industry and services (e.g. robotics and tourism). (Heiniemi-Pulkkinen and Juselius 2020).

With its new RIS3, Helsinki-Uusimaa aims to keep its place as Europe's leading innovation area by being among the top EU resource wise regions and through active EU cooperation. The region aims to motivate big companies (e.g. energy and transport) in S3 implementation as they are the major players in reaching carbon neutrality goals. Also citizen involvement in co-creation and pilot projects is emphasised. Helsinki-Uusimaa aims to increase its participation in the EU S3 Platform and EU thematic networks. The region is a partner in the 'safe and sustainable mobility' partnership of the Industrial Modernisation thematic platform. The RIS3 document mentions strategic cooperation with large European cities (so-called Big Five network: Helsinki, Amsterdam, Hamburg, Copenhagen and Stockholm).

The international communication around S3 is compiled under the Helsinki Smart Region brand facilitated by the Regional Council. The brand has been a successful way to communicate the achievements of S3 regionally and internationally.

S3 project case 3

Smart-Up BSR: Innovation Camp

BSR Interreg project *Smart-Up BSR* (2017-2020)[13] involved partner regions from nine countries (Finland, Estonia, Latvia, Lithuania, Germany, Denmark, Sweden, Poland and Russia). The project fostered needs-driven innovation processes and RIS3 implementation in the regions by organising innovation camps with interregional participation of experts representing the quadruple helix. The Smart-Up camps focused on finding innovative solutions to identified challenges related to healthy ageing, climate change, circular economy and smart city.

For example the innovation camp in Riga with 100 participants was organised in February 2020 in connection with a major conference on innovation. The camp included five challenges formulated by challenge owners - two ministries and two universities in Latvia. Some challenges were broad (e.g. "long-term cooperation between business, academia and public sector to foster innovation") and some more narrow (e.g. "use of the innovative digital approaches to educating the public in the circular economy"). The participants from different BSR regions worked around the challenges with support from professional facilitators.

Smart-Up BSR innovation camp method has enabled a versatile group of experts from different BSR countries to come together and find solutions to regional and interregional challenges. As a result, the challenge-owners and participants have gained practical solutions, learning and relevant networks related to S3 topics for future cooperation.

Crucial elements of this interregional practice include strong engagement of key persons responsible for RIS3, suitable facilitation methods, professional facilitators and the selection and formulation of the challenges to be relevant and broad enough. The challenges must be real and the challenge owners must have a high motivation to find solutions to the challenge. Successful camps require external funding for extensive preparation work and travel costs. A good solution is to organise the camp in connection with a relevant international event. The method is useful in any interregional cooperation as it enables not only deeper learning and trust building, but also identification of shared interests and cooperation opportunities.

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[13] https://smartup-bsr.eu/

3.2.4 Lithuania

S3 in Lithuania

Lithuania started to develop its innovation policy after joining the EU in 2004. Since the 1990s until mid-2000 the country was governed by very neoliberal policy makers who believed that science-business cooperation will flourish naturally and any efforts of economic long-term planning are remnants of the Soviet past and should be abandoned. Prior to RIS3, Lithuania still suffered from the lack of strategic planning and policy coordination, which led to the financing of all the economic sectors and research fields and to the strengthening of the traditional manufacturing economic sectors. Lithuania's export market is still dominated by low-tech and mid-tech production. (Lapienis and Reimenis 2016).

The state-owned agency Strata (previously MOSTA) is responsible for RIS3 in Lithuania. The agency started the RIS3 process by engaging international experts and carrying out a detailed analysis of the country's research, higher education and business potential. The process included a national survey and panel discussions with 100 key scientists, companies and public sector representatives. (Lithuanian RIS3: How it was designed. 2016). The identified core strengths of Lithuania are high quality human resources and a business-friendly environment. Science and business cooperation is strong especially in the following sectors: life science industry, photonics and lasers and material sciences.

RIS3 update

The first RIS3 approved in 2015 had six priority areas[14] with 20 specific priorities. The interim evaluation took place in 2019 including over 40 workshops involving 130 participants from research and business fields[15]. As a result, the new RIS3 will have only 3 priorities: 1) health and biotechnologies, 2) advanced manufacturing and materials, 3) ICT. More cross-sectoral approaches will be allowed in the project selection. It was also decided that full-time coordinators for each S3 priority will be nominated to ensure a better governance and regular EDP. The S3 coordinators will organise events and take care of international networking and constant communication with stakeholders, funding agencies and ministries.

The RIS3 process has encouraged Lithuania to start a comprehensive innovation reform process that aims to improve innovation governance with clear responsibilities for one ministry and one agency, revise the innovation support system and improve conditions for R&D-oriented FDI. Lithuania is also an active participant in various activities of the S3 platform with the aim to learn and share experiences.

S3 project case 4

ClusterFY: Interregional cooperation between clusters and business networks

ClusterFY[16] (2017-2021) is an Interreg Europe project that aims to improve regional and national policy instruments seeking to intensify Key Enabling Technologies (KETs[17]) -related interregional cooperation between clusters and business networks. KETs are central to strengthening Europe's capacity for industrial renewal and innovation. The EU's previous Industrial Policy Strategy (2017) highlights ongoing efforts to strengthen cluster policy excellence in order to make better use of clusters as a strategic tool of industrial policy and support industrial innovation on the ground. In many European countries and regions, clusters also play a key role in implementing the regional innovation strategies.

The ClusterFY project has produced action plans and joint policy recommendations to improve European cluster policies. Although cluster initiatives are often seen as focusing on innovation and growth in firms, cluster policy also aims at influencing the system: bringing together triple helix actors to address broader regional and national aims for skills development, entrepreneurship, digitalisation, industrial modernisation, internationalisation and sustainable development. Clusters are crucial in the creation and promotion of innovation and can be seen as catalysts for structural change.

One important result of ClusterFY is the establishment of an innovation platform in Groningen, Netherlands to facilitate and coordinate cooperation between European clusters and business networks. The platform is financed by the Northern Netherlands Alliance (SNN), a managing authority for the ERDF OP for the Northern Netherlands.

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[14] S3 priority areas during 2014-2020 were: 1) Energy and sustainable environment, 2) Health and biotechnologies, 3) Agri-innovations and food technologies, 4) New production processes, materials and technologies, 5) Transport, logistics and ICT, 6) Inclusive and creative society.

[15] https://s3platform.jrc.ec.europa.eu/smart-stories

[16] https://www.interregeurope.eu/clusterfy/

[17] KETs are technologies that are considered vital in supporting European industries to retain competitiveness and capitalise on new markets. The KETs include for example advanced manufacturing, nanotechnologies, advanced materials, biotechnology and artificial intelligence.

3.2.5 Mecklenburg-Western Pomerania

S3 in Mecklenburg-Western Pomerania

Mecklenburg-Western Pomerania (MW) is a federal state in the Northeast Germany bordered by federal states of Schleswig-Holstein, Lower Saxony and Brandenburg. After reunification of Germany, MW has faced a number of structural changes such as major population loss resulting in being the least densely populated region in Germany. The innovation challenges relate to comparatively low levels of RDI investment. The region has a strong agricultural and maritime tradition resulting in a continued importance of food industries. Other important sectors are industry 4.0, mechanical engineering, maritime technology, automotive and aviation, renewable industry, logistics and ports, life science, timber/plastics and tourism.[18]

The RIS3 managing authority is the State Ministry for Economic Affairs, Construction and Tourism. In 2010 the Ministry established the so-called 'strategy council' that includes representatives of Chambers of Commerce, universities and leading industry organisations. The strategy council coordinates the design, implementation and monitoring of regional innovation strategy and RIS3. It has also nominated working groups and coordinators for each S3 priority. The Regional Innovation Strategy 2020 for Mecklenburg-Western Pomerania including RIS3 was published in 2013. The current S3 priorities are 1) Mechanical engineering and construction; 2) Health Care and Life Science; 3) Energy and Climate 4) Nutrition 5) IT and 6) Mobility.

The MW approach to RIS3 is highly industry and technology oriented. The involvement of civil society is rather negligible. The main aim of RIS3 is to provide a better basis for developing MW as a location for technology through e.g. investing more funds in applied sciences serving SMEs.

RIS3 update

The MW RIS3 update started at the end of 2019. The Ministry has contracted an external expert - the Fraunhofer Institute - to draft the new RIS3 based on interviews with S3 priority coordinators and analysis of the development needs. The major future-oriented specific themes that emerged during the RIS3 update include ocean technology, hydrogen and renewable energy, which have recently succeeded in receiving notable national and EU-funding for significant investments in RDI and test fields.

S3 project case 5

EmpInno: interregional learning and business matchmaking trips

The Interreg BSR financed project EmpInno (2016-2019)[19] has aimed at improving S3 delivery by 16 partners in 13 partner regions: half of the partners were RIS3 managing authorities, while the other half were innovation intermediaries, e.g. business development organisations. EmpInno focused on how to involve the business sector to better utilise the opportunities provided by RIS3 frameworks. The project organised several workshops and transnational discussions related to S3 themes and formulated recommendations to managing authorities on how to improve their RIS3 performance for the benefit of the business sector. This was considered as a good way to learn from other regions.

As a key activity, the EmpInno project implemented several interregional business matchmaking trips for SMEs. Each trip focused on a certain shared S3 topic such as maritime industries, food, energy and ICT. For example a business matchmaking trip to Seinäjoki, Finland was organized with a focus on the food sector. The trip was organised in connection with an international food fair. Prior to the trip, each partner region undertook an analysis to identify potential companies and sub-sectors that would benefit from the event. The trip included a workshop and a business matchmaking event. A precondition for a successful trip was comprehensive preparation work to reach and attract the most relevant companies with the potential to benefit from the interregional matchmaking. For this an open call and several discussions with the companies were organised.

EmpInno has received funding for an extension stage. The new project EmpInno Monitor S3 (2019-2021)[20] focuses on improving the RIS3 monitoring systems via enabling e.g. more efficient stakeholder feedback with the help of e.g. digital tools.

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[18] https://www.invest-in-mv.de/en/industries/industries

[19] https://old.empinno.eu/

[20] https://empinno.eu/
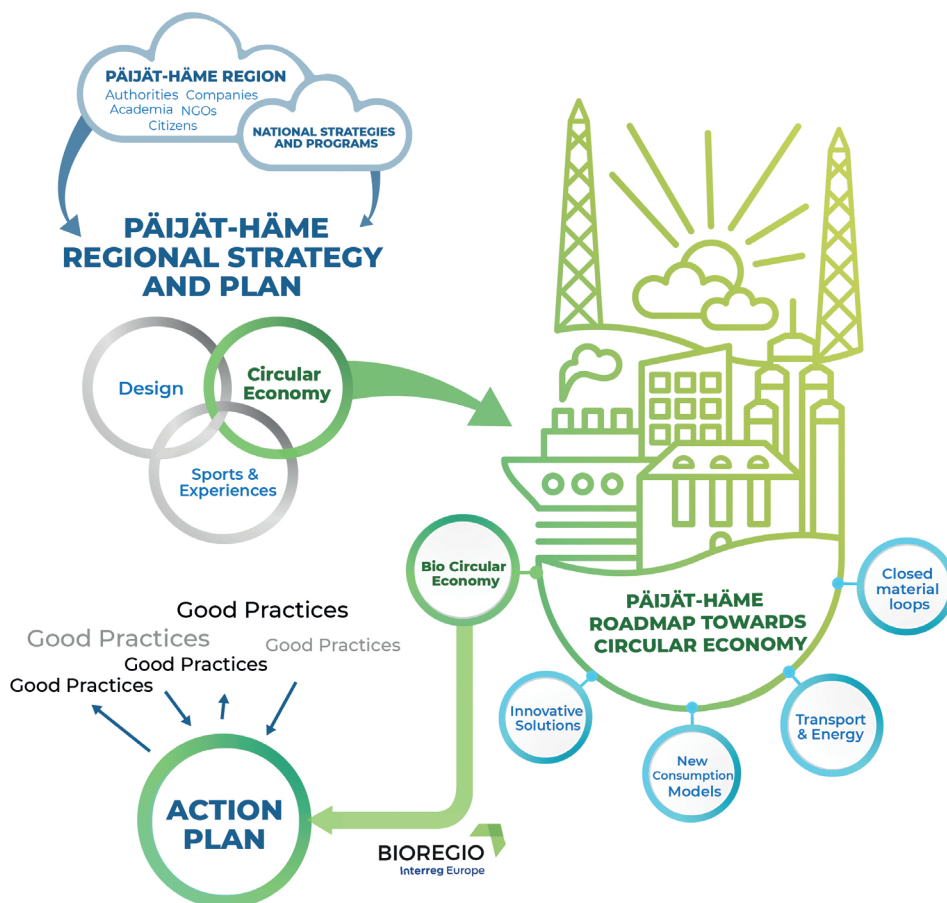
3.2.6 Päijät-Häme

S3 in Päijät-Häme

Päijät-Häme Region has a versatile economic structure that is based on a strong industrial background. After major structural changes, manufacturing of furniture, drinks, clothing and rubber products still play a big role in the region's economic structure. The high share of SMEs provides flexibility in adapting to structural changes, but the versatility causes certain challenges to specialisation. Originally cleantech, user-driven innovation, design and wellbeing were selected as the S3 priorities. Later the S3 priorities were modified as circular economy, design and sports & experiences, which are mentioned in the Regional Programme 2018-2021.

The EDP in Päijät-Häme is based on designing roadmaps and action plans for each S3 priority as well as regular stakeholder group meetings (see Figure 5). The first roadmap was made for circular economy in 2017 as part of a regional ERDF project coordinated by Lahti University of Applied Sciences (UAS). The roadmap was created through an intensive process including workshops and discussions with the Regional Council, other regional and municipal authorities, univer-

sities, as well as public and private companies. The roadmap includes a vision - "Päijät-Häme – the successful resource efficient region" - based on five thematic fields with regional goals and actions under each subfield. The roadmap process is considered successful and it has gained visibility at national and EU-levels.

The roadmaps for each S3 priority are regularly updated in stakeholder group meetings (3-4 times/year) with stakeholders from business, academia and the public sector. The business sector is represented mainly by business development and cluster organisations that represent single companies. The meetings enable exchange of experiences, project planning and synergies between key stakeholders related to the S3 priority in question. A key issue is that the Regional Council facilitates the meetings, takes care of involving various stakeholders and defines clear responsibilities to different stakeholders in the roadmap implementation. The Council covers part of this work with the ERDF. Also the action plans are implemented to a major extent by the ERDF.

Figure 5. Päijät-Häme model of RIS3.

Source: BIOREGIO project, Oona Rouhiainen 2018.

RIS3 update

Päijät-Häme is currently updating its RIS3 and started the process through organising two workshops and conducting a questionnaire to stakeholders in early 2020. The process has involved nearly 100 persons. Through its EDP, the region has established a need to improve monitoring and identify the core knowhow within the S3 priorities to enable stronger specialisation in such specific fields that have value also on the international level. Päijät-Häme has noted that it also needs to boost the attraction of more national and EU-funding for research and innovation.

The Päijät-Häme model of roadmaps for S3 implementation is transferable to any field and region. The key requirements are the commitment and facilitation skills of the regional authorities as well as the ability to identify key stakeholders in each S3 priority field. The challenges of this model include the risk of domination by a few stakeholders and the risk of overlooking the potential for cross-sectoral cooperation and linkages between stakeholders representing different S3 priorities.

S3 project case 6

BIOREGIO: Action Plans towards Bio-based Circular Economy

Interreg Europe project BIOREGIO[21] involves six European regions from Finland (Päijät-Häme), Spain, Slovakia, Romania and France to improve policy instruments supporting the move towards a bio-based circular economy. The project has enabled regional learning and designing regional Action Plans with a focus on the bio-based circular economy.

In Päijät-Häme the Action Plan supports the implementation of the key S3 tool Päijät-Häme Roadmap towards Circular Economy. The Action Plan was elaborated in 2018 in cooperation with the regional stakeholder group on circular economy.

Päijät-Häme Bio-based Circular Economy Action Plan has four actions. These include establishment of agricultural biochar, promoting a separate collection of biowaste in residential areas with single-family homes and development of bio-products and bioenergy use. The fourth set of actions aims to strengthen the role of Päijät- Häme as an international reference area for the circular economy. The actions are financed primarily through the ERDF and the Action Plan has a strong influence on project funding criteria.

The added value of BIOREGIO has been the learning from other European regions with a RIS3 focus on the circular economy. Several partner regions also adopted the roadmap method based on the Päijät-Häme model. Lessons learned in and interregional connections of BIOREGIO are utilised in the S3 updating process in Päijät-Häme and other partner regions.

3.2.7 Tampere Region

S3 in Tampere Region

Tampere Region (Pirkanmaa) is an important industrial centre and by population the second largest region in Finland. The industrial tradition is based on textile and shoe industries, later pulp and paper industry and technology industry. The current strong fields are mechanical engineering and automation, ICT and health and biotechnology. Also the experience economy and circular economy are growing sectors. The modernising of traditional industries and development of new high-tech industries through investing in R&D and education have been the key drivers of economic transformation. An important strength is also the long tradition of research-business cooperation and cooperation across sectors. (Tampere Chamber of Commerce 2019).

The Pirkanmaa Regional Development Program 2018-2020 is called 'Bolder than before!' It has continued to explore alternative future scenarios through background analysis and workshops with key actors in the region. As a result, four development entities were selected: 'bright, integrated, sustainable and accessible Pirkanmaa' that further refine the S3 priorities: 1) digital manufacturing, 2) smart city solutions, 3) circular economy, 4) wellbeing and health services and systems. The Tampere Region RIS3 emphasises especially the new ways of collaboration, such as open innovation, multidisciplinary innovation platforms and collaborative foresight activities as ways to support specialisation and renewal capacity. (Council of Tampere Region 2017).

The monitoring of innovation activities in Tampere Region is acknowledged as European good practice.[22] The so-called 'Situational Picture of Innovation' is based on open data and materials provided by the region's main innovation actors (regional council, municipalities, chamber of commerce, Business Tampere, universities, companies and start-ups) that are collected and visualised in one picture (Figure 6). The knowledge base of the situational picture is updated annual-

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[21] https://www.interregeurope.eu/bioregio/

[22] https://www.interregeurope.eu/policylearning/good-practices/item/460/situational-picture-of-innovation/

ly. It includes some 50 indicators under six main themes: value network capability, company growth, RDI funding, higher education institutes, digitalisation, and internationalisation. Interpretation workshops with stakeholders and experts are crucial for achieving accurate analysis and related evidence behind the data. The main challenges link to acquiring better up-to-date data, but the process supports well joint vision building among the main actors and therefore supports the EDP.

Figure 6. Situational picture of innovation in Tampere Region 2019.
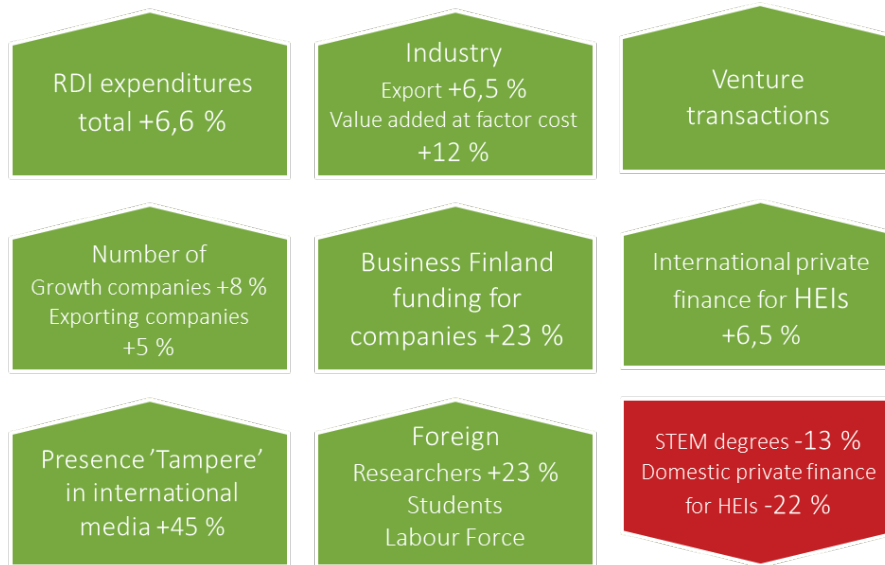
Source: Council of Tampere Region.

The situational picture of innovation has so far not directly followed the S3 development, but the Council of Tampere Region is currently involved in an IE project that aims to collect data on S3-related R&D infrastructure. This data is planned to be visualised and added in the situational picture. This is related to overall vision of the proposed interregional innovation investment - I3 - mechanism for post-2020, which supports improved access for scientists and companies to Europe's best available research infrastructure, irrespective of borders. Availability of analogical data concerning the performance of S3-related R&D infrastructure in different regions could support the identification of complementarities and need for interregional investments to create joint RDI infrastructures.

RIS3 update

Tampere Region will start the updating process of their regional development programme including RIS3 in autumn 2020. The process will involve the main innovation actors of the region according to a Triple Helix approach. Pirkanmaa S3 choices are deeply rooted in regional strengths and related research. They are not likely to be changed, but expected to be sharpened. It is also expected that strong emphasis will be given to carbon neutrality and social sustainability in all sectors. The innovation monitoring system (situational picture of innovation) will also be added with sustainability indicators. The aim is to create a RIS3 that provides flexibility for the stakeholders. The Pirkanmaa RIS3 continues to underline agile modes of cooperation, rather than lock in specific economic sectors. Pirkanmaa is a member of the EU thematic network related to industrial renewal - the Vanguard Initiative[23].

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[23]   https://www.s3vanguardinitiative.eu/

S3 project case 7

S34Growth: Interregional cooperation based on a European thematic network on industry renewal

S34Growth[24] (2017-2019) is an Interreg Europe project in which 10 European regions[25] have developed new and improved existing regional policy instruments with the key aim to enhance more strategic industry-led interregional cooperation, supporting industrial renewal in Europe.

The S34Growth partnership is based on a large network of EU industrial regions - the Vanguard Initiative - through which the S34Growth partners have been pioneering a new approach to interregional cooperation since 2013. The Vanguard methodology (learn, connect, demonstrate, commercialise) consists of regional stakeholders learning from each other, connecting innovation organisations and activities, and moving on to interregional demonstration projects, through joint investment and with the ultimate goal of improving product and service development processes. The approach has been largely recognised and upscaled as a model for EU policies, notably through the Thematic S3 Platforms.

The S34Growth partners developed action plans related to e.g. interregional innovation vouchers and partnerships and ERDF-funded parallel projects in different regions. It was crucial that the partners were organisations responsible for the RIS3 in their regions and they continue the cooperation and trust building after the project as members of the Vanguard Network. A key element was also the successful engagement of many relevant industry sector stakeholders in the S34Growth study visits and other activities. The proposed I3 instrument noted above was influenced by the project and the work of the Vanguard Initiative.

3.2.8 Trøndelag

S3 in Trøndelag

Trøndelag is a region of 400 000 inhabitants in Central Norway formed by the remerging of Nord-Trøndelag and Sør-Trøndelag in 2018. The main city is the City of Trondheim, the third largest city in Norway and a major centre for higher education. Trøndelag, like Norway in general, faces a major challenge to develop sources of growth and added value other than the resource-based oil and fishing industries, which have contributed to its wealth for the past century and still do. This success has - until the 2000s - overshadowed the need for more knowledge-based development (OECD 2006). Trøndelag has since made efforts to e.g. reform the system of R&D support for the benefit of industrial renewal and innovations. (OECD 2017a).

The Norwegian University of Science and Technology (NTNU) and the Foundation for Scientific and Industrial Research at the Norwegian Institute of Technology (SINTEF), the largest independent research organisation in Scandinavia, form the core of the Trøndelag innovation approach. The NTNU and SINTEF interact with large enterprises at national and international levels through a multiplicity of channels, e.g. student mobility between the university and industry. (Sotarauta, Dubarle et al 2006).

As Norway is not an EU-member, the Norwegian regions receive innovation-focused funding from the national government. This includes direct support to the business development and clusters through Innovation Norway and funding for e.g. business-research projects through the regions. In general, the national and regional development funding is highly business-oriented.

The European RIS3 policy concept is treated positively by the Norwegian government. It is in line with the national laws and some Norwegian regions (e.g. Nordland and Trøndelag) have already adopted it in their regional strategies according to guidelines provided by the national government. Trøndelag organized discussions and workshops with public, business and research actors as well as a public hearing, and finalized the RIS3 in 2017 and action plans for each S3 priority in 2018. The strategy includes five pillars: circular economy, bioeconomy, marine sector, smart societies and experience economy that provide the focus areas for the regional funding.

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[24] https://www.interregeurope.eu/s34growth/

[25] S34Growth partner regions: Pirkanmaa, the Basque Country, Catalonia, Flanders, Lombardy, Norte, Scotland, Skåne, South Holland, and South Netherlands

BSR Stars S3: Developing innovation ecosystems within circular economy

Trøndelag has been actively involved in BSR cooperation and EU Interreg projects for many years, which has been an important way to learn from and exchange experiences with EU regions. A BSR Interreg project BSR Stars S3[26] (2016-2019) focused on fostering inter-regional learning and activities in the S3 field of circular economy. The well-prepared and focused study visits organised during the project improved the understanding of the circular economy potential among the Trøndelag stakeholders, enhanced an industrial thematic network in the BSR and inspired Trøndelag to establish a business park - THAMS Industrial Cluster[27] - based on industrial symbiosis. Regional public-research-business matchmaking events enhanced the circular economy stakeholder engagement.

3.2.9 Västerbotten

S3 in Västerbotten

Västerbotten is - by area - the second largest region in Sweden. The region is sparsely populated and located more than 500 km North of the capital, Stockholm. Västerbotten is part of the Northern Sparsely Populated Areas (NSPA) Network together with Northern regions of Norway and Finland, and is characterised by typical challenges of peripherality and old industrial communities. The NSPA regions have unique geographical characteristics - low population density and a harsh climate - and face specific challenges due to strong natural resource endowments, an ageing population, long distances from markets, and high-cost land transport. Västerbotten's challenging context nevertheless enables opportunities for innovation e.g. in technical solutions for infrastructure and communication networks over long distances. (OECD 2017b).

Västerbotten's economy is strongly based on forest industry and mining, but today high-tech processing industries, energy and cleantech, life science, ICT, and service industries play an important role. The most important strength is a high level of knowledge and skills, with three universities as well as active involvement in Arctic and BSR cooperation. Västerbotten is part of "North Sweden Regional Innovation Partnership" that includes the regions of Västerbotten, Norrbotten, Jämtland-Härjedalen and Västernorrland - the four northern regions in Sweden - with the aim to initiate joint projects and make Northern Sweden more competitive and visible in the global market. Västerbotten cooperates with other NSPA regions e.g. in an Interreg North project that aims to identify joint inter-regional investment needs for industry and develop an Arctic Investment Platform (AIP) - a joint funding system to boost the investment capacity in the NSPA regions. Umeå university is part of the Arctic Five - an alliance with The Arctic University of Norway, Luleå University of Technology, The University of Lapland and The University of Oulu - that aims to share knowledge, education and research infrastructure for the development of the Arctic region and its businesses.

The Innovation Strategy for Västerbotten 2014-2020 stresses the importance of methods and tools to strengthen innovation throughout the region by investing in the creativity and creative power of actors who are not easily found in already established innovation systems. The current S3 priorities are innovative healthcare; life science; technology and service in the industry; testing activities; sustainable energy and environmental engineering; experience industries and cultural and creative industries; and digital services.

The design and implementation of Västerbotten's RIS3 can be described as a learning process. The integration of S3 in the OPs was a late exercise which impeded stakeholder involvement and well-consulted decisions. There are many S3 priorities and the implementation has not been very systematic. Therefore, the Regional Council has been actively involved in inter-regional learning, and has started recently an ERDF-financed innovation management project that aims to create an internal structure and organization for coordinating innovation ecosystems, creating a more systematic approach and monitoring of RIS3.

RIS3 update

The RIS3 updating process will start in the autumn 2020. It is expected that fewer S3 priorities will be selected and sustainable innovations will have a more prominent role. During implementation, the aim is to create action plans and nominate coordinators for each S3 priority. Västerbotten aims to utilise RIS3 in broadening the industrial value chains from manufacturing to finalised products. The region will continue the political and strategic cooperation with other regions in the Arctic and Europe with the aim to identify joint innovation interests and develop an innovation-oriented financial framework enabling joint investments.

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[26] http://www.baltic.org/project/bsr-stars-s3/

[27] https://www.thamsklyngen.no/

LARS: Triple-helix gap analysis

The LARS - Learning Among Regions on Smart Specialisation -project (2017-2020) is financed by the Interreg BSR Programme with the aim to support the partner regions in managing their S3 processes. The project has utilised the so-called 'Triple-helix gap analysis' methodology to find deficiencies as well as good cases of innovation ecosystems in the partner regions. The methodology has been developed by the University of Vaasa. Furthermore, each partner region has selected one good practice from other regions suitable for their needs and to be piloted.

In practice, the LARS partner regions selected value chains that play a vital or emerging role in their RIS3 implementation, analysed connectivity and functioning of those value chains, and organised stakeholder meetings to discuss findings through structured dialogues. For example, Region Västerbotten selected sustainable energy and the environmental technology sector and organized 17 interviews and further meetings with the stakeholders representing the quadruple helix. As a result, a description of the regional value chain was made.

The method was considered rather complex as the questionnaire was long and to some extent difficult for the stakeholders. One weakness of the data is that it is based on subjective evaluations of the interviewees regarding expectation and experience of the relationship and importance of the partner. Therefore, more attention should be paid to adapt the questionnaire to the regional specifics and make it neutral as well as less complex for the stakeholders. Despite the challenges, the method was found useful for the informative discussions with the stakeholders and identifying the gaps. In Västerbotten, good connections between companies and universities were identified and the biggest gap was found in the collaboration between companies and regional public organisation. The LARS analysis provided one method to interpret reasons behind the strengths and gaps in regional value chains.

4. Analysis of the S3 approaches and interregional cooperation

4.1 CASE REGIONS' APPROACHES TO S3

Each regional S3 story described in the previous chapter is unique. The different economic structures and innovation policy of the countries and regions influence the nature of S3 approaches. The following three broad S3 approaches described on the next page (see Table 1) have emerged based on the interviews of this study. They are not mutually exclusive and regions might have adopted elements from several approaches. The purpose of this division into three approaches is to help regions to identify the key elements and potential benefits and challenges of their approach.

Table 1. Three S3 approaches and regional case examples identified based on the interviews.

1. Methodological approach: Use of specific methodologies to support the EDP process	
Benefits	**Challenges**
• Provides opportunity for more systematic analysis of the innovation ecosystems and stakeholders • Can provide comparable data concerning S3-related innovation ecosystems to support strategic interregional cooperation, if the same methodology is used by various regions	• Can be inflexible and complicated if not sufficiently adjusted to regional specificities and specific stakeholder groups
Examples	
Region Västerbotten utilised the methodological approach in their Interreg BSR LARS project to support the EDP. As a result, the regional authority received more comprehensive knowledge on the stakeholders and innovation value chains to be utilised in the RIS3 update and S3 process, but there were challenges with the inflexibility of the methodology. The use of methodologies should be well planned and modified to regional specifics. Special attention should be paid on the language and communication with stakeholders.	
2. Policy-driven approach: S3 is used as a tool to reach policy aims, such as stronger uptake of regional/national mechanisms to support e.g. FDI and RDI	
Examples	
Lithuania and Norway have fairly young innovation policies. Their RIS3 processes can be interpreted as policy-driven as they have utilised RIS3 in the first place to renew their innovation policies. The S3 process has provided them with tools and methods, which have enabled them to identify their core strengths for the first time. The policy-driven approach is rather a top-down approach and the engagement of various stakeholders is crucial for the success of further S3 process.	
Benefits	**Challenges**
• Useful approach for countries with young or outdated innovation policies, governance and processes • Significant structural changes in the innovation support system can improve the innovation environment and help identify the core strategic fields for interregional cooperation	• Challenging to engage various groups of stakeholders • Risk of domination by a few stakeholders leading to lock-in of certain themes or industry sectors
3. Structure-driven approach: RIS3 is strongly based on earlier identified regional strengths and new ideas arising from the stakeholders might be added to this baseline	
Examples	
1) Central Finland's long tradition of triple helix cooperation and knowledge-base in forest industry modernisation and agriculture has provided an excellent basis to focus on bioeconomy as S3 priority. This structure-driven approach to S3 has been elaborated with cross-sectoral links with other S3 priorities and S3-related international cooperation. 2) Tampere Region has built RIS3 largely on the foundations of 1990s National Centre of Expertise programme and local/regional programmes. 3) In Hamburg the RIS3 priorities were first selected in line with the strongest clusters following largely the structure-driven approach. The wide stakeholder engagement according to quadruple helix during the RIS3 update provided new ideas and has enabled significantly more cross-sectoral and future-oriented approach. The active interaction with various stakeholder groups and efficient identification of new stakeholders is vital for the further development of S3.	
Benefits	**Challenges**
• Good knowledge on own strengths and long tradition of regional cooperation • Strong regional identity • May provide good basis for developing strategic interregional partnerships	• High reliability on earlier identified strengths and stakeholders' capacities might hinder the learning process and identification of emerging specific areas

4.2 EDP IN THE CASE REGIONS

Now the regions are preparing for the next EU financing period (2021-2027), and must update their RIS3 in line with EC guidance and updated regional needs. Helsinki-Uusimaa has already finalised their new RIS3 this year. Central Finland, Päijät-Häme, Hamburg, Mecklenburg-Western Pomerania and Lithuania are currently finalising their strategy updates. Tampere Region and Västerbotten will start their updating processes in autumn 2020. In general, the case regions aim to improve the priority definitions to allow **focus on core strengths and provide more room for cross-sectoral activities. Resource efficiency and carbon neutrality** are now adopted more as leading principles in most of the RIS3 strategies. The role of **social innovations** is getting more attention as well.

In comparison to the earlier RIS3 design, the regions appear to have **increased efforts towards wider stakeholder involvement.** However, the practical utilisation of the quadruple helix principle still remains vague and is adopted only in a few regions. The Hamburg RIS3 update is a good example of a structured and open process that engaged various stakeholder groups, including several NGOs. Some regions plan to utilise quadruple helix principles, while a most regions clearly do not find enough added value in including different stakeholder groups into RIS3 design. The cultural and historical context plays also an important influencing role in this matter. Lithuania is currently not involving the social sector at all and Mecklenburg-Western Pomerania follows a highly industry-need-led approach to stakeholder involvement. Here the key question for the regions is **how to approach and motivate different groups of stakeholders to be involved in the EDP so that it brings concrete added value to all parties and to the region as a whole.**

The most common approach seems to be that the **quadruple helix is realised rather more in the RIS3 implementation than in the RIS3 design.** Some regions, such as Västerbotten and Hamburg aim to have social innovations as a core element in their RIS3. Helsinki-Uusimaa has a special approach to quadruple helix in RIS3 implementation by selecting a participation-oriented "city of people" as one S3 priority interlinked with other broad S3 priorities (carbon neutrality and renewing industry&services).

Major challenges of EDP are related to communication with the different types of stakeholders and ways of coordinating the participation and discussions so that each stakeholder group can identify their potential role in relation to other stakeholder groups, and so that one stakeholder group does not dominate too much the whole process. Equally, lengthy and complex consultation approaches linked to the EDP can be difficult to manage and can be costly to administer. Therefore, **investments in skills and human resources are required for an efficient use of EDP.** A good practice of the S3 communication is the Helsinki Smart Region brand facilitated by the Regional Council. The brand has been a compact and fluent way to communicate the achievements of RIS3 regionally to various stakeholders (including the civil society), nationally as well as internationally.

According to interviews, the **regions are increasing their efforts on RIS3 governance and monitoring,** leading towards more sophisticated approaches to EDP. For example Västerbotten has started a project with the aim to improve the RIS3 governance and create a more systematic approach to RIS3 implementation and EDP. Päijät-Häme has already developed a systematic approach that includes creation of roadmaps and concrete action plans for each S3 priority as well as regular stakeholder group meetings to update the roadmaps and ensure the continuous EDP. The benefit of the Päijät-Häme model is the regular interaction between stakeholders and concrete action plans to support the efficient use of EU-funding. However, this model includes higher risks of inflexibility and domination by a few stakeholders.

An interesting example of innovation monitoring is the data-based tool 'situational picture of innovation' - created by the Council of Tampere Region. The tool is updated every year and it enables a combination and visualisation of key innovation-related data from various sources of the main stakeholders. **This points to new directions for EU regions in generating improved innovation evidence through digital tools and open data, to support the regional EDP.** The crucial elements are the availability of data and justified selection of relevant indicators that respond to specific needs and trends. Now Tampere Region aims to develop this monitoring tool further to include also indicators related to the performance of R&D infrastructure within different S3 priorities.

A key issue in all these EDP cases of RIS3 design, governance and monitoring is that the organisation responsible for RIS3 facilitates the meetings and adopts a neutral management approach to involving various stakeholders. This **requires specific facilitation skills and the ability to find ways to engage different stakeholder groups.** The domination by a few stakeholders and pressures to work with the same stakeholder representatives - the 'usual suspects' - is a typical challenge in all EDP cases. For example Hamburg and Helsinki-Uusimaa have committed to solve these challenges during their RIS3 update by commissioning analyses of global megatrends and discussing their influence with different stakeholder groups. This supported the regions to upgrade their S3 priorities in line with both the EU direction and demand from the innovation stakeholders. Hamburg invested in its RIS3 update process by hiring external facilitators and putting more effort into engaging stakeholders who were not previously involved in RIS3. These make the EDP more complex but provide benefits in the long term.

4.3 LEARNING AND EXPERIENCES FROM THE S3 INTERREG PROJECTS

S3 Interreg projects have mainly been about **sharing, learning and exchanging on S3 practices with the aim of improving domestic practices and policies.** In addition, a few projects have been able to build S3-related networks (RDI-2Club and BIOREGIO), some have developed and piloted methods to strengthen regional S3 (LARS, EmpInno) and interregional S3 (GoSmart BSR), while others have focused on joint S3-releated challenges and organised well-prepared

study visits and interregional innovation camps to find new perspectives and solutions to those challenges (SmartUp BSR and BSR Stars S3). There have also been projects which have adopted a strong influencing towards shaping future EU-level policies regarding interregional S3: ClusterFY promoting the role and interregional cooperation of clusters and business networks regarding S3 and S34Growth which has influenced the direction of the proposed I3 instrument for the post-2020 period. The experiences from these projects provide valuable knowledge for the future development of interregional S3 and offer rich learning insights for other regions.

The interviews highlighted the **importance of systematic meetings and study visits. The key issue is how they are organised to enable 'deeper.learning' and trust building.** Study visits and meetings can be an efficient way to learn from other regions and build strategic partnerships when planned well. For the development of interregional S3, it is especially important to invest in attracting and involving stakeholders, especially representatives of the industry sector.

The value of the good-practice exchange in Interreg projects appears **largely dependent on the components and design of the project consortia and activities.** The most successful exchanges emerged where the selection of project partners was reasonably justified and where partners could identify from the start, a common challenge/opportunity/ need for which they wanted to develop an innovative solu-

tion. A key factor was also the capability or competence to exercise influence with the developed solution. Therefore, regions with effective governance mechanisms, skilled human resources in project design and sufficient autonomy for innovation-based decision-making stand to benefit more from S3 project learning. For example the success of the 'RDI2Club' project of Central Finland and 'BIOREGIO' project of Päijät-Häme were based on carefully selected partnerships that included regions strong in bio- and circular economy. **This enabled the development of S3-related European networks during the projects.** RDI2Club created a digital platform - Biobord - including data concerning major bioeconomy actors to serve as a platform for the BSR bioeconomy network and related project development.

'GoSmart BSR' project created a methodology - Trans-S3 - to help identify shared S3 areas beyond the RIS3 and expand the focus to groups of regions in different countries. The GoSmart BSR approach is fully based on information provided by stakeholders - mainly the business sector. RIS3 is used primarily as a framework. The extension stage project 'GoSmart&Excel BSR' aims to produce a transnational S3 document for the BSR that will support regions and regional actors in prioritising common actions.

Table 2. Summary of the S3 Interreg projects included in this study and their key outputs.

Project	Key output	Description
RDI2Club	Biobord Platform	Digital platform that connects bioeconomy public, business and research actors in the BSR. Supports RIS3 implementation and interregional cooperation in the long term.
GoSmart BSR	Trans-S3 methodology	A tool for identifying interregional shared/complementary S3 areas and economic actors with mutual interests
Smart-Up BSR	Interregional innovation camp	Enables experts from different countries to come together and find concrete solutions to common challenges. Requires good preparation and relevant facilitation skills.
ClusterFY	Recommendations to improve European cluster policies	Finding ways to enhance cooperation between European clusters and business networks
EmpInno	Recommendations for managing authorities on how to increase business involvement in RIS3	Joint workshops with managing authorities and business development organisations. Thematic interregional business matchmaking trips in selected S3 areas
S34Growth	Recommendations to facilitate interregional industry-led investments	Demonstration projects and action plans related to e.g. interregional innovation vouchers and ERDF-funded parallel projects in different regions. The activities continue in the Vanguard Network
BIOREGIO	Action plans towards Bio-based circular economy	Learning from other regions with related S3 priorities and development of action plans related to selected S3 area to support the RIS3 implementation
BSR Stars S3	Developing innovation ecosystems within circular economy	Well-prepared and focused study visits and stakeholder engagement within circular economy
LARS	Triple-helix gap analysis	Methodology to identify deficiencies and good cases of innovation ecosystems to support regional S3

5. Conclusions: How can BSR regions further capitalise on their experiences from the regional S3 and S3 Interreg projects?

The regions interviewed for this study have - since 2014 - each adopted a unique approach to S3, which is influenced by their historical backgrounds, economic and cultural contexts as well as the status of their innovation policies. This study identified broadly three types of approaches to S3: methodological, policy-driven and structure-driven. This division **may help regions to identify better the reasons behind their approaches and related benefits and challenges.** In many cases, the regions have been able to learn and develop their original approaches further towards more efficient use of the Entrepreneurial Discovery Process - EDP.

The interviews show well that the S3 process from design, prioritisation and implementation to monitoring and decision-making is a learning process for the regions. The EDP is now better understood as a continuous interactive process to foster regional mechanisms capable of foreseeing and reacting to rapid changes. This requires tools and methods for continuous interaction with the stakeholders and ability to make adjustments during the S3 implementation. **This ability to renew is very critical especially in the post-Covid recovery context.** For example companies in many regions are forced to re-evaluate their connections to global supply chains in this new context.

Indeed, in responding to EU recovery from the global health pandemic and in taking forward commitments to energy transition (the EU's Green Deal) and digital transition, there is a need for regions to engage as wide a range of 'ground level' expertise as possible, in articulating their innovation investment priorities. **The post-2020 EDP should take much stronger account of EU priorities, since they are crucial to the 'repair and recovery' phases of all EU territories.**

It is evident that **creating the basis for strategic interregional S3 requires a successful EDP, good S3 governance, awareness of innovation ecosystems and sufficient flexibility to adapt to new developments at the regional level.** Clearly, regions differ in their ability to optimise their approaches in line with the above requirements. This has been noted also in a recent DG Regio report that recommends dif-ferentiated support to EU regions - depending on their levels of development and the specific challenges they face - to ensure they maximise value from working with S3.

Beyond the Thematic S3 Platform partnerships, there is rather limited evidence of EU regions adopting interregional approaches to S3 outside of time-dependent Interreg-projects. For the BSR, there is only a few regions who are actively engaged in this type of collaboration. One of the regions included in this study, Västerbotten - a Northern, sparsely populated region with innovation challenges similar to other sparsely populated Arctic areas - has actively sought out this type of cooperation with other Arctic regions. Another region, Central Finland has utilised Interreg-project funding for the building of bioeconomy thematic network in the BSR to support RIS3 implementation. The cases of Västerbotten and Central Finland indicate that **political motivation and commitment are the first steps to boost efforts towards interregional innovation investments.**

EU Interreg programmes can provide a space for experimentation, learning and generation of good practices in S3 that can serve broader purposes. Going deeper with interregional S3 (with the support of the proposed I3 mechanism) is about going beyond learning and encouraging the set-up of specific innovation investment actions (e.g. jointly funding innovation equipment, infrastructures, training and learning and jointly investing in companies to spearhead the creation of new products and services). **This type of effort requires political commitment, long-term partnerships and trust building beyond single project life-time.**

There is a significant need to improve capacities across EU regions to embrace the new strategic interregional approach to S3. However, the Interreg S3 projects have provided 1) experiences from cooperating with regions with related S3 priorities, 2) various methods related to identifying partners with mutual or complementary needs and interests 3) practices that support longer-term partnership- and trust building. These experiences are valuable in the further development of post-2020 smart specialisation.

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Annex
LIST OF ORGANISATIONS AND THEIR REPRESENTATIVES INTERVIEWED FOR THIS STUDY

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